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UNIVERSITY OF ALBERTA

AN INQUIRING MIND: PROBLEMS AND PROSPECTS OF ITS DEVELOPMENT

BY

FREDERICK EDWARD MBEO

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF

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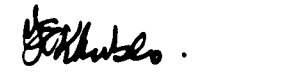
Author's Signature: 

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FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommended to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled AN INQUIRING MIND: PROBLEMS AND PROSPECTS OF ITS DEVELOPMENT submitted by FREDERICK EDWARD MBEO in partial fulfillment of the requirements for the degree of DOCTOR OF PHILOSOPHY.

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October 25th, 1993.

This thesis is most affectionately dedicated

to

My father Edward Bingilelo [illegible]

and

My mother Steria Kokushobowakerwa

ABSTRACT

The policy of Education for Self-Reliance (ESR) was introduced in Tanzania in 1967 to guide the efforts of designing a liberating and empowering education that would enable Tanzanians to think in an inquiring manner, autonomously, and democratically. The policy called for fostering of an inquiring mind.

The intents of this study were to assess the extent to which Tanzania's secondary schools had reached the inquiry goal, address the factors that influenced the realization of this goal, and explore the possibilities for achieving it more fully. The problems of "definition" and "development" of an inquiring mind were addressed in order to establish the conceptual framework to guide the study.

The research methodology employed was intended to permit both the researcher and the participants to conduct an investigative dialogue in order to reveal the reasons and meanings held by them on the aspects under study. For this reason, interviews were used as the primary method of collecting data. Classroom observations, analysis of documents, informal observations, and my personal experiences were used to provide for triangulation. Data analysis was performed qualitatively. The participants included secondary school teachers, pupils, heads of secondary schools, teacher educators, examination officers, curriculum developers, school inspectors, and senior educational administrators.

The study found that, despite several reforms to revitalize education in Tanzania since 1967, the goal to develop an inquiring mind had neither been adequately understood nor researched about in order to unpack the concept and explore the avenues for fostering it. Consequently, the goal had been inadequately realized in teaching and learning.

The study also found that a complex web of factors had made it difficult for Tanzania to reach the goal of developing an inquiring mind not only in secondary schools but also in other educational institutions. The study suggested that this complex, unsupportive context notwithstanding, it was possible to look for a "room for maneuver" and work towards fostering an inquiring mind. More efforts needed to be made to further explore relevant "language of critique" and "language of possibility" in order to achieve this crucial goal.

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Frederick E. Mbeo

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LIST OF ABBREVIATIONS

A-level	= Advanced Level
ACSEE	= Advanced Certificate of Secondary Education Examination
AD	= Arusha Declaration
APSP	= African Primary Science Project
BA Ed	= Bachelor of Arts with Education
B.Sc. Ed	= Bachelor of Science with Education
BTP	= Block Teaching Practice
CA	= Continuous Assessment
CCM	= Chama Cha Mapinduzi
CSE	= Certificate of Secondary Education
CSEE	= Certificate of Secondary Education Examination
DANIDA	= Danish International Development Agency
EAC	= East African Community
EACSO	= East African Common Services Organization
EAEC	= East African Examinations Council
EAEMP	= East Africa Entebbe Mathematics Program
ESR	= Education for Self-Reliance
FE	= Final Examination
GCE	= General Certificate of Education
GNP	= Gross National Product
ICB	= International Competitive Bidding
ICD	= Institute of Curriculum Development
IDA	= International Development Agency
IMF	= International Monetary Fund
LCB	= Local Competitive Bidding
MANTEP	= Institute of Management Training for Education Personnel
MOEC	= Ministry of Education and Culture
NEC	= National Executive Committee

NECTA = National Examinations Council of Tanzania

NF2E = National Form 2 Examination

NGO = Non-Governmental Organizations

O-level = Ordinary Level

RDDA = Research, Development, Diffusion and Adoption

RSA = Royal Society of Arts

SEDU = School Equipment Development Unit

SEPA = Science Education Program for Africa

SIDA = Swedish International Development Agency

SLTP = Single Lesson Teaching Practice

SMEA = School Mathematics of East Africa

SMP = School Mathematics Project

SMPEA = School Mathematics Project for East Africa

SMSG = School Mathematics Study Group

SSCE = Secondary School Certificate of Education

SSP = School Science Project

TANU = Tanganyika African National Union

TES = Tanzania Elimu Supplies Ltd.

TPCU = Textbook Production Coordinating Unit

TRC = Teachers' Resource Centers

UNESCO = United Nations Educational, Scientific, and Cultural Organization

UNDP = United Nations Development Program

UPE = Universal Primary Education

CHAPTER ONE

INTRODUCTION

INTRODUCTION

This chapter looks at the background to the goal of developing an inquiring mind, the need and purpose of the study and the statement of the problem. It also discusses the significance, delimitations, limitations and assumptions of the study and definitions of some terms used in the study.

BACKGROUND TO THE GOAL OF DEVELOPING AN INQUIRING MIND

The Republic of Tanzania is located in East Africa. It achieved its independence from Britain in 1961. Attempts to change the educational system in this country have been made since this date. However, a major step was undertaken in 1967 with the introduction of the policy of "Education for Self-Reliance" (ESR). The policy established the aims of education for Tanzanian society and called for an educational revolution. The government of Tanzania (Ministry of Education, 1984b) endorsed this policy as a guiding principle for educational deliberations in the country until the year 2000. Government officials (Ministry of Education and Culture, 1991a) and educators (Mosha, 1992) have expressed the need for the development of curricula consistent with the goals of this policy.

One of the central goals of this policy was to enable Tanzanians to develop and receive an empowering and liberating education that would enable them to think and act in an inquiring manner, autonomously and democratically. ESR required that learners at all levels of education had to "learn by doing" (Nyerere, 1968 p. 284). The people of Tanzania should not be "robots who work hard but never question what the leaders are doing or saying" or "who simply carry out plans or directions received from above" (Nyerere, 1968 p. 274). Education must produce citizens who "have to think for themselves, to make judgments on all the issues affecting them; they have to be able to integrate the decisions made through the democratic institutions of our society" (Nyerere, 1968 p. 274).

ESR policy states that "the educational system of Tanzania would not be serving the interests of a democratic society if it tried to stop people from thinking about the teaching, policies or the beliefs of leaders, either past or present. Only free people conscious of their worth and their equality can build a free society" (Nyerere, 1968 p. 275). Consequently, the educational system,

> should develop in each citizen three things: an enquiring mind; an ability to learn from what others do, and adopt it to his own needs; and a basic confidence in his own position (Nyerere, 2968 p. 274).

The policy called for the interface of education and work so that learners would integrate theory with practice. This policy, therefore, was an explicit demand to design an educational system with the central focus to foster *an inquiring mind.*

NEED FOR THE STUDY

Studies conducted in Tanzania indicate that despite the existence of the goal to develop an inquiring mind since 1967, teaching and learning have continued to be of the

"banking" (Freire, 1970) type mostly using lectures, authoritative presentations, and other expository methods. For example, at secondary school level, Mbise (1979) observed the different roles teachers and students played in the teaching and learning in political education. This study showed that instruction was still teacher-centered. A study by Mlekwa (1977), on the teaching of the English language, and by Nabudere (1978), who studied the problems of teaching and learning physics, revealed that the lecture and other traditional methods of exposition still dominated the instructional scene in secondary schools. Chonjo's (1980) study on the teaching and learning of chemistry and Elietinize's (1981) study on the problems of teaching political education revealed the same findings.

The instructional situation in primary schools and teacher education colleges was not different. Studies conducted in these educational institutions (Dubbeldam, 1970; Besha, 1977; Moshi, 1977; Lisso, 1979; Bandeke, 1983; Kessi, 1985; Kotta, 1986) indicate that "spoon-feeding" methods were being used at both levels.

These studies prompt one to ask: *Why has the goal of developing an inquiring mind not been realized despite efforts to translate ESR policy into practice since 1967?* We need to know the reasons which have influenced fostering of this goal and to think about how it may be reached. In particular, we need to know what an *inquiring mind* and its *development* mean if we have to design appropriate programs to foster it.

PURPOSE OF THE STUDY

The purpose of this study is to assess the extent to which Tanzania's secondary schools have reached the goal of developing an inquiring mind, address the factors that may have influenced the realization of this goal, and explore the possibilities for enabling secondary schools to achieve the goal more fully. The study intends to address the problems of "definition" and "development" of an inquiring mind in order to establish the conceptual framework to guide the study, the bases for assessing the extant teaching and learning situation, and the factors involved.

STATEMENT OF THE PROBLEM

This study addresses the following general question: *To what extent has the goal of developing an inquiring mind been reached in Tanzanian secondary schools and how can it be achieved more fully?* Specifically, the study addresses the following questions:

1. What does it mean to have an inquiring mind?
2. What does it mean to develop an inquiring mind ? How can it be developed?
3. To what extent has the goal of developing an inquiring mind been adopted as a foundational touchstone in teaching and learning in Tanzanian secondary schools?
4. What factors have influenced the reaching of the goal of developing an inquiring mind in these schools?
5. What can possibly be done to reach the goal of developing an inquiring mind?

SIGNIFICANCE OF THE STUDY

This study tries to address a key policy issue of Tanzania's educational system. One crucial belief underlying the goal to foster an inquiring mind is that education is a major vehicle to develop the country's economy and eradicate poverty, ignorance and disease. To achieve these goals, the educational system has to enable the citizens to become active, investigative, reflective, flexible, free-thinking, imaginative and innovative people who cherish and enjoy autonomy and democracy.

The findings of this study may be helpful in the designing and offering of such empowering education. Hopefully, the study will help teachers, teacher educators, student teachers, policy makers, curriculum developers, evaluators, researchers and others interested in this field to find appropriate ways and means to foster an inquiring mind. Indeed, the study is historically timely. Currently educators in Tanzania and in various fields of teaching and learning throughout the world are concerned about the promotion of *thinking* in educational institutions and the nurturing of reflective practitioners and learners. This study may contribute to better understanding of the issues and problems involved in the reaching of this goal.

DELIMITATIONS

Social science subjects taught in Tanzania's secondary schools included history, geography, economics, and political education. This study was delimited to teachers who studied geography as their teaching subject and pupils who studied it. Although these participants also gave insight about other subjects they taught and learned, the emphasis was on geography. The study was delimited to geography because, besides being my major teaching subject, it was taught at O-level in secondary schools as both a social and physical subject. This choice made it easier for me to sample the participants, understand their responses, and analyze relevant documents and classroom observations.

The study was delimited to teachers who had attended preservice and inservice teacher education courses offered in Tanzanian teacher education institutions. My interest was to assess the extent to which these programs promoted an inquiring mind.

Only pupils and teachers from public secondary schools, education administrators, and teacher educators in mainland Tanzania were included in the study. Zanzibar was excluded because its educational system differs from that of mainland Tanzania. As a result, the study was delimited to educational administrators and teacher educators from Tanzania mainland.

LIMITATIONS

Due to shortage of graduate teachers, most participants were diploma teachers. Another limitation was that some teachers were novices who had taught for only a year or two and thus had limited teaching experience and understanding of the context of the school. Due to problems of communicating in English language, interviews with most teachers, all pupils and some heads of schools were conducted in the Kiswahili language. These interviews were later translated into English by the researcher with some assistance from translators in the National Kiswahili Council of Tanzania. This process of translation may have distorted the original meanings intended by the participants. Since the study involved very few participants of various categories, and thus the findings are context-specific, generalizations in the traditional sense will have to be made with caution.

ASSUMPTIONS

It is assumed that the participants who were interviewed were in the position to provide appropriate and authentic information for assessment of the extent of fostering of the goal of promoting an inquiring mind. Because some of the information was obtained from various documents and classroom and other observations, it is assumed that these sources provided appropriate information for the study. It is assumed that the methodology used to collect and analyze the data captured the needed information. It is also assumed that, limitations notwithstanding, the interpretations of the data made in the study reflect valid and reliable meanings and findings from these sources.

DEFINITIONS OF TERMS

The following terms used in this study are defined below. Other terms are defined in the text where they are used.

Administrators: Officials doing administrative tasks or managing educational matters in various offices and educational centers such as the headquarters of the MOEC, ICD, NECTA, schools, and teacher education institutions.

Curriculum Developers: Persons responsible for designing school and teacher education curricula. In Tanzania the ICD is responsible for developing the curricula for schools and teachers colleges. The University develops its own curricula.

Diploma Teachers: Teachers holding a diploma certificate from teachers colleges which offer a program for the Diploma in Education.

Educators: Classroom teachers teaching in primary and secondary schools and teacher educators teaching in teacher education institutions.

Graduate Teachers: Teachers holding a university degree.

Headmasters/Headmistresses: The heads of secondary schools.

Primary Education: The first seven years of schooling. Children proceed from Standard 1 to Standard 7.

Principals: The heads of teachers colleges.

Program: Program is used synonymously with "curriculum" and is defined as an intended and unintended action using selected resources directed towards desired ends.

Pupils: Children studying in primary or secondary schools.

Secondary Education: The six years of schooling after primary education. Ordinary secondary school education (O-level) takes four years (Forms 1-4) after primary education. Advanced secondary school education (A-level) takes two years (Forms 5-6) after the O-level.

Students: Learners studying in schools, colleges, or university.

Teacher Educators: Tutors or lecturers and others in the university who teach student teachers.

Teacher Education Institutions: In Tanzania teacher education institutions include teachers colleges and the Faculty of Education of the University of Dar-es-Salaam.

Teachers Colleges: The institutions which prepare teachers other than the university. Graduates of these colleges are Grade "B" and Grade "A" teachers who teach in primary schools and diploma teachers who teach in secondary schools, teachers colleges, or adult education institutions.

Tutors: Teacher educators teaching in teachers colleges.

SUMMARY

In this chapter an introduction of this study has been presented. It has been shown that the focus of this study is to assess the extent to which Tanzania's goal of developing an inquiring mind has been achieved, and to explore the possibilities for reaching it more fully in Tanzania's secondary schools. Specifically the chapter has looked at the background to the goal of developing an inquiring mind, the need and purpose of the study, the statement of the problem, and the significance, delimitations, limitations and assumptions of the study. Some terms used in this study have been defined.

Chapter two addresses the problem of defining the concept of "an inquiring mind." The purpose of this chapter is to assess the issues and problems involved in establishing the elements that may help to understand the nature of an inquiring mind. Chapter three explores the meaning of "the development of an inquiring mind." It particularly examines the paradigms that are likely to influence the efforts of preparing a teacher and teacher educator who is likely to foster an inquiring mind. While chapter four looks at the research methodology used in this study, chapter five assesses the teaching and learning situation that existed in the Tanzanian secondary school classrooms at the time of field research. Chapters six, seven, eight, and nine focus on the factors that have influenced the development of an inquiring mind. The factors related to curriculum development and implementation are assessed in chapter six. While the factors related to teacher education are explored in chapter seven, those factors related to educational evaluation are addressed in chapter eight. The social, economic, political, and cultural factors are the focus of chapter nine. Chapter ten forms the conclusion of the study and explores the "language of possibility" for reaching the inquiry goal more fully.

CHAPTER TWO

AN INQUIRING MIND: PROBLEM OF DEFINITION

INTRODUCTION

The policy of ESR in which the development of an inquiring mind was articulated as a key educational vision for Tanzanian educational system did not attempt to define this concept. Some Tanzanian educators have seen this as a weakness of this policy (Mosha, 1990). A policy, however, provides a general philosophical orientation, and should not provide specific models and definitions of concepts and issues embedded in it. It was and still is expected that efforts would be made by the educational community to pursue the policy further in light of the changing realities of Tanzanian society and educational phenomena locally and internationally. The need to review in detail the meanings and demands of the goals of the policy of ESR was still the concern of educators and educational leadership (Ministry of Education and Culture, 1991a).

This chapter attempts to address the problem of defining the concept of an inquiring mind. The basic question tackled is: *What does it mean to have an inquiring mind?* or, in other words, *What does it mean to inquire?* Four sources of insights into the nature of an inquiring mind are identified from Tanzanian teacher education curricula and explored. These four areas which constitute the framework of this chapter include the *behavioral tradition*, the *cognitive tradition*, the *cognitive developmental tradition* and the *philosophical perspective*. A review of each of these areas is made in order to highlight the issues and problems involved in establishing the *elements* that may be the basis for understanding and developing an inquiring mind.

INSIGHTS FROM EDUCATION CURRICULA

One way to get the sources of insight into the nature of an inquiring mind is to analyze Tanzania's teacher education curricula in order to identify psychological and philosophical orientations which might be the basis for defining this concept. This may be done by looking at the content of these curricula in order to identify psychologists, philosophers and educators whose ideas constitute the basis of the underlying curricula's orientations. Responses by participants are another additional source of such insights.

The analysis that follows relies heavily on the curriculum for diploma teacher education course and participant responses. Unfortunately it was not possible to secure specific course outlines for the undergraduate courses offered in the Faculty of Education. The only available description of these courses was that provided in the university's prospectuses (University of Dar-es-Salaam, 1987; 1992).

These sources reveal that three branches of educational psychology were included in Tanzania's teacher education curricula. These branches included behavioral *psychology* based on the ideas of B. F. Skinner, *cognitive-developmental psychology* with emphasis on J. Piaget's work, and *cognitive psychology* featuring the work of Benjamin Bloom, Hilda Taba, Jerome Bruner and other cognitive psychologists.

Another area of education curricula from which insights on the nature of an inquiring mind may be got is the field of *educational philosophy*. The curricula included topics and names of educational philosophers to be studied. A complete list of these names

included in the Diploma curriculum are: "Plato, Pestalozzi, Chaka, Jabavu, Aggrey, Fanunwa, Sekeou Toure, KimLi Sung, Mao-Tsetung, Montessori, Piaget, Shaban Robert, Nkurumah, M. Ghandhi, R. Tagore, Nyerere, Freire, J. Dewey, Sigmond Freud, and Rousseau." (Ministry of Education, 1980, p. 12). Advocacy of 'subject specialists' on "discipline-oriented" methods of investigation also served as a source of ideas on the nature of an inquiring mind. Such specialists claim that each discipline is characterized by a particular method of investigation or "disciplined inquiry." The geography syllabus for diploma course, for example, included a section on practical geography and research methodology seen as most relevant to geographic studies. Chipa (1980) suggests the adoption of "scientific method" along with all experimental designs in educational studies.

This brief survey helps to relate and contextualize the discussion that is to follow in Tanzanian's educational context, and highlights major areas of concern that will be dealt with. From this overview a more detailed review on the nature of an inquiring mind is now attempted by looking at the views in the three branches of psychology and in philosophy.

BEHAVIORAL TRADITION

Behaviorism, also identified by Nuthall and Snook (1973) as "behavior-control" or "behavior-modification" is a psychological tradition usually attributed to Skinner (1948; 1953; 1954; 1957; 1968; 1971) as its founder. Behaviorism arose from the attempt to apply the framework of *behavioral psychology* to the classroom, and generally it might be called the "stimulus-response" (S-R) model of teaching and learning. This theory emphasizes the reinforcement (reward) of correct responses and stimulus-response associations. The approach is called *behaviorism* because the focus is on the visible behavior itself, rather than the unseen mental events that control the behavior.

Associationist Tradition

The beginnings of behaviorism seem to relate to associationist psychology which itself is a very old tradition. Gagne (1985, p. 5) finds that *associationism* derives from nineteenth-century British associationist psychologists who believed that learning depended upon *association* of mental events. According to this view, learning occurs when the coincidence of, say, the sound of a melody continues to "remind" us of the singer. Associationists believed that acquiring a new idea necessitated (1) *contiguity* (close association) of the sense impressions or simple ideas that were to be combined to form the new ideas, and (2) *repetition* of these contiguous events. Some of these psychologists also discussed "mental concentrations" (which is now usually called attention) as an important condition for learning new ideas by association.

Dacey (1989), however, observes that associationism is much older. He finds that "Plato (in the *Phaedo*) and Aristotle (in the essay "Memory") might be considered the earliest associationists. Aristotle developed the primary laws of association: *similarity, contrast,* and *contiguity.*" Charles E. Skinner (1945, p. 219) calls these components of associationism as "three laws of learning [which] are related to the so-called 'secondary laws of learning' formulated by Thorndike. These are the laws of *recency, vividness,* and *frequency*" (p. 219). Indeed, C. E. Skinner identifies five steps of associational learning: *sensation, strengthening of the association or connection, memory or duration, modification and extension of the association, and diminution of earlier associations.* Gagne (1985, p. 6) notes that the American psychologists like William James and John Dewey added some distinctly new interpretations to the associationist tradition. The most significant contribution was that they assigned a critical role to *action* as a factor in learning. Action did not simply follow ideas but became an essential feature to the process of

learning. However, the associationist tradition has maintained the formulation of "associations" as inferred links between the stimulus situation and the response (Robinson, 1932). These links were also called "connections" and "bonds." According to Gagne (1985) this conception of associations has persisted to the present day. The association is usually considered the simplest form of entity that is learned, under the conditions of contiguity and repetition.

Trial-and-Error Learning

Dacey (1989) finds that the theory of *associationism* is based on the belief that ideas "come not from carefully laid out mental plans but from a series of trial-and-error efforts to solve a problem" (p. 79). Thus associationist tradition is associated with trial-and-error learning, a trend which was pioneered by Edward L. Thorndike (1898) by conducting scientifically controlled experiments on learning of animals (Gagne, 1985; Gage and Berliner, 1984). Thorndike's experiments which involved placing hungry animals in a box and having them search for food (stimulus) by trial and error behaviors (responses) suggested that all that was necessary to explain animal learning were specific bonds between "sense impressions" and "impulses to action." These associations he considered to be stamped in by the consequences resulting from the completed act (such as escape from the problem box). Thorndike believed that these associations also made up a large part of what human beings learned and remembered. He called his theory of trial-and -error learning the *law of effect*. Similar experiments using animals were conducted by the Russian psychologist Ivan Pavlov (1927) which resulted in the formulation of the theory of *classical conditioning* of responses, and notion such as "respondent learning" based on the concepts of "unconditioned" and "conditioned" stimulus and response (Gage and Berliner, 1984 pp. 254-258).

Operant Conditioning

Dacey (1989) finds that B. F. Skinner is currently the most famous representative of the associationist school of thought. Thorndike's "trial-and-error" learning situation does not differ in basic characteristics from that of the rat pressing a lever, employed later by Skinner (1938) in Skinner box. Indeed, Skinner's notion of "operant conditioning" was an extension of Thondike's experiments. "Reinforcement" is the term Skinner uses to identify the events that Thorndike called the "Law of Effect" (Gagne, 1965 p. 11) and Skinner (1968, p. 10) himself confirms the borrowing of this idea. As observed earlier, he also borrows from Aristotle's three laws of association, and John Lock's concept of *tabula rasa* (which means blank tablet), a belief that, at birth, the mind contains nothing, and Herbert Spencer's ideas about the inheritability of association from one generation to the next, though wrong, which at one time proved influential (Dacey, 1989, p. 80).

Reinforcement refers in general to the effects made upon learning by its consequences. According to operant learning, behavior that has as its consequence some reinforcing event is strengthened. Behavior that is reinforced has a tendency to increase in frequency, magnitude or probability of occurrence (Gage and Berliner, 1984 p. 260). Reinforcement has more recently taken on several different meanings (Gagne, 1985, p. 8); consequently, Skinner's advocacy is here pursued. To Skinner (1968; 1969), reinforcement means a particular arrangement of stimulus and response conditions that bring about the learning of a new association. Specifically, a response that one wants the individual to learn must be made *contingent* on (dependent on) the occurrence of certain stimulus conditions, which in turn bring about another response. Skinner writes:

> Once we have arranged the particular type of consequence called reinforcement, our techniques permit us to shape the behavior of any organism almost at will ... Extremely complex performances may be reached through successive stages in the shaping process, the contingent of reinforcement being changed progressively in the direction of the required behavior ... Reinforcements continue to be important, of course, long after an organism has learned *how* to do something, long after it has acquired behavior. They are necessary to maintain the behavior in strength (Skinner, 1968 p. 10).

Such learning as a result of reinforcement has been widely applied in the *technology* of behavior modification and behavior control. According to Skinner (1982a), the goal of this "scientific psychology" is the prediction and control of human behavior. Such empirical psychology, hence, should focus on the relation between manipulable environmental variables and overt behavior that can be quantified.

Skinner (1982a) argues that in the case of learning, and any modification of a response which increases the probability of its occurring constituted learning, reference to mental states or events is not necessary for developing scientific laws liking behavior to environmental contingencies. In our prescientific description of human responses to complex environments, we might use terms like "thinking" and "expecting," but they would disappear as scientific knowledge of patterns of reinforcement accumulated. According to Skinner not only were such ascriptions unnecessary, they were detrimental:

> Theories - whether neural, mental, or conceptual - talk about intervening steps in these relationships. But instead of prompting us to search for and explore relevant variables, they frequently have the opposite effect. When we attribute behavior to a neural or mental event, real or conceptual, we are likely to forget that we still have the task of accounting for the neural or mental event (Skinner, 1982a, p. 44).

Moreover, "a preoccupation with mental way stations burdens a science of behavior with all the problems raised by the limitations and inaccuracies of self-descriptive repertoires." (Skinner, 1982b p. 129).

Thus Skinner and other protagonists of behaviorism hinge problem-solving on operant conditioning and not on thinking *per se*. Indeed, Schrag (1988) finds that "behaviorism eliminates the concept of thinking entirely from its vocabulary. Learning, which is to say the principles of conditioning, could theoretically account for the most complex performance" (p. 56). Skinner would claim that if we knew the reinforcement history of subjects we could predict their problem-solving behavior precisely. He views human problem-solving as mindless trial-and-error process observed in hungry animals in his box; it is doing without intentional, thoughtful action: thoughtless doing intended to shape human behavior without their conscious choice or will to do so (Skinner, 1954; 1984).

Skinner's (1971) view of *creativity* illustrates this observation further. He argues that there is no such a thing as creativity. He also argues that human beings have no freedom, since all of our behavior is controlled by those who dispense reinforcements and punishments (parents, teachers, peers, police and others who enforce laws, traditions, customs, mores, social expectation, etc.). Nor should we accept the dignity which comes from personal accomplishment, since again those achievements were determined by our history of reward and punishments (Davis, 1986, p. 25).

According to Skinner (Davis, 1986, p. 26), the behavior of a creative person such as a poet is "merely the product of his genetic and environmental history." The act of composing a poem out of "bits and pieces" is not an act of creativity, since in the experience of the poet he or she "had to learn how to put them together." In behavioristic terms, "the behavior [response] ... was ... triggered by the environment [stimulus] ... [and] ... the consequences [reward] may strengthen his tendencies to act in the same way again." While creating a poem may indeed require exploration and discovery, these are tied to the reinforcement history of the poet and to trial-and-error learning activities.

Since the poet is not aware of all of his or her history, he or she does not know where the poetic idea (behavior) comes from. Therefore, the poet erroneously attributes his or her own creations to a creative mind, an unconscious mind, or perhaps "to a muse, ... whom he has invoked to come and write his poet for him." Even Shakespeare is given little credit for his own works since, "possibly all their parts could be traced by an omniscient scholar to Shakespeare's verbal and nonverbal histories." Shakespeare himself merely put the bits and pieces together in a fashion which produced rewarding consequences. Similar views are advanced in studies by Irving Maltzman, Arthur Staats and Sarnoff Mednick (Davis, 1986, pp. 26-27).

One assumption underlying behaviorism is that there is only one type of learning and one way of knowing. This single way is based on one-to-one specific transfer of training and is seen as an objective, technical matter. This shortcoming was partly noted and challenged as early as behaviorism was being developed and popularized. Stolurow (1965), for example, noted that the one-to-one stimulus-response (S-R) conception was inadequate for many "training" tasks. Many-to-one, one-to-many and many-to-many relationships were more likely to be involved. Further, to assume that the connection between "stimulus" and "response" was always some kind of meaningless bond oversimplified the logic found in most subject matter (Nuthall and Snook, 1973 p. 57).

Dewey was among the educators who questioned the use of S-R bond in education from the beginning of behaviorism. Dewey (1929) wrote:

> The stimulus-response psychology in the form in which it prevails at the present time ... tends to be interpreted in a way that isolates a particular narrow part of it, based on the mechanisms of reflex actions, from the general course of biological development. Then the idea of the bond that connects stimulus and response is taken to be of a hard and fast performed character, instead of a flexible and functional one. In addition, the place of any particular S-R bond in the entire system of behavior is overlooked, or else the whole system is reduced to an algebraic summation of original fixed, isolated units. The important activities of the sympathetic nervous system, and the fact that even the reflexes function in the service of needs of the whole system is overlooked. Moreover, particular S-R connections interpreted on the basis of isolated reflexes, are viewed as static cross-sections, and the factor most important in education, namely, the longitudinal, the temporal span of growth and change is neglected (pp. 67-68).

Gagne's book, The Conditions of Learning (Gagne, 1965, 1985), was an attempt to expand the concept of learning outside the narrow confines of a simplistic S-R interpretation. In fact, at first, Gagne (1965) questioned the applicability of trial-and-error to human learning:

> Is the animal trial-and-error prototype representative of human learning? The answer is clearly no. It is, in fact, rather difficult to relate this prototype to learning that might occur in a human being. If human beings are put in a problem box, we know that they are likely to adopt a strategy of searching for a way out. They recognize latches, knobs, or other devices as having certain functions. They think out the consequences of their actions before they take them and choose the most likely alternative. Once they find their way out they are likely to remember the method immediately, and there will be no gradual error reduction or subsequent trials (p. 7).

As a result of this stance, Gagne took "learning tasks" that had interested various experimental psychologists and developed them as hierarchically ordered *classes of behavior* or *learning types*. His taxonomy (Gagne, 1985; Gage and Berliner, 1984) includes (1) signal learning; (2) stimulus-response learning; (3) chaining; (4) verbal associations; (5) multiple-discrimination learning; (6) concept learning; (7) principle learning; and (8) problem-solving as the most complex learning type.

However, while Gagne's analysis of learning introduces a considerable complexity to the behavior-control model, it remains tied to the major conceptual concerns of psychologists in the area of behaviorism. "Gagne still emphasizes that the task of the teacher is the *management* of learning. The nature of this management is largely self-evident in situations where desired student behaviors and kinds of learning have been adequately defined in the terminology of behavioral science" (Nuthall and Snook, 1973, p. 57). In fact, later Gagne (1985), who had criticized trial-and-error learning, supports strongly the behavioral school when he states:

> the law of effect - the principle of reinforcement - is a dependable and powerful generalization about human learning. Many kinds of behavior categories are learned without conscious attention on the part of the learner ... Despite its origins in studies of animal learning, the partially accidental (trial-and error) nature of learning is equally characteristic of much of the learning done by humans. So too is its quality of being affected by its consequences, which is the essential meaning of the law of effect...Thus, the most important discovery of trial-and-error learning is now best described as reinforcement theory (Gagne, 1985, p. 8).

Gagne seems to be ambivalent about his position on "conscious" and "unconscious" learning; "thinking" and "non-thinking" activity; and "routine" and "thoughtful" action. Such ambivalence is not uncommon among behavioral and other psychologists who try to reconcile the two positions without trying to understand their underlying assumptions.

Another shift in thinking made by Gagne which is relevant to this discussion relates to Bruner's (Bruner, Goodnow and Austin, 1956) notion of "cognitive strategies." At first Gagne rejected the teaching of these strategies in favor of "content principles" of "dealing with content knowledge of the topic being learned" (Gagne, 1965); he states:

> If strategies were deliberately taught, would not this produce people who could then bring to bear superior problem-solving capabilities to any new situations? It is exceedingly doubtful that they can be brought about by teaching students "strategies" or "styles" of thinking. Even if these could be taught.... they would not provide the individual with the basic firmament of thought, which is subject-matter knowledge. Knowing a set of strategies is not all that is required for thinking; it is

> not even a substantial part of what is needed. To be an effective problem solver, the individual must somehow have acquired masses of structurally organized knowledge. Such knowledge is made up of content principles, not heuristic ones (p. 70).

Later, however, Gagne (1985) embraced this notion of "cognitive strategies of thinking." He now believed that

> one important kind of capability learned by human beings is called a *cognitive strategy*. These are the skills by means of which learners regulate their own internal processes of attending, learning, remembering, and thinking. These internally organized skills have been given different names by various authors. Bruner (1971) refers to them as "cognitive strategies," which he relates primarily to processes used in finding and solving novel problems ... They are called 'executive control processes' (Gagne, 1985 p. 55).

Gagne, then, defines "the nature of problem-solving" in terms of "three kinds of learner capabilities," cognitive strategies being one of them; the other two are *intellectual skills* and *organized verbal information*. Note also Gagne's belief in the development of problem-solving capabilities through teaching "masses of structurally organized subject-matter knowledge." In other words, Gagne promotes a belief in academic rationalism.

In terms of understanding the nature of an inquiring mind, behaviorism seems to offer nothing beyond its S-R model. In this conception, problem-solving is viewed as a mechanical, technicalist operation of unconsciously shaping of the behavior of the learner. A learner (animal and human being as well) "solves" predetermined and highly structured "problems" in a highly controlled and manipulated settings. The "trial-and-error" operations the learner does involve very minimal or no thinking at all as they are automated responses performed by a desperate organism (a mere biological substance); all organisms used in experiments were hungry and the responses were "elicited" or "emitted" in a survival situation by a starving animal. In terms of Maslow's (1954) hierarchy of human needs, this kind of learning may satisfy physical and organizational basic needs, but not belonging, self-esteem and self-actualization needs which are part and parcel of the policy of education for self-reliance and the development of an inquiring mind.

The methods of teaching advocated by behaviorist educators are primarily those of *exposition* of knowledge and *rehearsing* and *drilling* technical skills, the methods most suited to the shaping, modifying and controlling human behavior. Thus drilling and *rote learning* on the part of the learner are recognized as legitimate and major processes of teaching and learning. Skinner (1968) actually advocates these methods:

> "Frequency theories" extend the notion of learning by doing. When one instance of a response makes no obvious difference, the teacher adds other instances. There are plausible analogies. If we spin the end of a stick against a stone, we may leave no mark, but if we spin it repeatedly, we drill a hole, and we *drill* our students in the same sense. A wheel passing over hard ground may leave no trace, but if it passes often enough, it leaves a *rut* or *route*, and this is the sense in which our students learn by *rote*. The teacher induces his student to *exercise* or *practice* so that his habits, like his muscles, will grow stronger with use (Skinner, 1968 p. 6) (italics in original text).

For Skinner this is what "learning by doing" means.

One traditional criticism of S-R model of behaviorism is that of oversimplification, or *reductionism.* Complex and intentional actions of human beings are reduced to principles of Pavlovian (classical) and Skinnerian (instrumental) conditioning. Much of the complexity of learning and mental life is lost in such reductionism. Behaviorism is opposed by cognitive psychologists who focus on the examination of internal processes in learning, thinking, memory, and other elements of inquiry unencumbered by a commitment to conditioning principles. It is to this branch of psychology we now turn.

COGNITIVE TRADITION

Gestalt Psychology

The opposition to the advocacy of behaviorism in education seems to have begun with the appearance of Gestalt psychologists who reacted against associationist ideas. These psychologists made experimental studies of complex thinking. Before the Second World War the Gestalt psychologists brought an interest in the empirical investigation of thinking from Germany to America. Pioneering work in this field was also done by F. Binet in France, J. Piaget in Switzerland, and F. Bartlett in England (Schrag, 1988 p. 40). Important early contributions in Gestalt psychology were made in America by Max Wertheimer (1945), Wolfgang Kohler (1929), Kurt Koffla (1929) and others.

One of the beliefs held by Gestalt psychologists is that the whole of any idea always amounts to more than merely the sum of it parts. From its beginning, Gestaltism has always been antithetical to associationism. Max Wertheimer (1945), for example, is one of the early associationism's strongest critics. Consider, for instance, this stinging indictment:

> In [the associationists'] aim to get at the elements of thinking they cut to pieces living thinking processes, deal with them blind to structure, assuming that the process is an aggregate, a sum of those elements. In dealing with processes, they can do nothing but dissect them, and thus show a dead picture stripped of all that is alive in them (p.12).

Wertheimer's central interest was in creativity and his theme is the formation and alteration of Gestalts, which means "mental patterns or forms" (Dacey, 1989 p. 91). The elements of Gestalts have complex relationships and are far more than merely "associated" with each other. Great paintings are made up of elements that are interrelated to the point that the whole is greater than the sum of the parts. Wertheimer argued that getting a new point of view on the whole of a problem, rather than rearranging its parts, is more likely to produce creativity.

Another key aspect of Gestalt theory is the concept of instantaneous *insight*, researched by Kohler (1925; 1929). He conducted experiments on insightful learning with chimpanzees in opposition to the emphasis by Thorndike on trial-and-error learning by other animals. This and other research was used to reinforce the Gestaltist contention that learning involves a reorganization or *restructuring* of mental concepts. Thus, those who adhere to the Gestalt point of view are also sometimes referred to as *structuralists* (Dacey, 1989, p. 93). Some psychologists find that the notion of *discovery method* arose from Kohler's experiments (Gage and Berliner, 1984, p. 268) and that it embraced structuralism (Bruner, 1971). Norman F. Maier's (1931) famous experiment with human beings, using two cords hanging from the ceiling in which subjects were asked to tie the ends together,

led him to conclude that neither "trial-and-error" nor association by similarity was able to explain the appearance of the solution.

Howard Gruber, a student of Piaget's and co-author with Wertheimer, tried to find flashes of insights from the notebooks of biologist Charles Darwin. Using a case study approach, Gruber (1981) tried a reconstruction of Darwin's thinking in order to discover the creative mental processes used by the mind of a genius. Schrag (1988) notes that "the focus on complex human mental processes links contemporary cognitive psychologists to the Gestalt school, yet the dominance of behaviorism ... has left its mark on the means by which such processes are investigated" (p. 40).

Cognitive Learning

As observed above, the basic contradiction between behavioral and cognitive psychology is that while the former focuses on overt behaviors, the latter is interested in the identification of *cognitive processes* which have also been given various names such as "thinking skills" or "operations." Cognitive psychologists and educators hold that none of the types of behavioral learning account for such learning. Cognitive processes entail insight, or thinking and using deductive and inductive logic. Although other conceptions of learning may be applicable to stimulus and response connections (to cues and behaviors) that are arbitrary and nonlogical, cognitive psychologists and educators say that something more is needed to describe and explain the learning of relationships that are logical, rational, or nonarbitrary. They thus believe that behavioral approaches ignore the learner's perception, insight into and cognition of the essential relationships between elements in the learning situation. These mental processes, ignored by behaviorists, are important in the learning theory of cognitive psychology and they are assumed to operate at both a conscious and an unconscious level (Gage and Berliner, 1984, p. 266).

Basic and Complex Processes

Several schemes have been used by cognitive psychologists to classify the cognitive processes. One of them is that suggested by Presseisen (1985) who makes a distinction between *basic* and *complex* thinking processes. The former are also called *micro-processes* and the latter *macro-processes.*

Basic Thinking Processes

There are numerous conceptualizations of basic thinking processes. Among the pioneering models of basic thinking processes include those by the founders of the current "cognitive thinking movement" (Pauker, 1987): Benjamin Bloom, Hilda Taba and Jerome Bruner. Bruner and his associates (Bruner, Goondnow and Austin, 1956) identified four phases of cognitive processes or "skills" involved in "discovery-oriented" learning. Phase one includes *presenting information* (the learner speculates about the concept). Phase two involves *analyzing strategies* (the learner determines how he or she is going to alter the concept). Phase three includes *analyzing concepts in written material or from conversation* (the learner reads and/or listens and then groups according to the concept). Phase four is *practicing* (the learner forms concepts and defends them).

As indicated earlier, Bruner and his associates, in their laboratory investigations, identified *cognitive strategies* (heuristics) or learning styles which the learners used to regulate or monitor their own internal processes of thinking and discovering. They found out that learners adopted several different kinds of strategies, which might be said to

characterize their "style" of solving the problem. Some of these strategies were relatively "conservative," in the sense that a wrong choice did not require starting all over again with a new hypothesis. Others were relatively "risky" in the sense that they jumped to a hypothesis before the evidence was complete. Bruner (1966) also contributed to the theory of cognitive growth which we will deal with under developmental psychology.

Taba (1967), in her model of "cognitive tasks," identifies three stages of problem solving. Stage one constitutes *concept formation* which involves observing, defining, identifying, grouping, and categorizing. Stage two involves *interpretation of data* which includes comparing, contrasting, inferring, and generalizing. Stage three constitutes *application of principles* which involves hypothesizing, explaining, predicting, and verifying predictions.

Of the cognitive psychologists, Bloom (1956) has likely had the most widespread effect on school cognitive processes instruction and educational evaluation. His taxonomy of educational objectives includes six categories of basic processes. The first is *knowledge*: recalling or locating of information. The second is *comprehension*: understanding and explanation of information. The third is *application*: using prior learning to solve a problem or to answer a question. The fourth includes *analysis*: seeing in-depth relationships between and among parts of the information. The fifth involves *synthesis*: creating new ideas by pulling parts of the information together. The sixth is *evaluation*: making judgments based on evidence.

Guilford (1986) proposed a model of "creative talents." His "structure of intelligence" (SOI), which for him constitutes a "frame of reference of creativity," includes five kinds of mental processes: *cognition, memory, divergent production, convergent production, and evaluation.* The products of these operations include *units, classes, relations, systems, transformations, and implications.* The kinds of content involved are *visual-figural, symbolic, semantic, and behavioral information* (about mental states of people) (Guilford, 1986 pp. 30-35). Guilford, whose work in creativity was due to his interest in *military* research, borrows ideas from various works of psychologists including behavior psychologists like Thorndike (1924).

Hill (1970, p. 308) synthesizes Taba's cognitive tasks and Gagne's learning tasks into a hierarchy of "inquiry processes" which include *observing, identifying categories, defining, comparing and contrasting, generalizing, predicting, verifying predictions, developing models, formulating hypotheses, testing hypotheses, and making decisions.* Presseisen (1985) identifies a hierarchy of five categories of basic thinking processes by drawing on the works of Bloom and Guilford. The first is *qualifications: finding unique characteristics* (units of basic identity; definitions, facts; problem/task recognition). The second is *classification: determining common qualities* (similarities and differences; grouping and sorting, comparisons; either/or distinctions). The third includes *relationships: detecting regular operations* (parts and wholes, patterns; analysis and synthesis; sequences and order; logical deductions). The fourth is *transformations: relating known to unknown characteristics, creating meanings* (analogies; metaphors; logical induction). The fifth includes *causation: establishing cause and effect, assessment* (predictions; inferences; judgments; evaluations).

Although most suggestions of "basic processes" are hierarchical, other people have listed them without sequencing them according to taxonomic criteria such as tasks moving from simple to complex operations, from more observable and concrete to abstract and covert dimensions, and from known to unknown materials (Burns and Brooks, 1970; Costa, 1985). As it may have been noted at this juncture, there is a proliferation of

taxonomies and lists of these "basic or essential skills of thinking." This proliferation has to some extent led to a measure of conceptual confusion in the field.

Complex Thinking Processes

The so-called complex processes or macro-processes are also an old theme. Boraas (1922), for example, did not only attempt to define thinking, but also identified several of these micro-processes and suggested how to foster them. Boraas suggested, among other things, the development of "individual judgment" (decision making), "imaginative thinking" (creative thinking), "problem-solving" and "critical thinking." Boraas also suggested the development of "cooperative thinking." C. E. Skinner (1945) suggested the fostering of "creative thinking and imagination," "problem-solving," "Critical thinking" and "reflective thinking." The term *reflective thinking* was probably first used by Dewey (1910; 1933) in his methods book for elementary teachers, How We Think.

Presseisen (1985) suggests that the complex processes are based on the basic processes but use these basic processes for a particular purpose. She identifies six complex processes, the first four of which had been suggested by Cohen (1971): problem-solving, decision-making, critical thinking, creative thinking, metacognition, and epistemic cognition. Pauker (1987) suggests a framework of complex processes which includes metacognition, problem-solving, decision-making, critical thinking and creativity.

Beyer (1988) also distinguishes "micro-thinking skills" (recall; translation; interpretation; extrapolation; application; analysis (compare, contrast, classify, seriate, etc.); synthesis; and evaluation) from complex ones. Under the latter category he includes *cognitive* and *metacognitive* components. The cognitive component includes *strategies* and *skills*. He identifies thinking strategies as including problem-solving, decision-making, and conceptualizing. Beyer regards *critical thinking* as a thinking *skill*, not a *strategy* as others would have it (Costa, 1985), and excludes creative thinking as a central component of his model of thinking. However he includes *certain kinds of knowledge* (which seem to relate to epistemic cognition identified by Presseisen) and *dispositions*. Thus, a complication which Beyer introduces is the distinction between "strategies" and "skills."

One more conceptual framework of intellectual processes which is suggested by Hyde and Bizar (1989) is quite unique from the ones cited above. This "model of teaching for thinking" (p. 16) involves six aspects: *schema* (schemata for plural), *focus, pattern, extension, projection, and metacognition*. Problem-solving and decision-making are included under extension, creative thinking under projection, and reflection under metacognition which they define as "Thinking about one's own thinking, using executive/control processes." This framework sees metacognition as constituted of Bruner's (1956) "cognitive strategies" which are currently called "executive/control processes" (Gagne, 1985, p. 195).

The literature indicates that there are as many suggestions of the so-called basic and complex processes and related models as there are researchers; the list keeps on growing. What is done at this juncture is to make a brief discussion of the macro-processes that seem to be emphasized. A discussion of each macro-process is intended to highlight a number of issues and concerns in the literature of thinking movement and inquiry-oriented teaching and learning. Hopefully the discussion will provide insights into the understanding of the nature of the problem of identifying the elements of an inquiring mind. These macro-elements include: *problem-solving, critical thinking, creative thinking, decision-making, metacognition, and epistemic cognition*. Although *reflection* is another such element, it is discussed after these processes which form a core of cognitive literature. A discussion of

cognitive developmental tradition and comparison of cognitive and behavioral approaches is made before looking at reflective thinking.

Problem-Solving

Figure 1 indicates that there are many different descriptions or models of problem-solving. These are just a few among the lot existing in educational literature. Although all educational thinkers and educators see problem-solving as an essential element of an inquiring mind they differ in how they perceive and use it. Some see it as a distinct process independent of other complex processes. Some equate it with "scientific method," which is in turn equated with "discovery," "inquiry process" and even "reflective thinking" and "critical thinking." Some educators who view problem-solving and other complex processes as the "scientific method" seem to base their thinking on Dewey's (1910; 1933) ideas on this method (Welton and Mallan, 1992; Tanner, 1988; Fair and Kachaturoff, 1988). Indeed, as it can be seen from Figure 1, almost all of the schemes of problem-solving draw on, modify or extend Dewey's stages of reflective thinking.

Some writers view problem-solving as underlying other complex processes (Beyer, 1988), while others see it as overlapping with other processes. For example, Dacey (1989) and Guilford (1986) use the notion of "creative problem-solving" to show the relationship between it and creativity. Eulie (1988) even claims that "the highest form of thinking is problem solving, for it requires the use of every level of critical thinking" (p. 264). Other people have tried to understand the nature of problem-solving by unpacking the concept of "problem" (Weizenbaum, 1981; Schrag, 1988; Hyde and Bizar, 1989; Henderson, 1992). We will return to this issue in the next chapter.

Meanwhile we may consider Dewey's (1916, pp. 170-192) suggestion that students should engage in solving problems which they are motivated to tackle. It must be a genuine problem - the pupil's own problem. Neither a simulated problem nor a practice problem intended to help pupils perform well on reasoning items on tests would qualify for, as Dewey says, "they are his *only* as a pupil, not as a human being" (p. 183). This fundamental part of Dewey's philosophy is ignored in cognitive thinking skills movement as it is in behaviorism. Problem-solving is essentially seen by advocates of the movement as a structured and disciplined process of solving well-structured, non-problematic, ready-made problems whose answers are known in advance by the problem designer. This observation does not only apply to "problem solving" but also to all other processes, be they basic or complex, in which "solving" a problem is involved.

Figure 1: Some Problem-Solving Processes

I.

1. Recognizing a problem: Suggestions.
2. Analyzing the problem: Intellectualization.
3. Suggesting of possible solution: Hypothesizing.
4. Testing of consequences: Reasoning.
5. Making judgment of the selected solution: Testing the hypothesis. by action. [Application].

- Dewey, J., 1933.

II.

1. Defining the problem [Goal].
2. Developing a tentative answer: Hypothesizing.
3. Testing the hypothesis.
4. Developing a conclusion.
5. Applying the conclusion.

- Beyer, B. K., 1971.

III.

1. Defining a difficulty/problem.
2. Assembling facts about the difficulty and determining additional information.
3. Inferring or suggesting alternative solutions.
4. Testing these solutions for appropriateness.
5. Potentially reducing to simpler levels of explanation and eliminating discrepancies.
6. Providing solution checks for generalizable value.

- Cohen, J., 1971.

IV.

1. Recognizing a problem.
2. Representing the problem.
3. Devising/Choosing solution plan.
4. Executing the plan.
5. Evaluating the solution.

- Beyer, B. K., 1988.

V.

1. Specifying the problem.
2. Analyzing the problem.
3. Formulating possible solution paths.
4. Evaluating possible solution paths.
5. Choosing a solution.

- McWhorter, K. T., 1988.

VI.

1. Recognizing a problem.
2. Enumerating the possibilities.
3. Reasoning.
4. Revising.
5. Evaluating..

- Baron, J., 1981.

VII.

1. Clarifying the problem.
2. Choosing a solution.
3. Carrying out a solution.
4. Checking the results.

- Derry, S. J. and Hawkes, L., 1985. In:S. J. Derry and D. A. Murphy, 1986.

VIII.

1. Identifying a problem.
2. Stating the research objective.
3. Collecting data.
4. Interpreting the data.
5. Making conclusions.

- Borich, G. D., 1988.

IX.

1. Deciding on a goal.
2. Making a plan to reach a goal.
3. Trying the plan.
4. Asking, Did the plan work?
5. Asking, Did I follow the plan?
6. Asking, What was wrong with the plan?

- Belmont, J. M., Butterfield, E. C. and Ferretti, R. P., 1982.

X.

1. Identifying the problem.
2. Defining the problem.
3. Exploring alternative approaches.
4. Acting on a plan/strategies.
5. Looking back and evaluating the effects of your activities.

- Bransford, J. D., and Stein , B. S., 1984.

Critical Thinking

Of all the kinds of thinking processes or skills discussed in educational literature, none has achieved greater attention from the educational community in recent years than *critical thinking* (Ennis, 1962, 1985, 1986; McPeck, 1981; Paul, 1983, 1985; Beyer, 1985, 1987, 1988, 1991; Sternberg, 1985; Klenz, 1987). Literature on critical thinking is so diverse and so confusing that Beyer (1988, p. 60) finds that it is one of the most *abused* terms in the thinking skills vocabulary. Beyer (1985) reviews definitions of critical thinking and finds that it is used as an umbrella for just about every thinking skill or process that can be taught, both basic and complex.

Defining critical thinking as virtually all forms of thinking is one of the most serious problems that have caused much confusion in the literature on thinking. For instance,

Figure 2: Some Critical Thinking Processes

I

1. Identifying central issues.
2. Recognizing underlying assumptions.
3. Evaluating evidence or authority by:
   a. Recognizing underlying assumptions.
   b. Recognizing bias and emotional factors in a presentation.
   c. Distinguishing between verifiable and unverifiable data.
   d. Distinguishing between relevant and non-relevant.
   e. Distinguishing between essential and incidental.
   f. Recognizing the adequacy of data.
   g. Determining whether facts support a generalization.
   h. Checking consistency.
4. Drawing warranted conclusions.

- Dressel, P. and Mayhew, L.B., 1954.

II

Determining if:

1. A statement follows from the premises.
2. Something is an assumption.
3. An observation statement is reliable.
4. An alleged authority is reliable.
5. A simple generalization is warranted.
6. A hypothesis is warranted.
7. A theory is warranted.
8. An argument depends on an equivocation.
9. A statement is overly vague or specific.
10. A reason is relevant.

- Ennis, R.H., 1966/1982.

III

Using basic thinking processes to:

1. Analyze arguments and generate insight into particular meanings and interpretations.
2. Develop cohesive, logical reasoning patterns and understand assumptions and biases underlying particular positions.
3. Attain a credible, concise and convincing style of presentation.

- Cohen, J., 1971.

IV

1. Distinguishing between statements of fact and statements of opinion.
2. Discriminating between statements of fact and statement of motive.
3. Determining the difficulty of proof.
4. Recognizing biased statements.
5. Drawing inferences.
6. Evaluating sources of information.

- Morse, H.T. and McCune, G.H., revised by Brown, L.E. and Cook, E., 1971.

V

1. Separating statements of fact from statements of value.
2. Distinguishing hypothesis from evidence.
3. Recognizing stated and unstated assumptions.
4. Recognizing logical inconsistency in an argument.
5. Distinguishing hypotheses from warranted conclusions.
6. Recognizing irrelevancy.
7. Recognizing logical fallacies.
8. Recognizing bias or frame of reference.
9. Recognizing organizing techniques or principles.
10. Recognizing persuading techniques.

- Fair, J., 1977

VI

1. Finding information.
2. Detecting bias (especially in terms of unreliability and overgeneralizing).
3. Evaluating a line of reasoning.
4. Weighing evidence.
5. Finding unstated assumptions.
6. Identifying ambiguous statements.
7. Identifying equivocal statements.

- Hudgins, B., 1977.

VII

1. Distinguishing between facts and opinions.
2. Evaluating differing viewpoints.
3. Evaluating generalizations.
4. Testing hypotheses.
5. Evaluating adequacy of data and evidence.
6. Recognizing persuasive language.
7. Identifying biased and slanted writing.
8. Evaluating arguments.

- McWhorter, K.T., 1988.

VIII

1. Distinguishing between verifiable facts and value claims.
2. Distinguishing relevant from irrelevant information, claims or reasons.
3. Determining the factual accuracy of a statement.
4. Determining the credibility of a source.
5. Identifying ambiguous claims or arguments.
6. Identifying unstated assumptions.
7. Detecting bias.
8. Identifying logical fallacies.
9. Recognizing logical inconsistencies in a line of reasoning.
10. Determining the strength of an argument or claim.

- Beyer, B.K., 1988.

critical thinking has been equated with Bloom's taxonomy of educational objectives (Sanders, 1966); "inquiry" (Ponder and Davis Jr. 1982); "logical reasoning" typical of traditional philosophy courses in which logic is viewed as the evaluation or assessment of arguments (Black, 1953; Werkmeister, 1957; Ennis, 1962); "decision-making" (Fraenkel, 1973/1980); and with "problem-solving" (Beyer, 1985, p. 271). The confusion is so great that Beyer (1988 p. 60) proposes to replace the term "critical thinking" with "evaluative thinking" because it is about evaluating or judging of statements and materials. This kind of thinking can be noticed from some of the models of critical thinking included in Figure 2.

Beyer (1988) goes on to claim that critical thinking "is essentially what Dewey described as" active, *persistent and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends*" (p. 61). This statement by Dewey (1933) has been used to define "reflective action" as against "routine action" (Zeichner, 1981-1982, p. 5; 1982, p. 104). This observation raises the question whether or not critical thinking also relates to reflective thinking. A possible overlap between them may probably be suggested by the use of the not uncommon term "critical reflection." Others believe that critical thinking is also interrelated with creative thinking (Klenz, 1987; Scriven, 1976; Beyer, 1988; Perkins, 1984).

Beyer (1988) believes that critical thinking is not a "thinking strategy" but a "thinking skill" because "it does not consist of a sequence of operations and subordinate procedures through which one proceeds in generally sequential fashion. Instead, critical thinking is a collection of specific operations that may be used singly or in any combination or in any order" (p. 61). He claims that his critical thinking operations "are listed not as a taxonomy but rather are arranged from the simple to the more complex" (p. 61). But most educational taxonomies use this principle of moving from simple to complex learnings, objectives and the like. Sternberg (1985) who has formulated a taxonomy of critical thinking processes would not agree with Beyer.

To add more complications Beyer (1988) further claims that problem-solving, decision-making and conceptualization (strategies) are more complex and more significant than critical thinking (skill). However, Paul, Binker and Martin (1989, p. 56) who have compiled a "Strategy List" of "35 dimensions of critical thought" would disagree with Beyer on not calling critical thinking as strategy. These educators view critical thinking as consisting of strategies contrary to Beyer's claim. The conceptual confusion is thus partly caused by a multiplicity of labels used to identify various thinking processes: skills, processes, operations, strategies, intellectual functions and the like.

Teaching of traditional logic to promote critical thinking has been challenged by several educators. Dashwood-Jones (1976) defines *argument* as "the process of drawing someone's attention to a series of intellectual positions such that each position becomes a reason for accepting what is to follow" (p. 3). Paul (1985), however, argues that argument in the real world is seldom a series of intellectual positions. It is more likely to be a mixture of facts, beliefs, values and biases with both rational and irrational aspects adopted by people with all degrees of reflective skepticism ranging from open-mindedness to total blindness to the basis or motives for their holding to a certain position. Further, arguments in the real world most often involve a mixture of knowledge from several subject areas. The unraveling of such arguments involves more than pure logic. Consequently, critical reasoning is not restricted to the assessment of arguments or of methods and strategies reconstructed as propositions.

Schrag (1988) argues that "logic does supply standards by which to judge the cogency of arguments, but it does not provide one with rules for thinking, for there are no such rules. ... positing the existence of such rules leads to an infinite regress, for rules

would be needed for applying the rules" (p. 19). Schrag finds that exercises in logic, like exercises in any other subject, require an understanding of the terminology and concepts of that subject and they require thinking which is never the mechanical application of rules, not even rules of logic. Alder (1987) writes:

> Many years ago, I taught courses in logic, using texts that stated the laws of thought, the rules to be followed in making inferences and judging them, and in avoiding fallacies. I discovered that students able to get high marks in a logic course were not, as a result, able to think critically or to read and discuss thoughtfully the difficult books assigned in seminars I conducted. Logic is no longer required in most colleges, for this very reason. The programs in critical thinking now being advocated from coast to coast are minuscule and oversimplified versions of the much more rigorous course in logic that I taught in college. And they will be just as inefficient. ... Nor will they train teachers to think critically.

Paul (1985) distinguishes between conception of critical thinking as a product of mastering a discrete set of skills and one of critical thinking as *emancipatory reason*. Klenz (1987) proposes that while Paul describes emancipatory reason as a "set of integrated macro-logic skills ultimately intrinsic to the character of the person" (p. 152), it might be better described as the integration of skills, abilities, values and attitudes. If critical thinking is viewed as emancipatory reason, it should include such values as truth, fairness, justice, empathy, autonomy, rationality and self-criticism. Further, emancipatory critical thought is based upon the belief that holding such values implicates one to act upon them.

Several dispositions or attitudes and values necessary for such critical thinking have been identified on the assumption that a person may know the processes of critical thinking and methods of doing it, but fail to do so due to a lack of "desire" or "will" (Klenz, 1987, p. 6). Such dispositions include intellectual curiosity, objectivity, open-mindedness, intellectual honesty, being systematic, persistence, and respect for other viewpoints (Klenz, 1987, pp. 25-26). Fraser and West (1961, p. 222) identify the following dispositions: an alertness to the need to evaluate information, assertions, and sources; a willingness to test opinions; and a desire to consider all viewpoints. Sears and Parsons (1991) suggest that critical thinking requires an attitude that knowledge is not fixed but always subject to reexamination and change; an attitude that there is no question which cannot, or should not, be asked; an awareness of, and an empathy for, alternative world views; and a tolerance for ambiguity. These educators suggest that critical thinking is indeed an adopted lifestyle. Paul (1985) calls such attitudes "passions." He includes among them: a passion for clarity, accuracy, and fair-mindedness; a fervor for getting to the bottom of things; a compelling drive to seek out evidence; an intense aversion to contradiction, sloppy thinking, inconsistent application of standards; a devotion to truth as against self-interest; a willingness to question what is passionately believed and socially sanctioned; and a willingness to conquer the fear of abandoning a long and deeply held belief.

Klenz (1987) suggest that critical thinking as a critical emancipatory, dialectical reasoning includes the following thought processes: interpreting, clarifying, analyzing, synthesizing, evaluating, question-raising, information-seeking, reflecting on one's own thinking, assuming and raising and pursuing further questions. Klenz believes that if the ultimate aim of a focus on critical thinking is the development of reflective, autonomous and democratic individual, education must include opportunities for growth in dialectical reason. The essence of dialectical thinking is to find in each case what are the oppositions, conflicts, contrasts, contradictions, the otherness, estrangement, alienation that are possible

in the content, and to find the notion that unite them by incorporating and using rather than destroying their tension.

Creative Thinking

Although creative thinking is not as frequently written about by educators as critical thinking and problem-solving, it is rather intricate to discuss, particularly in a short account such as this one. There are many definitions and theories of creativity (Davis, 1986; Dacey, 1989). Davis finds that in fact there are about as many definitions and theories of creativity as there are people who have set their ideas on paper.

Figure 3: Some Creative Thinking Processes

I

1. Preparation
2. Incubation.
3. Illumination.
4. Verification.
   - Walls, G., 1926.

II

1. A difficulty is felt.
2. The problem is clarified and defined.
3. A search for clues is made.
4. Various suggestions appear and are tried out.
5. A suggested solution is accepted.
6. A solution is tested
   - Kingsley, H.L. and Garry, R., 1957.

III

1. Sensing a problem or gap in information.
2. Forming ideas or hypotheses.
3. Testing and modifying.
4. Communicating the results.
   - Torrance, E.P., 1977

IV

1. Problem finding.
2. Idea generation.
3. Planning.
   - Hayes, J.R., 1981.

V

1. Fact-finding.
2. Problem-finding.
3. Idea-finding.
4. Solution-finding.
5. Acceptance-finding.
   - Osborn, A. F,. 1963.

VI

1. Cognition.
2. Memory.
3. Convergent thinking.
4. Divergent thinking.
5. Evaluation.
   - Guilford, J.P., 1986.

Definitions of creativity are usually classified according to whether they focus on the *person*, the *process*, or the *product* (Davis, 1986). The focus in this section is on the cognitive processes, but let us look at the other two definitions very briefly. There are many theories on the nature of a creative person. Dacey (1989), for example, in discussing theories about the formation of creative personality traits, relates the theme to psychoanalytic theories advanced by Sigmund Freud, Ernst Kris, Carl Jung, Otto Rank, Alfred Adler, and Emmanuel Hammer; and humanistic theories proposed by Abraham Maslow (known for his opposition to psychoanalytic point of view), Carl Rogers and Erich Fromm.

Studies have focused on personality and biographical traits of creative people. It has been found that, for example, creative people tend to be self-confident; independent; risk-taking; high in energy; adventurous; thorough; curious; playful and childlike; idealistic and reflective; attracted to the complex, asymmetrical and mysterious; and have wide interests, artistic and aesthetic interests; and need for privacy. Another list says that a creative person likes to work by himself or herself; is a "What if" person; constructs, builds and rebuilds; is irritated by the routine and obvious; is persistent and unwilling to give up; and does not mind the consequences of trying something new and appearing different. Some creative

abilities include fluency; flexibility; originality; elaboration; sensitivity to problems; problem defining; visualization; imagination; regression; metaphorical thinking; analysis; synthesis; evaluation; transformation; extending boundaries, intuition; predicting outcomes; resisting premature closure; concentration; and logical thinking. Other traits include indifference to conventions, stubbornness, resistance to domination, uncooperativeness, cynicism, and being temperamental, demanding, too emotional, and absentminded (Davis, 1986, Chap. 3; Dacey, 1989, Chap. 3).

Definitions that focus on the creative product tend to emphasize *originality*, a word sometimes used interchangeably with creativity; and *practicality*, or *value* or social worth of the product.

Dacey (1989) analyzes *creative mental processes* according to three categories of theories: those in the associationist position, such as those proposed by Francis Galton, William James, Graham Wallas and S. A. Mednick; those in the Gestalt position, for instance, those proposed by Max Wertheimer, Wolfgang Kohler, and Howard Gruber; and those in the cognitive approach, which is the focus of this discussion.

Beyer (1988) gives the impression that there are no "skills" specifically labeled as creative thinking. However, as Figure 3 indicates, several stepwise "creative thinking processes" have been identified just as in the case of problem-solving and critical thinking. Scriven (1976), Beyer, (1988), Klenz (1987) and Schrag (1988) find that creative thinking is interrelated with critical thinking and problem-solving, hence the notion of "creative problem-solving." Consequently, Scriven believes, creativity is not just a matter of being different from other people, it is a matter of having a different idea that works well or better than previous ideas. Some writers, however, portray creativity as a distinct, unique ability which other people possess and others do not; this is the picture given by most studies which define creativity in terms of characteristics of a creative person.

Beyer (1988) suggests that the term creative thinking also deserves to be replaced by one less tinged with unfortunate connotations, and suggests the term "generative thinking." Over the years, creative thinking has come to be tied essentially to the theater and fine arts and to literary enterprise, in spite of the fact that creative thinking - the invention of new patterns, relationships, combinations or products - occurs in all subject areas and human phenomena.

While one may agree with Beyer (1988) that creative and critical thinking are not the same thing, though interrelated, the way he distinguishes between the two seems rather confusing. He states that "whereas creative thinking is divergent, critical thinking is convergent; whereas creative thinking seeks to generate something new, critical thinking seeks to assess worth or validity in something that exists; whereas creative thinking is carried on often by violating accepted principles, critical thinking is carried on by applying accepted principles" (p. 64). Earlier discussion on critical thinking shows clearly that to believe that it merely applies accepted principles is highly questionable and indeed unacceptable. Guilford's theory of the "structure of intelligence" includes five "operations" and two of them are convergent thinking and divergent thinking; he also includes evaluation. These three processes are central to Guilford's model of creative problem-solving (Guilford, 1986 pp. 93-98; Dacey, 1989 pp. 100-121). Thus, to claim that critical thinking is only convergent while creative thinking is only divergent is indeed very misleading. Each of these macro-processes must involve both convergent and divergent thinking to varying degrees. Another process which Beyer (1988) and Scriven (1976) believe distinguishes creative thinking from other forms of thinking is synthesis. Again, to believe that synthesis is exclusively creative process is equally misleading. All macro-processes do involve synthesis to some degree.

Several writers believe that creative thinking, like critical thinking, is distinguished by a number of dispositions (McCormack, 1984; Perkins, 1984; 1985; Dacey, 1989; Davis, 1986; Beyer; 1988, Klenz, 1987). Perkins (1984) notes that creative thinking is largely a state of mind. It seems to be primarily guided by a desire to seek the original. It values mobility, it revels in exploration, it feeds on flexibility, and it honors diversity. Perkins also finds that creative thinking attends to purpose as much as or more than to results, works at the edge of one's competence, and is driven by intrinsic motivation to be original.

Decision-Making

Decision-making has been defined as the process of making *reasoned choices* from among alternatives, choices that are consistent with the decision maker's values (Cassidy and Kurfman, 1977, p. 1; McWhorter, 1988, pp. 122-123). To emphasize the "reasoned," McWhorter identifies three types of decisions: *routine decision* and *impulsive (emotional) decision*, both of which involve little or no thought, and *reasoned decision* based on evidence. Figure 4 indicates that almost all the models cited use the words "alternative" or "option" and "choice" or "choose," and some schemes also use the word "value." In other words, most models seem to fit the above definition of decision-making. However, as in the case of other macro-processes, Figure 4 also reveals differences in how different people conceptualize decision-making.

While Beyer (1988) calls decision-making a thinking strategy, others call it a skill or a process consisting of a set of stages (Kurfman, 1977; Costa, 1985). Some psychologists and educators see a very close relationship between decision-making and problem-solving. McWhorter (1988), for example, states that decision-making has much in common with problem-solving. "In problem solving you identify and evaluate solution paths; in decision making you make a similar discovery and evaluation of alternatives. The crux of decision making, then, is the careful identification and evaluation of alternatives"(p. 123). Indeed, Wales and Nardi (1984) combine problem-solving and decision-making into one extended process and treat all problems as essentially situations requiring *decisions about problem solutions*. A comparison of Figure 1 and Figure 4 reveals that as with other complex processes, a *problem* (or goal/purpose of inquiry) underlies all models of decision-making process. Again, the interrelationship between problem-solving and decision-making attests further to the inherent and complex interconnections between all kinds of processes, both basic and complex, and dispositions.

Although Figure 4 suggests that "values" are involved in the process of decision-making, it has not been the practice of psychologists and educators to identify attitudes and values of decision-making as has been the case with other processes. Literature dwelling on this theme seems to be uncommon in educational discourse. This notwithstanding, it would be naive to assume that dispositions are not involved in the process of decision-making.

Figure 4: Some Decision-Making Processes

I

1. Isolating values involved.
2. Judging and selecting between the values
3. Discovering fact with regard to the situation.
4. Estimating consequences of various alternatives in the light of values set up.
5. Weighting relative strengths of satisfactions, dissatisfactions, comforts, measures, annoyances.

- Patrick, C., 1955.

II

1. Using basic thinking processes to choose a best response among several options.
2. Comparing advantages and disadvantages of alternative approaches.
3. Determining what additional information is required.
4. Judging the most effective response and being able to justify it.

- Cohen, J., 1971

III

1. Choosing from a number of acceptable alternatives when there is generally no accepted best or correct alternative.
2. Making simultaneous evaluation of alternatives rather than serial testing.
3. Using non-experimental, qualitative, and quantitative criteria in analyzing various alternatives.
4. Making repeated reference to values in applying these criteria.

- Kepner, C.H. and Trego, B.B., 1984.

IV

1. Stating the goal: identifying the problem; prioritizing it; selecting the correct approach to solve the problem; gathering the information to define the situation that exists.
2. Considering possible options and constraints and assumptions. Finding the causes.
3. Preparing a plan: analyzing the questions that are asked; synthesizing answers; preparing detailed plan; evaluating the plan. Solving the problem.
4. Taking action: implementing the plan; checking the results; making recommendation; reporting. Anticipating potential problems.

- Nardin, A.H. and Wales, C.E., in Costa, A.,1985, pp. 220-223.

V

1. Defining and clarifying a problem
2. Examining options
3. Anticipating consequences
4. Selecting a solution

- Eulie, J., 1988

VI

1. Defining the goal
2. Identifying alternatives.
3. Analyzing alternatives.
4. Ranking alternatives.
5. Judging highest ranked alternatives
6. Choosing "best alternative"

- Beyer, B.K., 1988.

VII

1. Identifying and analyzing decision alternatives.
2. Considering the outcome each alternative is likely to produce in both the short term and the long term.
3. Comparing alternatives based on how easily you can accomplish each.
4. Evaluating possible negative effects each may produce.
5. Considering the risks involved in each alternative.
6. Making the most appropriate choice(s)

- McWhorter, K.T., 1988.

VIII

1. Recognizing the occasion for decision. Ask: What should be done?
2. Analyzing the problem, marshaling the facts of the case, recognizing the issues, relating them to what is known.
3. Identifying two or more possible courses of action, when often only one is apparent or preferred.
4. Projecting short-term and long-term consequences of each of these courses of action, applying principles of knowledge.
5. Identifying related values and goals.
6. Judging the consequences in the light of these values.
7. Making a choice of one course of action or even some newly recognized, trade-off position among them.
8. Making the decision, the chosen course of action, and the reasons for supporting it explicit to oneself and others.

- Fair, J., and Kachaturoff, G., 1988

Metacognition

Pauker (1987, p. 36) believes that metacognition is neither a thinking process nor a thinking skill. It is an attitude, a point of view, a way of being aware that a person is thinking. The fact that the Greek word "meta" may mean "after," "along with," "beyond," "among," and "behind," suggests that defining metacognition is not simple. Pauker finds that metacognition refers to individual's awareness of their own cognitive performance and the use of that awareness in altering their thinking behavior. John Flavell who is often credited with the popularization and development of this macro-process states:

> Metacognition refers to one's knowledge concerning one's own cognitive processes and products or anything related to them, e.g. the learning-relevant properties of information or data. For example, I am engaged in metacognition (metamemory, metalearning, metaattention, metalanguage, or whatever) if I notice that I am having more trouble learning A than B: if it strikes me that I should double-check (before accepting it as a fact); if it occurs to me that I had better scrutinize each and every alternative in any multiple-choice type task situation before deciding which is the best one; if I become aware that I am not sure what the experimenter really wants me to do; if I sense that I had better make a note of D because I may forget it; if I think to ask someone about E to see if I have it right (Flavell, 1976, p. 232).

While Pauker (1987) sees metacognition as neither a thinking process nor a skill, Preseissen (1985) defines metacognition as the skills associated with the learner's awareness of his or her own thinking. Hyde and Bizar (1989) believe that "metacognition (literally, *over* or *overseeing* cognition) refers to our own ability to understand and manipulate our own cognitive processes. It involves thinking about our own thinking and purposely making changes in how we think" (p. 51). These educators see metacognition as consisting of "metacognitive processes." Beyer (1988) who also describes metacognition "as thinking about thinking" (p 47), sees it as consisting "of those operations involved in directing one's efforts to find or make meaning. .... Any act of thinking involves a combination of operations designed to produce meaning (cognitive operations) and to direct how that meaning is produced (metacognitive operations)" (p. 47).

It can at this point be recalled that the notion of metacognition is related to what Bruner, Goodnow and Austin (1956) called "cognitive strategies" also known as "executive/control processes" (Gagne, 1985; Hyde and Bizar, 1989). Beyer (1988) considers "metacognition as the highest, most sophisticated form of thinking. Many, in fact, conceive of it as the executive function of the mind; that operation by which individuals manage and direct how they go about using their minds" (p. 68).

Figure 5: Some Processes of Metacognition.

I

1. Monitoring Task Performance (Task Oriented Dimension):
   a. Keeping place, sequence.
   b. Detecting and correcting errors.
   c. Pacing of work.
2. Selecting and Understanding Appropriate Strategy (Strategic Dimension):
   a. Focusing attention on what is needed.
   b. Relating what is known to material to be learned.
   c. Testing the correctness of a strategy.

- Presseissen, B.Z.; in Costa, 1985, pp. 46-47.

II

1. Identifying the goal.
2. Making an action.
3. Undergoing metacognitive experience.
4. Arriving at metacognitive knowledge.

- Flavell, H.J., 1979; 1981.

IV

1. Self-planning-or-strategizing.
2. Self-monitoring-or-checking.
3. Self-regulating.
4. Self-questioning.
5. Self-reflecting.
6. Self-reviewing.

- Hyde, A.A. and Bizar, M., 1989.

III

1. Planning:
   a. Stating a goal.
   b. Selecting operations to perform.
   c. Sequencing operations.
   d. Identifying potential obstacles/errors.
   e. Predicting results desired and/or anticipated.
2. Monitoring:
   a. Keeping the goal in mind.
   b. Keeping one's place in a sequence.
   c. Knowing when a subgoal has been achieved.
   d. Deciding when to go on to the next operation.
   e. Selecting next appropriate operation.
   f. Spotting errors or obstacles.
   g. Knowing how to recover from errors, overcome obstacles.
3. Assessing:
   a. Assessing goal achievement.
   b. Judging accuracy and adequacy of the results.
   c. Evaluating appropriateness of procedures used.
   d. Assessing handling of obstacles/errors.
   e. Judging efficiency of the plan and its execution;

- Beyer, B.K., 1988.

Figure 5 shows some models of the "processes" of metacognition. It seems that this macro-process has been related more to problem-solving than to other complex processes. In fact Bruner's concern was "problem solving" in mathematics and physical sciences. Even Flavell (1976) views it in terms of "metacognitive aspects of problem solving."

Figure 5 also shows that metacognition is related to *reflection*. Indeed, Hyde and Bizar (1989) state that "metacognition is helping students *reflect* on their own thinking" (p. 51). In their model they include "self-reflection" as one of the metacognitive processes. Costa (1985), too, notes that monitoring thinking involves both looking backward to the plan and looking ahead to anticipate appropriate future moves. It also involves attending very carefully to what is going on at the moment. In short, Figure 5 reveals that metacognition, like other processes, is related to various types of both "basic" and "complex" processes.

Beyer (1988) finds that metacognition is also linked closely to the dispositions that constitute thinking. He cites dispositions such as the willingness to engage in thinking and to stay at it until the goal has been achieved, and an insistence on evidence and reasoning to justify conclusions and assertions. Like other processes, metacognition involves a number of dispositions.

Epistemic Cognition

Several people believe that another complex process of thinking is "epistemic cognition." Although this process is discussed here under cognitive psychology, it is also a philosophical issue. Presseisen (1985, p. 47) suggests that epistemic cognition includes the skills and knowledge associated with understanding the limits of knowledge, as in a particular subject matter, and the nature of problems that thinkers can address. Klenz (1987) notes that epistemological issues are part and parcel of critical and creative thinking, and states that epistemology has to do with the origins, nature, methods, and limits of knowledge - with how one can and could be certain of the truth of any claim. Thus, for Klenz epistemic cognition is related to critical and creative thinking.

Although Beyer (1971; 1988) does not use the term "epistemic cognition" or even "epistemology" believes that thinking includes a *knowledge* component - knowledge of general heuristics, of subject areas, and of the nature of knowledge itself. For instance, the nature of knowledge includes knowing that what we believe in as knowledge is constantly changing and therefore highly tentative, selective and fragmentary, and thus what passes as knowledge is actually nothing more than someone's *interpretation*. Therefore, what one individual or group believes or accepts as knowledge may not be accepted by another individual or group.

So far the discussion has explored some notions on the basic and complex cognitive processes. The section that follows focuses on some inquiry issues related to developmental psychology and how they are interrelated to cognitive psychology.

COGNITIVE DEVELOPMENTAL TRADITION

Cognitive psychologists have also been interested in how the cognitive capabilities of individuals develop over time. The cognitive approach to learning was pioneered by a Swiss psychologist Jean Piaget who was interested in children's cognitive development. Beginning in the 1920s, he observed and interviewed children, presenting them with intellectual tasks, and recorded their answers. He reported his findings in many volumes (Gagne and Berliner, 1984, pp. 130). His later work is closely aligned with that of his colleague, Barbel Inhelder (for example, Inhelder and Piaget, 1958; Inhelder and Piaget, 1964). Piaget's ideas were translated in English by Flavell (1963) and have been written about and used by numerous psychologists and educators. Cognitive development has also been studied and described by Bruner (1966).

Piaget saw cognitive development of children as consisting of four main stages: *sensorimotor* stage (which runs from birth to two years); *preoperational* stage (which is divided into two periods - the *egocentric*, through age four, and *intuitive*, five to seven years); *concrete operational* stage (seven to twelve years); and *formal operational* sage (thirteen years and after).

Piaget also identified cognitive developmental processes which children or learners experience as they go through these stages. In general, they engage in a process of seeking an *equilibrium* between what they presently perceive, know and understand, on the one hand, and what they see in any new phenomenon, experience, or problem. If their present condition can handle the new situation, their equilibrium is undisturbed. If it cannot, then some intellectual work is necessary to restore the equilibrium. That is, some *adaptation* by the learner to his or her environment must take place.

Adaptation takes two forms, which occur simultaneously. These forms are *assimilation* and *accommodation*. Assimilation is the process of changing what is perceived so that it fits present *cognitive structures*, while accommodation is the process of changing the cognitive structures so that they fit what is perceived. Assimilation is comparable to the acts of chewing and digesting in order to transform food into something the body can use. Assimilation transforms new ideas into something that fits into one's cognitive structure. Accommodation is comparable to the adjustments made by the body in eating and using food, such as opening the mouth, contracting the muscles of the throat, esophagus, and stomach, and secreting the digestive juices. In the same way, an existing cognitive structure must be modified, extended, or refined in coming to grips with a new or anomalous idea.

The term cognitive "schema" ("schemata" for plural), has been used (Rumelhart and Norman, 1978; Mandler, 1985) to describe this cognitive structure. Indeed, Rumelhart and Norman's three types of learning labeled "accretion, " "restructuring" and "tuning" bear a strong similarity to Piaget's assimilation and accommodation. Accretion involves adding new data to the existing data base of knowledge. When existing memory structures or *schemata* are not adequate to account for new knowledge, either old structures must be modified - tuning" - or new structures have to be generated - "restructuring." Mandler uses the term "schema" to evoke similarities with Piaget's usage. Recall that Hyde and Bizar (1989) view "schema" as one of the cognitive processes in their model, and they include "critical thinking" in this category.

Bruner (1966) also worked with children in a manner similar to Piaget's. From his observations Bruner believed that there were three stages of growth in the ways that children come to represent the world. The first is the *enactive* stage, in which motor action is the way the child understands the environment; it is supposed to be a nonthinking stage, and learning is through psychomotor knowledge alone. The next cognitive level is where information is carried by imagery; it is called *iconic* stage. The third is *symbolic* stage, where nonthinking behavior and perceptual understanding give way to symbolic systems. Language, logic, and mathematics come into play.

Piaget's developmental theory has been criticized by several people. For example, Brainard (1978a, 1978b) has attacked the stage theory by calling it non-explanatory, providing nothing more than mere description. He noted that multiplication ability always follows the development of the ability to add, but no one presumes that this sequence has any biological origins. The biological implications of Piaget's stage theory may, therefore, be superfluous.

Boden (1980) points out that Piaget often underestimated the complexity of children's cognitive achievements at a particular age. Dozens of studies show, for example, how neonates may be displaying more complex behavior than Piaget (or the rest of us)

believe possible. Piaget also made much out of a child's egocentric speech and perception. But many researchers have now demonstrated that children can be very *social* in speech at very young ages, and when given appropriate instructions, are able to make different perspectives in perception. These are characteristics that Piaget believed to come much later in development.

Another issue has to do with the definition of formal operations. Only a small percentage of the general population would appear to possess formal operational abilities, at least as Piaget defined them. The fault here seems to be in Piaget's adherence to abstract tasks in order to investigate formal operational thought. For example, in two tasks requiring exactly the same logical processes, one presented abstractly, and one presented with concrete referents, the percentage of people showing formal operational thought changed from 19 percent to 98 percent (Boden, 1980). This kind of study reveals the crucial role of *context* in people's thinking. Different tasks, instructions, social settings and so forth, influence greatly how we think.

Furthermore, we have disequilibrium occurring over the research studies, once thought to demonstrate that children could not really be taught certain kinds of things before they reached certain ages. This age requirement appears not to be true. It has been found out that concrete or formal operational thought can occur much earlier than Piaget might have considered possible (Case, 1978; Brainard, 1978b; Scandura and Scandura, 1980).

Gardner (1982, p. 5) argues that Piaget as well as other cognitive *structuralists* share a belief that the mind operates according to specifiable rules - that these can be uncovered through systematic examination of human language, action and problem-solving and that the options of human thought are preordained or limited in advance. This makes their work especially problematic for a study of mind where the major focus falls on innovation and creation, as in the fashioning of original works of arts. The limitation implicit in the standard structuralist stance can be circumscribed by a recognition of one special feature of human thought - its ability to create and sponsor commerce through the use of various kinds of symbol systems. These symbol systems - these codes of meaning - are the vehicles through which thought takes place: by their very nature they are creative, open-systems.

Adherents of the age condition in Piagetian developmental theory sequence instructional content in such a way that children have to "wait" to learn certain things until they reach a certain age. Klenz (1987, p. 64) argues that where creative thought is the issue, one conclusion that might be drawn from examining developmental theory in the light of research which contradicts some aspects of it would be to suggest that scope and sequence type of curriculum design which is focused by age theories of human thinking may not be that useful an approach. Curriculum design informed by knowledge of children's physical development and (culturally-shaped) social development together with a firm grasp of the field which is being translated into a school subject might be easier to justify.

COMPARING COGNITIVE AND BEHAVIORAL APPROACHES

Contemporary cognitive psychology takes the computer for its inspiration. Lachman, Lachman and Butterfield (1979), for example, write:

> Computers take symbolic input, record it, make decisions about the recorded *input*, make new expressions from it, store some or all of the

> input, and give back symbolic *output*. By analogy, that is most of what cognitive psychology is about. It is about how people *take in* information, how they recode and remember it, how they make decisions, how they transform their internal knowledge states, and how they translate these states into *behavioral outputs* (p. 99) (emphasis added).

This computer analogy sums up the basic theory in cognitive psychology: the *information processing theory* in which "cognitive psychologists 'discover' problem solving-like processes implicated in tasks which we would consider quite *un*problematic" (Schrag, 1988, p. 45). This analogy also reveals how cognitive psychology is still rooted in behaviorism. Skinner would claim that such a conception of a learning model is basically no different from his teaching machines and programmed learning.

Gage and Berliner (1984, pp. 299-330) explain and demonstrate how such a view of cognition, "an information-processing model of memory," is based on the S-R framework. The model shows *stimulus* and *response* as the starting and end points of a particular event, just as is the case with operant conditioning theory. Cognitive psychologists have largely embraced basic notions of behavioral psychology, including S-R theory and "observable behavior." Schrag (1988) finds that although behaviorism as a research paradigm appears to be moribund, the behaviorist emphasis on "clean" laboratory experimentation and stringent criteria in interpreting evidence has been internalized by all psychologists who aspire to wear the mantle of science. Oddly enough, this leaves the cognitive psychologists with some of the same problems as the behaviorists in accounting for complex thinking.

In terms of the nature of the questions investigated, for example, Schrag, who distinguishes between *well-structured* problems in which goals, constraints, and allowable "moves" are precisely specified, and *ill-structured* problems in which none of these may be, finds that most of the problems we confront in our ordinary or our professional lives are ill-structured problems. In such cases, *the definition of the problem is itself problematic*. This means that a good deal of time and energy must be devoted to discovering and formulating the nature of the problem. "Ill-structured problems, some of which are engaged in over months and even years, rarely find their way into the psychology laboratory for obvious reasons: "clean" experiments require responses from a number of subjects that can be readily observed, tallied, compared; treatment and control groups that differ by just one variable; a modest length of time to engage subjects" (Schrag, 1988, p. 54).

Schrag (1988) also notes that another difficulty which besets the experimental study of thinking may be called the problem of studying extraordinarily complex systems. Any experiment with human subjects involves individuals with varying life histories, motivations, moods, aptitudes, and so on. Cognitive psychologists, unless they are especially interested in the effects of one of these human characteristics on cognitive performance, will do all they can to minimize their impact. This reason is why many of the experiments designed to understand cognitive processes involve tasks which can be performed by any subject virtually instantaneously (Lachman, Lachman, and Butterfield, 1979 Chapters. 4-5).

The attempt to isolate and study the cognitive subsystem apart from contaminating influences indeed has its parallels in all laboratory sciences. But this very attempt places a limit on what kinds of thinking psychologists will study. Most of human inquiring is contaminated by our personalities, aptitudes, illogicalities, attitudes, beliefs, and so on. In wishing to eliminate all such influences, cognitive psychologists are led to eliminate the

conditions most of us think under "in the wild." The process of controlling contaminating influences is of course a reduction of human nature to the objective condition.

The ironic consequence is that the stance of cognitive psychologists with respect to the study of human thinking is not as different from behaviorists' as one might expect. As behaviorist psychologists eschew experiments on complex human reasoning in natural settings so do a majority of cognitive psychologists. This shortcoming is also observed by Flavell (1976) in a critique of cognitive research done by Resnick and Glaser who used problem situations which were not naturalistic or "ethnological-ecological."

Schrag (1988) notes that even when investigators study how authentic experts solve actual problems, those they choose to study are hardly representative of the range of problems humans encounter in their professional lives. He cites Greeno and Simon's study in which, of the over two hundred references, only about five deal with problems in which neither goals, nor procedures nor constraints are prescribed. There were no references to problem-solving in any of the fine arts or the humanities, to say nothing of the interpersonal domain.

Schrag (1988) also notes that just as behaviorism assumed that complex behavior is built up of elementary processes, the more fundamental "atoms" of "learning," which must be understood first before complex processes can be investigated, so does cognitive psychology. Only now the elements are given names like "stimulus encoding" and "node activation" rather than "extinction" or "reinforcement." Related to this assumption are notions of *hierarchies* or *taxonomies* of behaviors or processes and objectives, and *structure* of subject matter. Beliefs in hierarchical structures seem also to relate to *linearity* typical of programmed instruction and stepwise models of cognitive processes. Consequently, instructional programs based on such notions and beliefs become highly structured, rigorously logical and absolutely "driven" by unproblematic rules, principles and models. Flavell (1976), in fact, cautions against adherence to "models" rigidly:

> don't overestimate the correspondence between your information-processing type flow diagrams ... and cognitive reality ... models do have a way of taking on an air of reality through sheer use and familiarity. I suspect that a lot of human thought, even in problem-solving situations, may be erratic and inconsistent in direction, subject to multiply embedded interruptions and detours, and generally replete with vague, difficult-to-model ideas (p. 234).

These issues highlight some of the problems that face cognitive psychologists. Despite the current ascendancy of cognitive or information-processing approaches to the investigation of the human mind, and resultant models, procedures and numerous programs to foster thinking, many serious questions have been raised about the ultimate fruitfulness of this paradigm. Although some of their ideas are certainly useful and indeed not new in education, other ideas seem to be totally antithetical to the development of an inquiring mind. This is partly because the behaviorist hegemony is still "contaminating" cognitive psychology.

REFLECTION

Reflection, like the other processes discussed so far, is an elusive and slippery concept used in educational discourse; there is a good deal of contention at the moment as to precisely what it might mean (Smyth, 1989; Grimmett, 1988). The term has become an "educational slogan" prone to meaninglessness, lacking sufficient conceptual elaboration

and programmatic strength (Bullough, 1989; Liston and Zeichner, 1987, Gore, 1987). Indeed, like critical thinking, reflective thinking has been used by some educators as a basket of all thinking processes, skills and dispositions.

It seems that Dewey (1910, 1933) was the pioneering educational philosopher and educator to use the concept of reflection in relation to teaching and learning when he stated that "the better way of thinking ... is called *reflective thinking*: the kind of thinking that consists in turning a subject over in the mind and giving it serious and consecutive consideration" (Dewey, 1933, p. 3). Dewey's concept of reflective thinking was explained in a number of other of his works besides How We Think (Stewart, 1977). In fact some people believe that there is nothing in Dewey but some variation on "how we think" (Geiger, 1958, p. 85). Thus, the current emphasis on "reflection" in teaching and learning is not new, as "we have been down a very similar track before, most notably with the work of Dewey" (Smyth, 1989 p. 2). But it seems that the dominance of behaviorism

Figure 6: Some Processes of Reflection/Reflective Thinking.

I

1. Occurrence of something felt as a perplexity.
2. Observation designed to make clear precisely what the difficulty is.
3. Occurrence to mind of suggested solutions of the difficulty.
4. Reasoning out the consequences involved in the suggestions thus entertained, and evaluating the suggestions by their aid:
   a. deducing the consequences of suggestions.
   b. comparing them as thus expanded in the light of the controlling problem.
   c. selecting the most promising suggestion.
5. Observation of experiment to test by empirical fact the suggested solutions in the light of their implications.
6. In some cases of reflection there may follow what is temporarily a sixth step: surveying of the preceding thinking to uncover any inadequacies that might be corrected.

- Patrick, C., 1955.

II

1. Recognizing a dilemma.
2. Responding to a dilemma by recognizing both the similarities to other situations and the unique qualities of the particular situation.
3. Framing and reframing the dilemma.
4. Experimenting with the dilemma to discover the consequences and implications of various solutions.
5. Examining the intended and unintended consequences of an implemented solution and evaluating the solutions by determining whether the consequences are desirable or not.

- Ross, D.D., 1989.

III

1. Describing.
2. Informing.
3. Confronting.
4. Reconstructing.

- Smyth, J., 1989; 1992.

IV

1. Questioning what, why and how things are done.
2. Emphasizing inquiry as a tool of learning.
3. Suspending judgment, waiting for sufficient data, or self-validating.
4. Seeking alternatives.
5. Keeping an open mind.
6. Comparing and contrasting.
7. Seeking the framework, theoretical basis, underlying rationale (of behaviors, methods, techniques, programs).
8. Viewing from various perspectives.
9. Identifying and testing assumptions; seeking conflicting evidence.
10. Putting into different/varied contexts.
11. Asking "Why if...?"
12. Asking for others' ideas and viewpoints.
13. Adapting and adjusting to instability and change.
14. Functioning with uncertainty, complexity, and variety.
15. Hypothesizing.
16. Considering consequences.
17. Validating what is given or believed.
18. Synthesizing and testing.
19. Seeking, identifying, and resolving problems ("problem setting," "problem solving").
20. Initiating after thinking through (alternatives, consequences).
21. Analyzing - What makes it work; in what context would it not?
22. Evaluating - What worked, what didn't, and why?
23. Using prescriptive models (behavioral models, protocols) only when adapted to the situation.
24. Making decisions in practice of the profession (knowledge created in use).

- Roth, R. A., 1989.

in education between the 1920s and the 1960s and the cognitive psychology movement tended to obscure and sidetrack reflective thought which is now making an aggressive come-back.

Dewey (1933) suggested two basic "phases" of reflective thinking: "(1) a state of doubt, hesitation, perplexity, mental difficulty, in which thinking originates and (2) an act of searching, hunting, inquiring, to find material that will resolve the doubt, settle and dispose of the perplexity" (p. 12). It is the situation which "perplexes and challenges the mind so that it makes belief at all uncertain" (p. 13) and leads to investigating "a genuine problem" (p. 13) that is involved in "an act of research, or inquiry" (p. 13). Dewey perceived "mental operations to include the trivial and ordinary as well as the technical and

recondite," and "the result of the act is to bring facts before the mind that enables a person to reach a conclusion on the basis of evidence" (p. 13).

The two phases of reflective thinking are a summary of his stages of thinking (Figure 1) which constituted his notion of "scientific method." He saw scientific method as "experimental method" and states that "every complete act of reflective inquiry makes provision for experimentation - for testing suggested (hypothesized) and accepted principles by employing them for the active construction of new cases, in which new qualities emerge" (p.188). Dewey viewed scientific method - which has been given various labels including problem-solving, reflective thinking, inquiry method, the method of intelligence, critical thinking, exploration, and the like - as a means of human emancipation from the dictates of empirical and behavioral method.

Dewey was opposed to dualisms of all kinds: between mind and matter or body, science and morals, humankind and nature, thought and action, theory and practice. He regarded inquiry as a continuous process (Stewart, 1977 p. 16). His conception of thinking was far broader than the contemporary view of thinking advocated by behavioral and cognitive psychologists. Tanner (1988) finds that Dewey saw thinking as a human trait and activity (as contrasted with other animals) of human living in an uncertain world. For him thinking is a mental-moral/ethical-physical process, involving seeing a real or genuine problem through, from setting it up to testing plans of action to see which idea solves the problem to actual solution of the problem by the thinker himself or herself. Thus, Dewey viewed thinking as a form of action, both mental and physical, rather than a mere "act of mind" as Adler (1987) believes. This progressive view notwithstanding, Dewey's thinking could not disengage completely from the influence of associationism and empiricism which he indeed attacked (Dewey, 1933; Stewart, 1977; Zeichner, 1981-1982).

Figure 6 shows that there are several other suggestions of models of reflective process. The most interesting one is suggested by Roth (1989). This model seems to be a compendium of what has been cited in literature under almost all the elements of inquiry, including Dewey's ideas. Other educators (Ross, 1989; King (1977) and Kitchener (1977) have even suggested *developmental* models of reflection. According to Kitchener, for example, the reflective judgment of adults becomes increasingly complex over time by progressing through seven stages.

Reflection-on-action

Reflection has traditionally been conceived in the literal sense of its *Latin* origin in which it means "bending back" - that is, reflection as *retrospective* activity. It is according to this conception that Dewey (1975) states: "to reflect is to look back over what has been done to extract the next meanings which are the capital stock for intelligent dealing with further experience" (p. 87). Kemmis and McTaggart (1982) also find that reflection is retrospective - it calls action as it has been recorded in observation. It seeks to make sense of processes, problems, issues and constraints made manifest in strategic action. The concept of *reflection-on-action* is based on this kind of reflection done *after* the action.

Like other macro-processes discussed so far, reflection is also interrelated with different processes. For instance, Kemmis and McTaggart (1982) note that reflection has evaluative as well as descriptive aspects. It asks the practitioner to weigh the experience - to judge whether effects (and issues which arose) were desirable and suggest ways of proceeding. The descriptive aspect of reflection allows reconnaissance, building a more vivid picture of life and work in the situation, constraints on action and, more importantly, of what might now be possible.

Bullough and Ross find reflection linked to decision-making. Bullough (1989) believes that Dewey's definition of reflective thinking and the two broad phases constitute "reflective decision making" and that Dewey's notions are "a particular kind of decision making" (p. 18). Ross (1989) defines reflection "as a way of thinking about educational matters that involve the ability to make rational choices and to assume responsibility for those choices" (p. 22). Kitchner and King (1981) have developed seven stage model of the development of "reflective judgment."

Others find reflection interrelated with critical thinking, hence the most commonly used concept of "critical reflection" in educational literature (Elbaz, 1988; Klenz, 1987; Armaline and Hoover, (1989). Dewey (1933) uses the term "critical" in relation to reflective thinking when he states that there may be a state of perplexity and also previous experience out of which suggestions emerge, and yet thinking need not be reflective. "For the person may not be sufficiently critical about the ideas that occur to him" (p. 16). It seems Dewey assumed his conception of reflective thinking automatically included the notion of critical thinking. Using Dewey's (1933) definition of reflective thinking, Armaline and Hoover (1989) believe that critical reflection is not a point of view but rather a process of validating or invalidating a given point of view. Indeed, other educators like Eulie (1988) equate Dewey's work with critical thinking.

Reflection is also associated with problem-solving. Many writers on problem-solving, particularly those from the field of mathematics and physical sciences (Derry and Murphy, 1986) believe that Dewey's reflective thinking, hinged on "scientific method," is about problem-solving in the sense it is used in those subjects. Such is the view of problem-solving or reflective thinking held by most behavioral and cognitive psychologists. Reflective Teaching, a teacher education program designed by Donald R. Cruickshank (1991), seems to be based on the notion of problem-solving of the behaviorist type. In this program Cruickshank also uses Dewey's work to justify the rationale of his approach. There is tremendous confusion about how different people view and use Dewey's ideas on thinking. Psychologists and educators in different and even totally opposed camps use Dewey's works to justify their stances and rationales.

Reflection-in-action

Schon (1983; 1987) has identified *reflection-in-action* besides *reflection-on-action*. Grimmett and Erickson (1988) find that Schon's work is also based on Dewey's notions of reflective thinking. Bullough (1989) notes that Schon's conception of refection-in-action "is essentially an amplification of Dewey's notion of reflection" (p. 20). According to Schon, reflection-in-action is "the thinking what they [practitioners] are doing while they are doing it" (1987, p. xi), and involves an action which is generated and tested through "on-the-spot experimenting" (1983, p. 141). On the other hand, reflection-on-action involves an action planned on the basis of a post-hoc thinking and deliberation. For Schon, both types of reflection involve some form of experimentation in which practitioners attempt to create meaning of the problematic aspects of a practice situation through "problem setting" and "problem solving."

Schon advocates a professional practice in which there is a shift in emphasis from "problem-solving" *per se* to problem setting or "problem posing." That is to say, he proposes moving from a rational process of choosing from among possibilities that best suit agreed-upon ends, to a situation that opens up for contestation and debate the nature of those decisions, the ends to which they are to be directed, and the means by which they are achievable (Schon, 1983). Rather than relying upon discipline-based knowledge, the scene, according to Schon, needs to be characterized by the application of practitioner knowledge acquired from previous particular cases. This amounts to a quite dramatic shift:

from a position where scientifically derived knowledge was deemed superior to a circumstance in which artistic and intuitive knowledge may have a claim to being equally appropriate; from an *a priori* instrumental view of knowledge to one that reflects knowledge as being tentative and problematic; and from a view that presupposes answers to complex social questions to one that endorses the importance of problem posing and negotiated resolution (Smyth, 1986; 1989).

Reflective Thinking Becomes Inquiry

As noted earlier, Dewey (1933) saw "scientific method" as "reflective thinking." Tanner (1988) notes that it seems that Dewey realized later that the term "thinking" carried some heavy baggage; it was associated in the minds of most people with exclusively *mental* activity. This reason may be why Dewey substituted the term *inquiry* for *reflective thinking* in his later work, Logic: The Theory of Inquiry (Dewey, 1938). Geiger (1958, pp. 89-90) points out that "inquiry" was first used by Charles Peirce to describe the activity engaged in to overcome a situation of doubt. Geiger notes that (and it seems Dewey knew well) "inquiry" seems to connote something more active and operational than does "thinking." It is a term broad enough to include all that goes on in the transformations instituted to solve a problem. Tanner (1988) observes that, in the perspective of history, the change in Dewey's terminology does not appear to have made much of a difference. The process of inquiry is still viewed by many people as belonging to physical sciences alone, as it was viewed in Dewey's time. Indeed, some of my participants were surprised to see me talk about an inquiring mind in relation to social sciences. It seems that some of the confusion involved in the use of the terms "problem-solving," "scientific method," "reflective thinking," "critical thinking," and "inquiry" emanates from Dewey's own use of these concepts, as he tended to use them interchangeably, or saw them as subsumed under reflective thinking which for him was synonymous with scientific method (Dewey, 1933).

DISPOSITIONS

It has been shown that many people believe that there is a mutual interrelationship between "skills" or "processes" or "operations" and attitudes and values or dispositions. This suggestion is not new. Dewey (1933), writing about "The Union of Attitudes and Skilled Method," argues that what we need

> is to cultivate those attitudes that are favorable to the use of the best methods of inquiry and testing. Knowledge of the methods alone will not suffice; there must be the desire, the will, to employ them. This desire is an affair of personal disposition. But on the other hand the disposition alone will not suffice. There must also be understanding of the forms and techniques that are the channels through which these attitudes operate to the best advantage (pp. 29-30).

Neglecting dispositions that distinguish mechanical problem-solving from genuine inquiry action is most likely to result in routine action. "Not the thing done, but the quality of mind that goes into the doing, settles what is utilitarian and what is unconstrained and creative" (Dewey, 1933 p. 215).

Dewey (1933) identified three key attitudes as prerequisites to inquiry. The first is *open-mindedness* by which he means freedom from prejudice, partisanship, and such other habits as close the mind and make it unwilling to consider new problems and entertain new ideas. "It includes an active desire to listen to more sides than one; to give

heed to facts from whatever sources they come; to give full attention to alternative possibilities; to recognize the possibility of error even in the beliefs that are dearest to us" (p. 30).

The second is the attitude of *wholeheartedness* or sincerity, which emphasizes the interest in what one is doing. For, "when anyone is thoroughly interested in some object and cause, he throws himself into it; he does so, as we say, 'heartily' or with a whole heart" (p. 31). A genuine enthusiasm is an attitude that operates as an intellectual and moral force.

The third attitude is that of *responsibility*, by which Dewey means careful consideration of and being responsible for the consequences of one's actions. "To be intellectually responsible is to consider the consequences when they follow reasonably from any position already taken. Intellectual responsibility secures integrity, that is to say, consistency and harmony in belief" (p. 32).

Figure 7: Dispositions

Beyer (1988, p. 49) summarizes the following dispositions, which have been suggested by Robert Ennis, David Krathwohl and others:

- Seek a clear statement of a problem or question.
- Question the assumptions on which problems or theses are based.
- Deliberately examine a variety of viewpoints.
- Use credible sources.
- Seek and give reasons and evidence in support of a claim.
- Be open-minded.
- Willingly change a position or judgment when evidence and reasons so warrant.
- Judge in terms of situations, issues, purposes, and consequences rather than in terms of fixed, dogmatic precepts or emotional, wishful thinking.
- Suspend judgment when appropriate/sufficient evidence and reasoning are lacking.
- Persist in carrying out a thinking task.
- Be objective.
- Be slow to believe; exhibit a healthy skepticism.
- Seek a number of alternatives after an apparently acceptable alternative has been proposed.
- Secure as much information as possible before making a judgment.

Figure 7 consists of dispositions that have been suggested by Robert Ennis, David Krathwohl and others (Beyer, 1988, p. 49). It can be noted that Dewey's three dispositions and his other ideas are included in this list. Some of the components of this list are also included in Figures 1 to 6 as cognitive processes, a tendency which causes further conceptual confusion.

Another observation from Figure 7 is that it includes "objectivity" but not "subjectivity" as a thinking disposition. Indeed most dispositions suggested by behavioral and cognitive psychologists and neuroscientists are those which do not violate the critical principles of "scientific rationality" or instrumental reason. The moral, ethical, economic, and political dispositions related to justice, equality, dignity, and human rights and freedoms are seen as irrelevant and contaminating the process of scientific inquiry.

The separation of *objectivity* and *subjectivity* is unrealistic because both are dialectically interlinked (Mbeo, 1975; Freire, 1982). Freire has this to say regarding the dialectical relationship between the two concepts:

> The concrete reality for many social scientists is a list of particular facts that they would like to capture; for example, the presence or absence of water, problems concerning erosion in the area. For me, the concrete reality is something more than isolated facts. In my view, thinking dialectically, the concrete reality consists not only of concrete facts and (physical) things, but also includes the ways in which the people involved with these facts perceive them. Thus in the last analysis, for me, the concrete reality is the connection between subjectivity and objectivity; never objectivity isolated from subjectivity. If I came to the United Republic of Tanzania to do research, I know this reality completely only to the extent that I understand the dialectical relation between the subjectivity and objectivity in this area, that is, when I begin to know how people in this area perceive themselves in their dialectical relationships with the objectivity (Freire, 1982, p. 29).

Subjectivity and objectivity are inseparable human traits; what is objective must as well be subjective to some degree and vice versa. Recognition of subjectivity as a central thinking disposition legitimizes the questions of right and wrong conduct and good and bad character in a culture (Taylor, 1972; Rawls, 1971), questions which have roots in some conception of economic and social justice, to become essential constituents of an inquiring mind. Inquiry cannot be unethical, apolitical, value-free, ahistorical and acultural because it is a way of living, an idea about how human beings of diverse individual and group attitudes, values and interests live. And inquiry is both a means and an end to this living.

It is probably this concern that may have led Van Manen (1977) to identify three levels of reflectivity. At the first level, the dominant concern is with the technical application of knowledge for the purpose of attaining given ends. The ends themselves are not questioned but are taken for granted as worthy of pursuance. Practical action is defined at this level solely according to criteria of technological progress - economy, efficiency, and effectiveness. This is the level to which Dewey was largely reacting in his works as "routine action, " a level rooted in behaviorism.

The second level of reflectivity is based on a conception of practical action where the problem is one of explicating and clarifying the assumptions underlying practical affairs and of assessing the consequences to which action leads. This is the level of reflectivity addressed by Dewey as "reflective action." While this second level of reflectivity enables one to transcend the purely instrumental concerns of a technocratic rationality, another level of reflectivity becomes necessary to enable deliberation over the worthwhileness of an action's goals and principles. Thus the third level incorporates moral, ethical, and political principles and democratic criteria such as justice, equality, and freedom into practical action.

Zeichner (1981-1982) has broadened the scope of Dewey's (1933) attitude of *responsibility* to incorporate Van Manen's third level of reflectivity in order to redress a weakness in Dewey's thinking. Zeichner finds Dewey's work to be problematic in at least some respects in his writings on teacher education and reflective action:

> For example, Dewey's almost exclusive emphasis on educational and scientific principles as guideposts for action is based solely on an empirical-analytical conception of science and does not in itself guarantee that the action that follows and the ends that are sought will be moral or ethical. One cannot make the necessary connections between the level of the classroom and the structure and distribution of power and resources in the wider society from Dewey's framework alone (Zeichner, 1981-1982, p. 17).

Thus the expansion of Dewey's framework attempts to broaden the scope of reflection to include ethical, moral and political principles.

While one extreme notion of thinking confines it to the technical model, the other extreme sees it solely in terms of virtues or dispositions. Schrag (1988) illustrates this latter stance. Schrag distinguishes between "kills" and "virtues" and proposes that the educator's focus "*ought to be on the development of the virtue or character trait of thoughtfulness*" (p. 8). He states:

> In contrast to the view that thinking comprises a set of general skills, I propose that we consider the character trait of thoughtfulness to be the hallmark of the good thinker. What contrary inclinations must the thoughtful person grapple with? There are two: impulsiveness and rigidity. The good thinker avoids precipitous action and avoids getting "stuck" in a stereotyped response. He or she is deliberate as well as flexible (p. 14).

Schrag believes that skill learning involves very little or no thinking. For him only virtues or character traits involve thoughtfulness. This view, however, separates the "technical" and the "thoughtful," body and mind. This old dualistic philosophy which sees skill as thoughtless can hardly be helpful in the understanding of the nature of an inquiring mind which roots in *praxis* (Aoki, 1983).

A distinction made by Daniels (1975) between *technical skills* and *orientational skills* helps to illustrate that not *all* skills are mechanistic. Daniels defines "technical skills" as those techniques, procedures, or ways of accomplishing things that can be directly developed through deliberate training. This is the usual and instrumental way of conceiving of skills, a conception adopted by Schrag (1988) throughout his work. This is the view of skill that has received most of the attention of those concerned with fostering thinking in schools and teacher education institutions under the current thinking movement. Daniels defines "orientational skills" as the specific ways in which an individual looks at the world, a set of cognitive processes that make up the individual's perspective or world view (e.g. receptivity) and are not directly trainable in the instrumental sense. Van Manen (1977, pp. 210-213) has further developed this concept of orientation. This distinction at least shows that "skill" is also a contentious concept in the "thinking" or "inquiry" literature. Ultimately, however, a balanced view of the concept of an inquiring mind needs inclusion of both technical and non-technical skills and dispositions. The danger is to reduce thinking merely to the technocratic and mechanical consideration. Dewey's (1933) suggestion of integrating skills and dispositions needs to be taken very seriously.

A PHILOSOPHICAL PERSPECTIVE

The purpose of this section is to try to situate what has been discussed so far in this chapter into some form of philosophical perspective. Three philosophical schools of

thought are observed (Nussbaum, 1989): *empiricism-positivism, rationalism* and *constructivism.* Constructivism is today generally accepted as a philosophical stream, and it is increasingly influencing school and teacher education programs (Tom, 1985; Henderson, 1992; Klenz, 1987; Zeichner and Tabachnick, 1991; Smyth, 1989, 1992). Nussbaum illustrates these schools of thought with specific philosophers, some of whose ideas overlap. Bacon, Hume, Locke, Comte and Hempel are seen as belonging to the field of empiricism-positivism; while Descartes and Kant's thinking is seen as representing rationalism. Under constructivism Nassbaum includes Popper, Lakatos, Toulmin and Kuhn.

Empiricism and rationalism were deeply divided regarding the most substantial assumptions about the sources of and the methods for validating knowledge. The former assumed that valid knowledge was arrived at primarily by evidence of the *senses.* The latter assumed that valid knowledge was realized primarily by the power of the *intellect.* Nevertheless, both schools held that once knowledge is acquired, it can be described in absolute terms such as "true," "proven," "confirmed," "right," "correct," "rigorous" and "final." Nassbaum finds that in the historical debates from the seventeenth to the nineteenth century, the empiricist view seemed to overpower that of the rationalists as science tended to be seen almost entirely as an empirical endeavor. The empiricist-positivist view was therefore popular among scientists and thinkers until the beginning of the twentieth century.

In the field of education, Tom (1985, 41) finds that throughout the twentieth century, the dominant position on the ontological status of educational phenomena (the question of how "real" educational phenomena are) among all varieties of teacher educators is that phenomena are as natural as rocks and trees. Assuming that educational phenomena are natural makes them stable enough so that employing the conceptual and methodological tools of social science can ultimately lead to the discovery of enduring regularities. Thus, the social sciences, no less than the natural sciences, can develop a *solid base of knowledge* on which to ground intelligent practice. It is this same assumption held by behaviorists and most cognitive-developmental psychologists. In the most straightforward view of the natural character of educational phenomena, the researcher discovers *lawlike* regularities which the practitioner converts into rules or principles of practice.

Tom (1985) notes that in the teacher effectiveness tradition, one affirmation of the natural character of educational phenomena rooted in empiricism and positivism is *process-product research.* In this approach, an attempt is made to find relationships between specific teacher behaviors (process) and student outcomes (product). Process-product researchers believe that the phenomena they are exploring are natural and therefore stable and that under intensive analysis and experimentation these phenomena will yield "scientific generalizations and trends." Of course, for a long time social sciences and education have been influenced by and indeed adopted the research methods of positivist empirical research paradigms.

Nussbaum (1989) notes that in the beginning of the twentieth century, the drastic changes in the ideas of modern physics started to undermine the belief that science could make valid "absolutist" claims. Philosophical, psychological and logical arguments have accumulated against the possibility of ever proving or confirming knowledge. Also Tom (1985, pp. 41-42) notes a similar shift in the field of education, where considerable disenchantment has developed with the assumption that educational phenomena are natural. The positivist empirical process-product research has been found to be an inadequate account not only for pedagogy but also for educational research in its broadest sense.

In addition, social theorists have increasingly come to believe that social science knowledge is historically, morally, ethically and politically bounded, that "principles of

human interaction cannot readily be developed over time because the facts on which they are based do not generally remain stable" (Gergen, 1973, p. 310). In the wake of such major developments as the positivism debate in German sociology (Adorno, 1976), the emergence of phenomenological and hermeneutic forms of social inquiry (Gadamer, 1981; Habermas, 1978; Thompson, 1981), the growing influence of non-Western (Kothari, 1987; Nandy, 1981; 1989) and feminist (Belenky et al., 1986; Farganis, 1986; Harding, 1986) epistemological thought, or the post-structuralist and post-modernist debates (Deleuze and Guattari, 1987; Foucault, 1971; 1972; Lyotard, 1984), the supremacy of the paradigm of the natural sciences and its applicability to social inquiry has been thoroughly undermined. This process has led to a conception of knowledge that is more differentiated and in which the traditional tenets of scientific propriety have given way to more specific and less monolithic standards for the validation of knowledge.

These and related concerns and trends in both natural and social sciences have led to the proposal that "knowledge" is *not* discovered but that it is a *human construction* and is always subjective (Nussbaum, 1989, p. 531; Tom, 1985, p. 43). In education, too, educators have seen educational phenomena not so much as naturally occurring events in need of analysis and understanding but as social constructions in need of thoughtful and wise design efforts. Education is seen as a "a human invention, a construction, a cultural institution designed and built by men" (Ebel, 1967). Thus constructivism replaces the "absolutism" of the empiricist-positivist and rationalist traditions.

Nussbaum (1989) finds that constructivism presupposes that theory precedes observations, and that observations can be selected and conducted only through theoretical expectations (this particular assumption was also held by the rationalists). Therefore, our own constructed theories *determine* how we perceive the world. In this sense, they constitute a "prison" in which we are caught. The idea that we are prisoners of our own mental frameworks had already appeared in Kant's philosophy (Nussbaum, 1989). However, the constructionist view differs from the absolutist notions of Kant in assuming that we can always break out of our framework, by constructing a new one if we try.

While all constructivists hold that theories are bold speculations proposed by *creative* minds, they differ in the manner in which a supposedly better theory is to be selected. Some argue that the selection should and does occur only on the basis of *inner* disciplinary criteria (e.g., rational-logical, empirical). In the most extreme form of this approach, proposed first in 1934 by Popper (1959), an intellectual effort was made to identify the *rules* of selection based on deductive logic. Others argue that the selection occurs under the influence of *outer* disciplinary factors (e.g., the personality of the researcher, socio-psychological processes in the intellectual community, prevailing societal conceptions, institutional conditions and political pressures) as well as *inner* disciplinary factors. According to this view there are no normative criteria for selecting theories. Kuhn (1970) represents the extreme form of this latter approach. Lakatos (1970) and Toulmin (1972) represent an intermediate perspective. Thus there are variations of philosophical positions within constructivism.

In terms of *rationality*, the classical position of empiricism-positivism and rationalism conceives "rationality" as the *formal procedures* by which humans exercise universal-absolute-logical rules to arrive at decisions (on routine situations or in inquiries to gain knowledge). Constructivists conceive of "rationality" as the actual process by which humans change their ideas, concepts and course of actions, while influenced by socio-psychological and professional factors. These value-oriented factors cannot be weighed in an absolute manner when making a judgment (Nussbaum, 1989 p. 533).

Influence of Philosophical Views on Psychology

It has been indicated above that empiricists-positivists understand "knowledge" only as that which has been *confirmed* through careful observations and logic. This knowledge must be accumulated inductively. Nussbaum (1989, p. 535) finds that *behaviorism* is the psychological stream that continued the empiricist-positivist line. B. F. Skinner's teaching machines and programmed learning demonstrated its application to education. A similar kind of application is the work of Gagne (1965; 1985) on designing instruction based on "hierarchy of competencies."

For Kantian rationalists, knowledge is arrived at by the mind through *a priori* mental *structures*. Since these structures include categories of "final logic," presented as a divine gift, appropriate application of these categories should lead us to approximate "true" knowledge. Nussbaum (1989) finds that Piaget and his followers are the representatives of the Kantian school in the field of psychology and education. Piaget was probably the first to propose the parallelism between the history of science and children's conceptions about natural phenomena. For Piagetians, the reasons for differences between students' conceptions are either that they are at a developmental stage during which the required logical operations have not yet been developed, or that they simply misapply logical cognitive operations. Since for Piagetians (following Kant) *logic* is absolute, universal, and the primary indicator of rationality, students' incorrect concepts and thinking are basically *mis*conceptions, and they should be handled by better logical treatment.

The descendants of those philosophies (behaviorists and Piagetian cognitive developmental psychologists) continued to be very much alive among physical and social science educators in the 1960s and even today. As noted earlier, even cognitive psychologists of the "information processing" movement have been influenced by these philosophies.

Constructivist philosophy emphasizes teaching and learning approaches that would perceive students as *active thinkers* who construct personal meanings that can in turn help them to form conceptual frameworks or "paradigms" of their own making, and turn the existing knowledge into problematic situations that have to be inquired into. As Tom (1985) puts it,

> If education is seen as a social construction, then the fundamental issue is less inquiry into the dynamics of this construction than it is inquiry into whether the current construction serves human needs and satisfies important human purposes. To adopt a view of educational phenomena as socially constructed is to see the entire educational system as potentially part of the arena of the problematic (p. 42).

SUMMARY

This chapter attempted to explore the problem of defining the concept of an inquiring mind in order to establish some elements which may be used as the basis to design educational programs that can foster an inquiring mind. Four sources of insights into the nature of this concept were reviewed. These included the behavioral tradition, the cognitive tradition, the cognitive developmental tradition, and the philosophical perspective. The review shows that people have different and contradicting views of what constitutes inquiry or elements of an inquiring mind.

The view of "an inquiring mind" held in this study is rooted in constructivism. I believe that constructivism embeds all the elements reviewed in this chapter. These

elements include the so-called "basic" and "complex" thinking processes (problem-solving, critical thinking, creative thinking, decision-making, metacognition, epistemic cognition, reflection), and dispositions. Unlike empiricism-positivism and rationalism, constructivism is active rather than passive, recognizes the legitimacy of subjectivity as well as objectivity in the conception of "an inquiring mind," and embraces the fact that knowledge is historically, morally, ethically, politically, and culturally bounded. To hold the view of constructivism is to believe that every phenomenon is problematic, should not be taken for granted, and has to be subjected to inquiry. More notions on constructivism are explored in chapter three.

CHAPTER THREE

AN INQUIRING MIND: THE PROBLEM OF DEVELOPMENT

INTRODUCTION

While chapter two has attempted to explore the nature of an inquiring mind, the focus of this chapter is to discuss some issues and concerns related to the question of *developing* an inquiring mind in schools. The key question addressed is: *What does it mean to develop an inquiring mind?* It is obvious that the development of an inquiring mind in schools is directly related to the type of teaching that takes place in those schools. This relationship between what happens in school and how students respond, in turn, has implications on how teachers are prepared in teacher education institutions. Although teachers are not the only determinant of the quality of teaching and learning, they are nevertheless the most decisive. Indeed, this is why teacher education institutions exist. Thus, the central issue in this chapter is to examine those models or paradigms, and their underlying metaphors, that are likely to influence the efforts of preparing a teacher and a teacher educator who is likely to foster an inquiring mind.

While a discussion of specific methods of teaching or "teaching strategies" and "teaching tactics" is significant, it will not be given emphasis in this chapter. It is assumed that to uncover the instructional activities which are most appropriate for the development of an inquiring mind key psychological, philosophical, political and other issues underlying the teaching activity must be tackled and understood first. Most of these issues in which methods of teaching are rooted cut across schools and teacher education institutions. For example, an educator whose frame of reference is the belief that lecturing is the best method of teaching is likely to lecture learners be it in primary or secondary school or teacher education institution. The focus of this chapter is to explore the frames of reference or beliefs that determine teacher activities along with some discussion of methods of teaching where appropriate. Specifically, the chapter examines eight paradigms of teacher education and teaching. An attempt is made to establish the relationship between them and to ascertain the appropriateness of each of them to the development of an inquiring mind. A number of propositions are made regarding the paradigm and assumptions that are most suited to the reaching of this goal.

PARADIGMS OF TEACHER EDUCATION AND TEACHING

As indicated above, an understanding of what it means to develop an inquiring mind requires an exploration of a number of paradigms in teacher education and teaching that embed key metaphors of teaching and learning. Zeichner (1983) identifies four alternative paradigms of teacher education which also have a bearing on teaching and learning in schools: *behavioristic* teacher education, *personalistic* teacher education, *traditional-craft* teacher education and *inquiry-oriented* teacher education. More recently, Zeichner and Tabachnick (1991, pp. 3-9) have identified four traditions of reflective teaching practice: the *academic tradition* that stresses the representations of subject matter to students to promote understanding; *social efficiency tradition* that emphasizes the intelligent use of generic teaching strategies suggested by research on teaching; *developmentalist tradition* that stresses the learning, development and understanding of students; and *social reconstructionist tradition* that stresses the social and political conditions of schooling and issues of equality and justice.

Nuthall and Snook (1973) have identified three "models" of teaching. They include *behavioral control model, discovery-learning model,* and *rational model.* This third model

is what is termed "academic tradition" or "the academic paradigm" which is grounded in the traditional academic disciplines of knowledge (Nuthall and Snook, 1973, p. 68; Zeichner, 1983, p. 3). This paradigm is what Eisner and Vallance (1974) have termed *academic rationalism.*

Lanier (1982, p. 13) identifies three teacher education paradigms: (1) *The teacher as an effective person,* i.e., the most important pedagogical skills are embedded in unique personal qualities and human characteristics. (2) *The teacher as a skilled performer,* i.e., the most important pedagogical skills are embedded in the behavioral performance of smoothly orchestrated routines and actions. (3) *The teacher as a professional decision maker,* i.e., the most important pedagogical skills are embedded in the exercise of informed human judgment that is grounded in a substantive body of formal and practical knowledge concerning the human endeavors of teaching, learning and schooling. Sergiovanni (1986) also identifies the "art" or "craft" and "applied science" paradigms. Another way of viewing teaching is in terms of *teacher roles.* Thus, Meighan (1988, pp. 27-31) identifies two categories of such roles: *authoritarian* and *non-authoritarian* roles.

There are possibly several other such conceptualizations which sum up major concerns of educators in teaching. The following paradigms drawn from the above suggestions will be addressed in the discussion that follows: (1) *personal qualities or characteristics;* (2) *behavioristic paradigm;* (3) *academic rationalistic paradigm;* (4) *discovery paradigm;* (5) *personalistic paradigm;* (6) *traditional-craft paradigm;* (7) *teaching roles*; and (8) *inquiry-oriented paradigm.* It seems that "social efficiency" tradition identified by Zeichner and Tabachnick (1991) is a variation of behavioristic and possibly discovery paradigms. Although developmentalist tradition seems to be related to discovery, is also associated with personalistic paradigm. The reconstructionist tradition is here identified with inquiry-oriented paradigm.

The central notions in these eight schemes are obviously not totally separate or mutually exclusive. Each conception is not distinguished by a total neglect of the other but by the salience of its point of interest; there is a lot of overlap among them and indeed the list could be shorter. However, each of these paradigms is discussed in order to explicate certain questions and issues that are of particular interest to each of them. It will be found that some of these paradigms are less supportive of the development of an inquiring mind than others due to their underlying various psychological, philosophical and political positions.

PERSONAL CHARACTERISTICS OF TEACHERS

The concept of *ideal teacher* in terms of personal characteristics seems to have moved from purely qualitative and descriptive focus to quantitative emphasis. Borich (1988) notes that the early definition of a good teacher was a good person - someone who met the community ideals for a good citizen, a good parent, and a good employee. Teachers were judged primarily on their *goodness* as people, not on behavioral performance in the classroom. They were expected to be honest, hardworking, generous, friendly, insightful, considerate and to reveal these qualities in their classrooms by being organized, disciplined, authoritative, and dedicated. The quantitative movement in education meant that this definition of ideal teacher lacked clear, *objective standards of performance* that could be consistently applied across teachers and that educational institutions could use in *training* future teachers.

The need for objective assessment of teacher effectiveness led to the identification of characteristics or attributes of the good teacher. Thus as Lanier (1982) and Haysom (1985) point out, the predominant focus of the early research on teaching was on personal

characteristics themselves. It was assumed that if these personal qualities could be identified, measured and shown to be scientifically valid predictors of effective teaching, then they could be used appropriately for screening, selection, and retention purposes.

The more or less standard approach to inquiry in these early years was for prospective or practicing teachers to be tested, surveyed and/or interviewed for purposes of describing their backgrounds, personalities, attitudes, values or dispositions, understandings and beliefs. Supervisors' judgments were used to identify the more and less effective teachers and then teachers' personal characteristics were examined for comparison and contrast.

A study reported by Robertson (1957) included the following characteristics: (1) Ability to interest; can hold a group, makes work meaningful. (2) Temperament; poised, not easily put out, stable. (3) Enthusiasm for subject; can communicate a devotion. (4) Multiplicity of interest; brings outside interests to bear in teaching, grasps principles and aims of subjects. (5) Ability to organize a class; can supervise all activities, manages. (6) Interest in people; knows the pupils, seeks to understand and help them. (7) Good appearance; well dressed and groomed, likely to appeal to young.

In his study, Ryans (1960) concluded that effective teachers were fair, democratic, responsive, understanding, kind, attractive, responsible, steady, poised and confident. Ineffective teachers were described as partial, autocratic, aloof, restricted, harsh, dull, stereotyped, apathetic, unimpressive, evasive, erratic, excitable, and uncertain (Cooper, 1990). Lanier (1988, p. 15) notes that student teaching evaluations often included ratings on such personal qualities as dress, grooming, punctuality, humor, tact, poise, commitment, friendliness, vitality, health, and acceptance of criticism. Moral character and respectable conformity to predominating social values were similarly emphasized.

This approach to teaching and teacher education was seen as unproductive and constituting untrustworthy knowledge (Lanier, 1982 p. 15). Mshana (1992) believes that one of the problems with this approach is that these characteristics are not uniquely desirable for teachers only; they are also desirable for other people who are involved in human interaction. The implication of this claim is that only those aspects which are accepted by education "experts" as *unique* to teaching are the ones that have to be the concern of educators, that is, "specific knowledge and practices of teachers which are required in order to achieve the intended learning outcomes" (p. 70).

Although most discussions in education view this paradigm as moribund, it is in fact very much alive and indeed desirable. True, some of the characteristics no longer count, but others are still crucial to teaching and to the qualities of a "good teacher." Characteristics such as enthusiasm, acceptance of criticism, helping students, humor, fairness and others are still valued by both educators and students themselves. Indeed, Henderson (1992) believes that "the first characteristic of reflective teaching is the ethic of caring" (p. 2) or love for children and being able to empathize with them. Van Manen (1992) urges educators to view pedagogy as virtue. Teachers as human beings have indeed to behave like normal humans and their actions should not be reduced merely to "specific knowledge and practices" or *a priori* "rules" and "principles" dictated to them.

BEHAVIORISTIC PARADIGM

This paradigm rests upon the foundations of *behavioral psychology*. As observed in the last chapter, behaviorism itself is rooted in empiricism and positivism, and emphasizes the development of specific and observable behaviors or skills of teaching which are assumed to be related to student learning. Nuthall and Snook (1973) describe

this paradigm as "behavior-control," and "behavior-modification," a movement began by Skinner's (1968) introduction of teaching machines and programmed instruction. The purpose of the movement was to revere the potential role of psychological science in education. By early 1950s Skinner (1954) was claiming that the teaching machine had introduced considerable power of scientific psychology into the *management* of teaching. Thus, behind Skinner's teaching machine lay the concept of a *true science of instruction* with a vision of the boundless advances that only an empirical science could bring.

Nuthall and Snook (1973) note that this vision caught the imagination of many educators and coincided with the interests of a further group of psychologists with experience in *military training* research. Sharing a common background in behavioral psychology, this latter group believed that, with the application of modern technique of job-analysis, psychological research methods could contribute directly to the improvement of classroom instruction. While Skinner pursued his own specific theoretical concerns, others took over his vision of education as the most important branch of scientific technology and attempted to prescribe the methods of investigation and kinds of knowledge and instructional materials which would make this a reality (Honig, 1966; Nuthall and Snook, 1973).

Nuthall and Snook (1973) use the label "behavior-control" because underlying many of the concepts and ideas expressed by the protagonists of behaviorism is the notion of teaching as a *method of controlling the behavior of students and the conditions of learning*. Teaching is approached as a *management* procedure which ought to be accomplished as quickly and as efficiently as possible in businesslike manner. *Objectivity, precision* and *economy* are the prime methodological virtues. For Skinner the validity of his argument rests on the demonstration of his ability to control behavior.

In this context the initial emphasis is not on teaching as such but on the objectives of the teaching task. Behaviorists claim that the essential task of teaching is to get students to perform precisely delineated responses, hence the practice of specifying in advance the knowledge, skills and competencies to be taught in precise behavioral terminology. The progress which was evident in the psychological laboratory had been dependent on precise behavioral specification, and progress in teaching would depend on the same kind of precision.

Zeichner (1983. p. 4) notes that, according to this paradigm, the criteria by which success is to be measured are made explicit and performance at a prescribed level of mastery is assumed to be the most valid measure of student or teacher competence. "Underlying this paradigm is a metaphor of 'production' (Kliebard, 1972), a view of teaching as 'applied science' and a view of the teacher as primarily an 'executor' of the laws and principles of effective teaching (Tom, 1980a)" (Zeichner, 1983, p. 4). The teaching and learning context is construed as accepted as given and unproblematic. Learners are seen as passive receptacles and recipients of specialist knowledge.

Lanier (1982) discusses educational research trends in behavioral paradigm, and as Tom (1985), Grimmett (1982) and others have pointed out, this view of teaching and learning is associated closely with the *competence-based* teacher education movement. Educational research characteristic of this movement "emanates from process-product paradigm which assumes a positivistic and experimental view of science and scientific research. Here, the emphasis is on observable or directly measurable behaviors or actions" (Grimmett, 1982, p. 48). This is the view of "nomothetic" research, used for generalizing across classrooms and teachers.

Sergiovanni (1986) notes that the study of a discipline or profession in order to identify laws and establish irrefutable principles that provide lawlike relationships is science in its pure form. The intent is to advance science for its own sake, not to improve practice. Those who apply this science to practice are "applied scientists." They perceive their practice as the application of standardized protocols according to laws or lawlike principles. Professions tend to seek this form of practice since it has the *prestige* of "science" associated with it. "Pure" or direct application of research on teaching would be an applied science approach to teaching and learning.

Dewey (1929) noted the danger of such a *scientific attitude* which is in fact the cause of and basis for *recipe culture* of mere application of given scientific knowledge and skills with maximum efficiency without thoughtful reflection upon them. Dewey writes:

> Prospective teachers come to training schools, ... with such ideas implicit in their minds. They want very largely to find out *how to do* things with the maximum prospect of success. Put baldly, they want recipes. Now, to such persons science is of value because it puts a stamp of final approval upon this and that specific procedure. It is very easy for science to be regarded as a guarantee that goes with the sale of goods rather than as a light to the eye and a lamp to the feet. It is prized for its prestige value rather than as an organ of personal illumination and liberation. It is prized because it is thought to give unquestionable authenticity and authority to a specific procedure to be carried out in the school room. So conceived, science *is* antagonistic to education as an art (Dewey, 1929, pp. 15-16).

Science, so conceived, becomes the cause of and basis for imposition and installation in educational institutions of scientific prescriptions and routine actions. The behavioral-control paradigm also embraces the reductionist philosophy of behaviorism.

ACADEMIC RATIONALISTIC PARADIGM

The academic tradition, termed by Eisner and Vallance (1974) as *academic rationalism*, has historically emphasized the role of the so-called liberal arts and disciplinary knowledge in school and teacher education programs. Those embracing this paradigm include people like Phenix, King and Brownell, Hirst, and organizations like the Council for Basic Education (CBE) and others who base the curriculum on the dictates of the doctrine of formal disciplines of knowledge. They believe in the *transmission of the cultural heritage*. For them, the cultural heritage is tantamount to knowledge found in the established disciplines which are believed to be "the most powerful products of man's intelligence" (Eisner and Vallance, 1974, p. 12). To become educated means to be able to read and understand those works that the great disciplines have produced, a heritage that is at least as old as the beginnings of Greek civilization. The curriculum, it is argued, "should emphasize the classic disciplines through which man inquires since these disciplines, almost by definition, provide concepts and criteria through which thought acquires precision, generality, and power; such disciplines exemplify intellectual activity at its best" (Eisner and Vallance, 1974, p. 12).

Phenix (1968) claims that "all curriculum content should be drawn from the disciplines; only knowledge contained in the disciplines is appropriate to the curriculum" (p. 133). King and Brownell (1966) take the school as "the home of the ways of knowing and organizing itself to foster and cherish knowledge. Such a role requires it separation from the immediate demands of society, from the concrete and practical, for it analyzes, criticizes and theorizes" (p. 33). Education, according to Hirst (1965) "is determined in scope and content by knowledge itself and is concerned with the development of the mind"

(p. 125). The CBE (Tanner and Lindgren, 1971) advocates "a decrease in vocational education at the secondary school level. Vocational courses are without intellectual content and are provided by educators who have not themselves received a very strong training in the liberal arts" (p. 66). According to academic rationalists

> To construct a curriculum that includes 'practical' learning such as driver training, homemaking, and vocational education dilutes the quality of education and robs students of the opportunity to study those subjects that reflect man's enduring quest for meaning. The wise schoolmaster knows that not all subject matters are created equal, and he selects the content of his educational program with this principle in mind (Eisner and Vallance, 1974, p. 12).

Thus, academic rationalists not only advocate the teaching and learning of knowledge for training of the mind, but also view it as existing in a *hierarchy of status* of disciplines. Indeed, Goodson (1983) discusses such hierarchies in relation to academic subjects. The academic rationalists also believe that vocational education is "unintellectual" and "thoughtless" education. This belief seems to underlie the thinking of people who view "skill" in only instrumental manner (Schrag, 1988). Resistance by some educators and policy makers against vocational programs in Tanzania and elsewhere is partly due to this belief.

A distinction can be made between "disciplined knowledge" and "non-disciplined knowledge" or, as Goodlad would have it, "funded knowledge" and "conventional wisdom" (Aoki, 1974, p. 4). "Funded" or "disciplined" knowledge is that knowledge found in the "representations" of the "real-life" environment. Examples of such *displays* include maps, books, pictures, diagrams, models, taped and other recorded or coded information, actions and events that convey to a person some kinds of knowledge, skills, processes, attitudes and values from and about the real-life environment. These are also called *secondary sources* of content. Materials existing in their untransformed, indigenous forms or "original" states such as samples of flora and fauna, fossils and relics, and other sources and forms of original works and information, are not part of the funded or disciplined knowledge because they are chunks of the real-life environment and can still be transformed into funded knowledge. These are also called *primary sources* of content.

A detailed discussion of this distinction has been made by Mbeo (1975, pp. 39-91). Its significance lies in the observation that academic rationalism advocates the teaching and learning primarily of disciplined knowledge funded by subject specialists, and denies teachers and learners the opportunity to transact with and transform the unfunded, indigenous sources of knowledge. Mazrui (1984) discusses this problem in relation to African university education. In ESR policy academic rationalism is indeed criticized trenchantly. It says:

> our present system encourages school pupils in the idea that all knowledge which is worthwhile is acquired from books or from "educated people" - meaning those who have been through a formal education. The knowledge and wisdom of other old people is despised, and they themselves are regarded as being ignorant and of no account. ... Everything we do stresses book learning, and underestimates the value to our society of traditional knowledge and the wisdom which is often acquired by intelligent men and women as they experience life, even without their being able to read at all (Nyerere, 1968, p. 277).

The relationship between academic rationalism and empiricism-positivism was established in the last chapter, but it has also been documented by several other educators. Lillis and Lowe (1987), for example, note that academic rationalism advocated by Hirst (1969; 1974) and Phenix (1964) is a "positivist" epistemology and educational philosophy. These writers find that Hirst and Phenix give a central position in the curriculum to 'knowledge' *per se*, not the knower, with knowledge seen as a reflection of an objective reality of the physical world and possessing an inherent, objective, rational structure. Knowledge is characterized by distinctive concepts, logical structure and methods of inquiry and testing of propositions - a 'scientific method.' These are characteristics of the form itself and, as such, are universal, not related to any particular social organization. Wherever it is practiced the nature of science is the same, determined by its logic and the world external to human experience. Lillis and Lowe find that this universal nature is what Hirst and Phenix find important to teach. "Such interpretations of both "knowledge" and "purpose" of education easily lead to a doctrine of transferability (House, 1979) in which adoption of an educational program developed in one society into another, quite different society, is seen as largely non-problematic" (Lillis and Lowe, 1987 p. 170). Tom (1985) finds that the advocacy of 'disciplined-inquiry' has tended "to bifurcate knowledge and action" (p. 39).

Giroux (1979) also finds the connection between academic rationalism and "positivist pedagogy." He observes that instruction in the classroom is consistent with the principles of positivism:

> In this view, knowledge is objective, 'bounded' and 'out there'. Classroom knowledge is often treated as external body of information, the production of which appears to be independent of human beings. From this perspective, objective knowledge is viewed as independent of time and place; it becomes universalized, ahistorical knowledge. Moreover, it is expressed in a language that is basically technical and allegedly value free. This language is instrumental and defines knowledge in terms that are empirically verifiable and suited to finding the best possible means for goals that go unquestioned. Knowledge, then, becomes not only countable and measurable, it also becomes impersonal. Teaching in this pedagogical paradigm is usually *discipline based* and treats subject matter in a compartmentalized and atomized fashion (p. 277-278).

Giroux (1979, p. 275) also notes that the assumptions of the culture of positivism are embraced fully in the social science curriculum. According to Giroux, the positivist rationality assumed is that: (1) The natural sciences provide the 'deductive-nomological' model of explanation for the concepts and techniques proper for social science. (2) Social science ought to aim at the discovery of lawlike propositions about human behavior which are empirically testable. (3) Social science modes of inquiry can and ought to be objective. (4) The relationship between theory and practice in the social science domain is primarily a technical one, i.e., social science knowledge can be used to predict how a course of action can best be realized. (5) Social science procedures of verification and falsification must rely upon scientific techniques and "hard data," which lead to results that are value free and intersubjectively applicable. Giroux finds that, at the core of this instrumental view, knowledge is prized for its control value, its use in mastering all dimensions of the classroom environment. Indeed, academic rationalism is an educational orientation which serves well the basic assumptions of behaviorism.

Zeichner and Tabachnick (1991, p. 4-5) find that some advocates of this paradigm have modified its original assumptions by developing a "model of pedagogical reasoning" and action and by proposing the professional knowledge base for teaching that includes

three major categories of content knowledge: subject matter content knowledge, pedagogical content knowledge and curricular knowledge. Zeichner and Tabachnick note, however, that this modification notwithstanding, "the standards for assessing the adequacy of the teaching evolve primarily from the academic disciplines" (p. 5).

DISCOVERY PARADIGM

One reason for identifying the "discovery" paradigm is to distinguish it from the "inquiry-oriented" paradigm rooted in constructivism. Nuthall and Snook (1973) and Wittrock (1966) find that proponents of the "discovery-learning model" or "discovery method" (Bruner, 1971) which was later referred to as "inquiry method" (Postman and Weigartner, 1969) and "inquiry teaching" (Beyer, 1971; Zevin, 1973) claimed that the antecedents of their ideas were evident in the writings of J. J. Rousseau, Maria Montessori and John Dewey. Taba (1963) claimed to have identified descriptions of discovery learning dating back to 1904 and Hendrix (1961) claims to have found similar evidence in a book published in 1823. Glaser (1966) claimed that the "inductive method" (which he associated with discovery-learning) was a long-standing procedure recognized in society for its excellence. Suchman (1961) saw it as the "new pedagogy" in which retention was subordinated to thinking and in which the teacher had to abandon the "traditionally directive method" and structure the environment so that the child was led to "exciting new discoveries." Nathall and Snook (1973) find that other people related discovery learning to the Gestalt tradition, while others believed it based on ideas from cognitive psychology, developmental psychology and the study of creativity. The discovery-learning movement that began in the early sixties may be seen as the first or pioneering tier of the current cognitive thinking movement (Pauker, 1987). Names of psychologists who are identified with this first phase include Hilda Taba, Benjamin Bloom and Jerome Bruner.

Bruner's work, and particularly The Process of Education (Bruner, 1960), consisted of the guiding principles of this paradigm that were used to develop the grand discovery-learning programs or projects in the 1960s through 1970s in mathematics and physical sciences and later in social studies and social sciences. These curricula projects adopted a "heuristic," discovery-learning approach which utilized the metaphor "science as search" as their model. The psychologists now identified "learning by discovery" as the most efficient learning strategy and the new courses were immediately given educational respectability.

Throughout Bruner's account, great emphasis was placed on the notion of the *structure* of the subject or discipline, by which he meant a limited number of key principles and ideas which are fundamental to the discipline and can be generalized across numerous specific phenomena within it. Concentrating learning on these fundamentals was claimed to make the subject matter of the discipline more comprehensive and more easily remembered. These fundamentals were sequenced into a hierarchy according to some criteria such as degree of complexity of those ideas and Piagetian theory of readiness according to physical maturation of learners. In geography, for example, the High School Geography Project (HSGP) was based on a "structure of geography" which consisted of the following "hierarchy of concepts:" geographic *facts, scale, spatial distribution, spatial interaction, areal differentiation, and geographic region* (Mbeo, 1975, pp. 63-84).

It can be claimed that the whole discovery-learning movement was basically rooted in empiricism-positivism and rationalism and thus in behaviorism and academic rationalism. The pedagogy used was molded and modeled on scientific method with its assumptions of "pure' and "real" science. Even "social studies" or "social science" curricula projects were discipline-based and thus academic rationalist in nature.

Evidence to show that the discovery paradigm was based on positivist, academic rationalism is partly provided by Bruner (1971) himself. He notes that "the schoolboy learning physics did so as a physicist" (p. 19), and that the curriculum experts - the academics - assumed that students "wanted an expertise in some particular subject matter. Their motivation was taken for granted" (p. 19). Lillis and Lowe (1987) also find the same belief with respect to Nuffield science - that the pupil was allowed "to be a scientist for a day" (p. 168). Bruner (1971) says that the prevailing notion of "rational structuralism" was that "if you understand the structure of knowledge, that understanding would then permit you to go ahead on your own; you did not need to encounter everything in nature in order to know nature, but by understanding some deep principles you could extrapolate to the particulars as needed" (p. 18). Criticizing the movement, Bruner believes that the discovery-learning paradigm "*suffered an excess of rationalism*" (p. 18). Consequently, "good teachers were being driven underground by the prevailing literalism" (p. 18). The authors of the HSGP claimed that its content was apolitical and generalizable across classrooms and teachers (Gunn, 1972).

Since this discovery-learning movement reached Tanzania, more discussion will be made later about this issue. Meanwhile it can be noted that the paradigm was criticized from its evolvement (Wittrock, 1966). Programs were so highly structured around disciplines of knowledge that they spoon-fed teachers and pupils, thus defeating their purpose of "discovering." They were based on top-down installing model of curriculum development and implementation, were teacher-and-student-proof, and embraced basic assumptions of behaviorism including stating all objectives in behavioral terms, and business metaphor of viewing teachers and pupils as mere consumers of finished specialist products rather than creators of knowledge and method (Aoki, 1983; Mbeo, 1975). The major contradiction seems to be that while the movement intended to promote thinking and active learning, it actually did the opposite. It tended to encourage passive and robotish learning of discovering the predetermined givens and treating everything involved in the discovery program as pure truth and unproblematic. This criticism is also relevant to most, if not all, of the current *thinking* programs (Costa, 1985; Klenz, 1987; Schrag, 1988).

Giroux (1979, p. 279) notes that many of the social studies curriculum projects that came out of the discipline-based curriculum movements of the sixties did more to impede critical inquiry than to promote it. Based on fundamentally flawed assumptions about theory, values, knowledge, and instructional techniques in social studies curricula design and implementation, these projects ignored the multiplicity of perspectives found in any one discipline. With the social nature of conflict and skepticism removed from these projects, ideas appear as inert and ahistorical, reified categories whose underlying ideology is only matched by the tunnel vision they produce.

Indeed, Bruner (1971) has called for a different approach that departs radically from that centered on academic rationalism and technicalist, positivist sham "discovery method," to one focusing on genuine inquiring into "needs now" - "doing things in which immediate and compelling concerns are given the central place" (p. 20). He suggests:

> Let them [students] ... prepare "briefs" in behalf of their views, make a case for things they care about. Let them prepare plans of action, whether they be on issues in the school, on the local scene or whatever. What is important is to learn to bring all one's resources to bear on something that matters to you now (p. 20)

He then declares (italics in original text):

> *a de-emphasis on matters that have to do with the structure of history, the structure of physics, the nature of mathematical consistency, and deal with it rather in the context of the problems that face us.* We might better concern ourselves with how those problems can be solved, not just by practical action, but by putting knowledge, wherever we find it and in whatever form we find it, to work in these massive tasks. *We might put vocation and intention back into the process of education, much more firmly than we had it there before (p. 21).*

PERSONALISTIC PARADIGM

Zeichner (1983) identifies *personalistic paradigm* to teacher education which employs a metaphor of "growth" (Kliebard, 1972). According to Zeichner, this paradigm's central focus is to promote the *psychological maturity* of prospective teachers and emphasize the reorganization of perceptions and beliefs over the mastery of specific behaviors, skills and content knowledge. It is thus opposed to behaviorism: the behaviors of teachers and their environments they create are assumed to result largely from the particular meanings and purpose of teachers; the specification of a particular set of behaviors for all teachers to master is viewed as an antithetical to the development of mature and complete teachers.

Teacher education is viewed as a form of adult development, a process of "becoming" rather than merely a process of educating someone how to teach. The paradigm responds to student teachers' own definitions of their learning needs and the student is viewed as an active agent in determining the substance and direction of his or her own professional education. Like behavioristic, academic rationalistic, and discovery-learning paradigm, however, the problem of teacher education and teaching is defined within an educational and social context that is largely accepted as given and unproblematic.

Concerns Based Model

One variation of personalistic paradigm is what is termed "concerns based model" (University of Alberta, 1989) or "personalized approach to teaching" (Zeichner and Teitelbaum, 1982) developed by Fuller (1969; 1971; 1972; Fuller and Bown, 1975) and her colleagues. It is a developmental approach consisting of three "stages" of teacher development that can be distinguished according to the nature of the *concerns* that are dominant at a particular point in time. These stages include : (1) *survival or self-oriented concerns;* (2) *teaching- situation or task concerns;* and (3) *pupil or impact concerns.*

During the first stage student teachers and teachers are primarily concerned with such things as their own adequacy as teachers: how they will be perceived and evaluated by their supervisors and class control. During the second stage of teacher development the concerns of teachers shift toward the mastery of the *teaching task* and their classroom situations (e. g., concerns about having to work with too many pupils. about the lack of materials, etc.). It is only during the third stage that teachers begin to be concerned with their impact on pupils (e.g., about the appropriateness of content for individual pupils). This is viewed as most *mature* stage of teacher development (Zeichner and Teitelbaum, 1982).

Zeichner and Teitelbaum (1982, p. 99) note that the essence of the "concerns based model" is that the content of teacher education program should be matched to the level of concerns (self, task, impact) being experienced by the student teachers. One weakness of this approach is that it confines solely preservice teacher education programs to survival-oriented concerns. According to the advocates of this approach, "only survival training

should be offered during pre-service education and that all of the sophisticated substance of professional education ought to be offered during in-service years" (Zeichner and Teitelbaum, 1982, p. 99). Thus, besides focusing only on survival human needs, the approach separates sharply preservice from inservice programs in terms of these concerns. Preservice teacher education programs would simply be designed to help students be more comfortable within a context that is taken for granted.

It is not inherently wrong to suggest that a teacher education program be developed around students' concerns, since any program not considering the needs of its students will not likely succeed. However, the elimination of non-survival-oriented content from preservice program is unrealistic and unwise. As Beyer and Zeichner (1987) state,

> It is important to remember that the "survival concerns" of prospective teachers are not genetic endowments but are in fact concerns that are rooted at least in part in the current educational contexts in which education students are expected to work. Just because teachers appear to develop in a particular way under present circumstances does not imply that this is the way we ought to help teachers develop ... To attempt to prescribe a curriculum for teacher education solely on the basis of the teacher concerns literature ... is to legitimate the institutional contexts within which teachers now develop (p. 318).

This approach is based on the assumptions of *maturation* and "waiting" that constitute the basis of Piagetian developmental psychology. Consequently, the approach assumes rigid *structuring* and sequencing of teaching and learning in predetermined, arbitrary stages. The approach views students within a particular stage as homogenous entities who have similar or the same needs and the same experiences they are bringing into the program. Indeed, the survival-oriented concerns approach is conservative and shares the assumptions of the positivistic paradigm of teacher education and teaching.

TRADITIONAL-CRAFT PARADIGM

This paradigm (Zeichner, 1983, p. 5) is based upon a conception of teaching as a craft and of teachers as craftspersons. Teacher education is viewed as a process of apprenticeship (Tom, 1980b). According to this paradigm, knowledge about teaching is accumulated largely by trial-and-error and is to be found in the "wisdom of experienced practitioners." It is further assumed that much of this accumulated knowledge is tacit rather than specified in behavioral terms, but it is presented in elaborate sequences of skills and routinely. A master-apprentice relationship is seen as the proper vehicle for *transmitting* the "cultural knowledge" possessed by good teachers to the novice.

Sergiovanni (1986) notes that whereas science and applied science value lawlike principles, the craft model values experience, practicality, and usefulness: "It is what works that counts, and one finds out what works in the world of practice, not in a research laboratory ... Craftspersons, like applied scientists, typically practice in standardized ways" (pp. 23-24). Sergiovanni finds this paradigm both limited and limiting. It is limited in that it deals only with a prescribed range of activities and a narrow experience with the background and context of the profession. It may lead the apprentice, for example, to see only the classroom or school and may mask the relationship of the school within the community and the role of school in society. It is limiting in that it does not widen the student's perspective to include theory or rationale of practice or the purposes of schooling.

Zeichner (1983, p. 5) notes that, as in the behaviorist paradigm, prospective teachers are viewed in the craft model primarily as passive recipients of knowledge and

have very little say in determining the substance and direction of their preparation programs. As in the case of the previous paradigms, the problem of teacher education and teaching is defined within an educational and social context that is largely accepted as given and thus unproblematic.

TEACHING ROLES

Another approach to understand the nature of teacher education and teaching and the programs involved is to identify the teaching roles. All other paradigms include and suggest such roles of various forms. Meighan (1986, 1988) identifies two broad categories of teaching roles: *authoritarian* and *non-authoritarian* roles. This approach focuses on the degree to which educators and learners share "power" and "authority" in terms of the degree of autonomy and democracy accorded to the students to determine the content, process and direction of instructional programs.

Authoritarian Teaching Roles

The basic assumption underlying authoritarian teaching roles is that *one person* is dominant and that others are dependent. The teacher or teacher educator decides; the learner or learners are required to respond. This is true of all aspects of the relationship: the control aspects of the situation are seen as the responsibility of the teacher, so is the selection and structuring of the program elements.

Although power and authority lies firmly in the hands of the teacher or teacher educator in authoritarian approaches, the form that this takes varies. One source of variation is where some delegation of decision-making is granted to the learners. The most restricted and least flexible form is the autocratic. Meighan (1988, pp. 27-29) identifies the following types of authoritarian teaching roles:

1. **Autocratic:** In this autocratic form, order is obtained through the use of fear. This fear may be physical, psychological or both. The images associated are those of a ringmaster, a commanding officer or a dictator. The style is openly coercive. Advocates of this approach speak enthusiastically about "firm discipline" and "punishment" for the learners who are perceived as resisters. The teaching and learning situation is typically threatening.

2. **Parental:** Order is obtained through deference in the parental form where the related images are those of persuasive mother, father, religious leader or elderperson. The description of "benign dictatorship" is sometimes applied. Learners are usually seen as "receptacles" or as "raw materials."

3. **Charismatic:** In this form, order is obtained through personal charm, public performance skills and good humored repartee. The images associated with this approach are those of a leader with disciples, an entertainer with fans or a pied piper with followers. Learners are perceived as audience or as followers. Secondary school teachers who can achieve this style enjoy high levels of popularity with their students.

4. **The Expert:** In this role, the stress is on the information possessed by the teacher or teacher educator which the learners are induced to believe is necessary, or useful or special. Related images are those of the sage, or doctor, scientist or medicineman and a more specific form of deference is invoked than in the parental form. The learners tend to be seen as passive receptacles.

5. **Organizational:** This form can be most deceptive. Order is obtained through detailed organization, indicating a clear structure, operated through precise instructions to ends and means planned in a systematic way. The images associated are those of an architect, a production planner or television script writer. Students may appear to be behaving independently, working on individual assignments it would seem and indeed some decisions may have been delegated to them, but in all key respects, the teacher or teacher educator has planned and continues to control the system. Learners are perceive as raw materials.

6. **Consultative:** In the consultative forms of order, feedback from the learners is used to establish and modify the learning programs. The role of student is more interactive in that the teacher has taken some account of the ideas and responses of the group members. The teacher, however, retains the veto throughout and remains in overall control. Learners tend to be seen more in the role of clients.

Non-Authoritarian Teaching Roles

Non-authoritarian teaching roles may be seen as falling into two groups, *autonomous* and *democratic*. In both cases there is a shift towards power sharing.

1. Autonomous Study and the Teacher's Role

This approach signifies that the teacher *negotiates* most if not all the features of the study program and that a learner has some degree of power and responsibility for the learning from the start. That power and responsibility can be increased over time. A variety of terms have been used to identify this approach, including *individualized learning, personalized instruction, independent learning,* and *self-directed learning*. The move is towards enabling the learner to become an autonomous explorer.

The role of a teacher is complex and requires the skills of providing advice, of facilitating the learning, of learning alongside the student, and of assisting with appropriate assessments. In providing for the accumulation of decision-making and study skills with the accompanying and gradual transfer of power, teachers are deliberately making themselves redundant for this particular learner. Autonomous learners gradually become competent enough to contribute some of their work to the collection for use by others. That is, they are productive rather than mere consumers of the products of others.

2. Democratic Learning and the Role of the Teacher

If autonomous teaching and learning is rare, democratic learning is even more rarer. In democratic learning the group of learners takes on substantial degree of decision-making and exercises inquiry in what is taught and learned. The group devises and implements its own program of studies to some extent or other. Meighan (1988, p. 30) identifies four forms of democratic learning: project approach, syndicate approach, learning cooperative, and independent learning cooperative; and power sharing and degree of decision-making increases as students move through to the last approach. It is thus in the rarest situation of independent learning cooperative, where the group is entirely democratic and takes all decisions including those of appropriate assessment.

There are several other ways of classifying teaching roles. For example, the "omnicapable model" (Gillis, 1981) of teachers' roles supports that teachers have numerous roles to attend to besides their central role of teaching. This model focuses on workload and time teachers devote to their profession. Meighan's emphasis, however, is directly on teaching and learning processes. What is not clear is whether or not the

democratic teaching role enables learners and educators to critically reflect upon and challenge educational and social context that is taken for granted. If democracy simply means mere *choice* of the content and process, such conception is indeed narrow and conservative as learners may choose from given, predetermined and unproblematic situation by routinely applying established lawlike rules and principles. It is one thing to have learners choose for themselves what is to learn and how to learn it from disciplined knowledge, and another thing to get them to reflect critically on that funded knowledge, research, and pedagogical methods and possibly change them and construct knowledge of their own making by questioning conformity to the status quo both in school and in society.

INQUIRY-ORIENTED PARADIGM

The meaning of *inquiry*, though a very common term in educational literature, is very obscure. It has been used to mean different things, some of which are antithetical to one another. All schools of thought reviewed in chapter two and paradigms reviewed in this chapter use the term in one way or another.

Tom (1985), Zeichner (1983) and Zeichner and Teitelbaum (1982) illustrate this problem by citing *teacher images* at the base of various exemplars of inquiry teacher education. These conceptualizations for the development of "habits of inquiry" include "creating self-monitoring teachers," "reflective teachers," "teachers as continuous experimenters," "adaptive teachers," "teachers as action researchers," "teachers as applied scientists," "teachers as moral craftsmen," "teachers as problem solvers," "teacher innovators," "teachers as hypotheses-makers," "teachers as clinical inquirers," "self-analytic teachers," "teachers as radical pedagogues," "teachers as political statesmen," "teachers as inquirers," "teachers as participant observers," and "scholar-teachers." To these we can add "teacher as social constructionist."

Tom (1985) gives examples of how an appeal to a particular image by two educators does not guarantee that they agree on the essence of inquiry-oriented teacher education or teaching. Other images convey clear philosophical and psychological positions. For instance, "teacher as applied scientist" suggests a behavioristic paradigm, while "teacher-scholar" implies academic rationalism; yet both of them are claimed to be inquiry-oriented. "Teacher as problem solver" would probably suggest the discovery paradigm and/or much of what is currently taking place under "thinking movement" in the cognitive field of educational psychology.

What follows is an attempt to identify some of the *key* characteristics or assumptions that may underlie genuine efforts to foster an inquiring mind in schools and teacher education institutions. They include social constructivism, broad and unitary view of an inquiring mind, moral and political commitment, collaboration, and methodology. Indeed, outlining these characteristics and assumptions is not an easy matter or a short term issue. Continuous inquiry into this question should itself be part and parcel of an inquiry-oriented program.

Social Constructivism

It was pointed out in chapter two that "social constructivism" is a currently accepted philosophical stream in education. Constructivism assumes that educational as well as other social, political, economic, and cultural phenomena are *social constructions* that have been created by human beings rather than being viewed "as natural as rock and trees" (Tom, 1985, p. 41).

Social constructivism embraces the notion of the *problematic* as a central element of inquiry (Tom, 1985):

> Significantly we speak of making a teaching situation problematic, a gerund that suggests a conscious attempt on the part of the teacher to suspend judgment about some aspect of the teaching situation and, instead, to consider alternatives to established practice. To make teaching problematic is to raise doubts about what, under ordinary circumstances, appears to be effective or wise practice. The object of our doubts might be accepted principles of good pedagogy, typical ways teachers respond to classroom management issues, customary beliefs about the relationship of schooling and society, or ordinary definitions of teacher authority - both in the classroom and in the broader school context ... the making of some aspect of teaching problematic is to question that which is taken for granted (p. 37).

With such an emphasis "technical skills" will not be seen as unimportant, as they will be part of the whole arena of the problematic. Zeichner (1983, p. 5) suggests that technical skill in teaching is to be highly valued, not as an end in itself but as means for bringing about desired ends. Moreover, technical skills may be both in an instructional program, means as well as ends. The danger is to confine the entire educational program solely to such skills, and to view *all* "skills" as technocratic and mechanical. As Bullough (1989, p. 15) notes, while many educational problems appear to be merely technical in nature (i.e., "how to" questions), when addressed through inquiry they no longer are just technical problems. Both technical and non-technical components of any instructional program have to be made problematic and subjected to inquiry.

To adopt a reconstructivist view of teaching and learning is, as Smyth (1992, pp. 299-300) puts it, to act on the world in a way that amounts to changing it. This action amounts to being able to see teaching realities not as immutable givens but as realities defined by others and as essentially contestable. If teachers are to experience their lives in authentic terms, then they will have to expel the internalized images that researchers, administrators, and policy makers are so deft at perpetuating. By constructing portrayals of their own teaching that are embedded in the particularities of that teaching, they are able to gain a measure of control through self-government, self-regulation, and self-responsibility that will enable them to trumpet the virtues of "what is best in teaching." This action denies the artificially constructed separation of thought from action, of theory from practice, of mental from manual labor, and ultimately to jettison the false and oppressive view that people outside of classrooms know what is "best" about teaching. Such a stance means that the people who do the work of teaching should have the right to reflect upon it. Indeed, this is a suggestion of *praxis* approach to teaching and learning.

To adopt a contructivist view is to abandon the sole dependency on funded or disciplined knowledge, a fund of basic knowledge which it is assumed all people must have and a notion which encourages unthoughtful acceptance of authority and dependency. Thus, the purpose of schooling will not merely be to have students *fit in* and simply reproduce the society as it is, but to use knowledge constructed by them to change the world in accordance with the principles of justice and humane society. To adopt "critical constructivism" is to reject empiricist-positivist-rationalist technical rationality - a rote, unimaginative approach to inquiry involving mere use of standardized techniques and *a priori* formulas to solve problems (Henderson, 1992).

Broad and Unitary View of Elements of An Inquiring Mind

It has been demonstrated in chapter two that there are various and contradicting views of what constitutes elements of an inquiring mind. It might be established tentatively, however, that each of the elements identified has a legitimate place in the development of an inquiring mind. Noted was the fact that these elements are highly interrelated in a complex manner. Figures 1 to 7 in chapter two show that, despite the attempts to isolate discrete "micro-processes" under each element, those processes and skills in various "macro-processes" overlap greatly. It is reasonable to suppose that these elements and their sub-categories (arbitrarily defined as they are) exist and work in an intricate unity. It is this unitary or integrated nature of thinking or inquiry elements that a program intended to develop an inquiring mind should seek to achieve and promote rather than focus on and engage in arbitrary identification of "atoms" and "nuclei" of these elements and treat each in isolation. Thus, problem posing, problem-solving, critical thinking, creative thinking, decision-making, metacognition, epistemic cognition, reflection, various kinds of attitudes and values or dispositions and actions - "mental-physical" - need to be viewed as integrated and helping one another in an act of inquiry.

The problem with current thinking has been to atomize these elements into endless lists of processes or skills or operations and to teach each as a discrete component unrelated to others (Costa, 1985; Klenz, 1987; Schrag, 1988). One weakness of commercial thinking programs and others based on atomist view of knowledge which is of course empiricist-positivist, is that they assume an objectivated pedagogy which is antithetical to constructivism. As Klenz (1987, p. 14) notes, knowledge can be considered static and transferable with little or no qualitative changes in the learner, *or* dynamic and actively constructed by the learner in the act of knowing. The latter constructivist view of learning sees thinking and feeling as integrated. This view supports that intentionality and meaningfulness to the learner are crucial for genuine understanding. Commercially developed thinking programs, however, reflect a stance of objective generalizability of unintegrated knowledge across areas of subject matter and contexts of learners and teachers. This type of curriculum development and implementation embraces assumptions that stifle rather than promote an inquiring mind. A more "balanced" program suited to the development of an inquiring mind needs to be broader in scope to include elements in a unitary and constructivist manner.

Moral and Political Commitment

Giroux (1979, p. 279) suggests that if a more critical view of knowledge would define it as a social construction linked to human intentionality, and be translated into a meaningful pedagogical principle, the concept of knowledge as a social construction will have to be linked to the notion of power. On one level this means that classroom knowledge can be used in the interest of either *emancipation* or *domination*. Such knowledge can be critically used and analyzed in order to break through mystifications and modes of false reasoning. Or, it can be used unreflectively to legitimize specific sociopolitical interests by appearing to be value free and beyond criticism. If the interface between knowledge, power, and ideology is to be understood, knowledge will have to be defined not only as a set of meanings generated by human actors but also as communicative act embedded in specific forms of social relationships.

Recognition that inquiry may be either emancipatory or oppressive makes inquiry a moral and ethical issue. Thus Zeichner (1983) suggests that an inquiry-oriented program needs to help teachers and students "assume a greater role in shaping the direction of educational environments according to purposes of which they are aware and which can be justified in moral and ethical as well as instrumental terms. Underlying this approach to

teacher education and teaching is a metaphor of *liberation*. A liberated person is one who is free from the unwarranted control of unjustified beliefs, unsupportable attitudes, and the paucity of abilities which can prevent that person from completely taking charge of his or her life (Siegel, 1980, p. 16)" (Zeichner, 1983, p. 5).

Zeichner and Tabachnick (1991, pp. 7-8) note that with social reconstructivism, schooling and teacher education are both seen as crucial elements in the movement toward a just and humane society. It has been evident that schools as social institutions help produce a society based on unjust class, race, and gender relations and that teachers have a moral obligation to reflect on and change their own practices and school structures when these perpetuate such situations.

In a social reconstructionist conception of inquiry-based teaching and learning, the teachers' attention is focused both *inwardly* at their own practice (and the collective practices of a group of colleagues) *and outwardly* at the social conditions in which these practices are situated. How teachers' actions maintain and/or disrupt the status quo in schools and society is of central concern. Thus, an inquiry-oriented program intended to develop an inquiring mind needs to embrace the concept of liberation or emancipation, and thus help to free individuals and society from oppression and injustices of all kinds. Indeed, this democratic and emancipatory, moral and ethical component is a central aspect of the policy of ESR: it aims at establishing social justice, integrity, equality, human dignity, rights and freedoms that are needed to make this world a humane community.

Collaboration

Collaboration has been viewed by several educators as a central component of inquiry that has roots in social constructivism and a pedagogy and educational research that promote this view of inquiry (Henderson, 1991; University of Alberta, 1989; Carson and Jacknicke, 1989; Mbeo, 1991; Zeichner and Tabachnick, 1991).

Zeichner and Tabachnick (1991) note that one of the distinguishing characteristics of a social reconstructionist conception of reflective teaching is its commitment to reflection [or inquiry] as a *communal* activity. Social reconstructionist oriented teacher educators seek to create "communities of learning" where teachers can support and sustain each other's growth. This commitment to *collaborative modes* of learning indicates a dual commitment by teacher educators to an ethic where justice and equity on the one hand, and care and compassion on the other, are valued. This commitment is also thought to be of strategic value in the transformation of unjust and inhuman institutional and social structures. Specifically it is felt that the empowerment of individual teachers as individuals is inadequate and that the potential for institutional and social change is greater, if teachers seek their individual situations as linked to those of their colleagues (Freedman, Jackson and Boles, 1986).

Beyer (University of Alberta, 1989, p. 30) makes a similar point when he proposes that we must collaboratively work with students, teachers and others, not only to reconsider current possibilities, but also to conceptualize alternative possibilities and how they may be morally and democratically accomplished. Indeed, Johnson (1981) has identified a list of the social skills associated with collaborative inquiry activities. They include *self disclosing, developing and maintaining trust, communicating with others, listening and responding, accepting yourself and others, resolving interpersonal conflicts, confronting and negotiating*, and *managing anger and stress*. Henderson (1992, p. 109) notes that with collaborative inquiry, members of the group respect each other's points of view because they are bound by an ethic of caring and because they all believe in the

enduring value of constructivist learning in which constructive criticism is accepted and encouraged.

One of the central purposes of collaborative inquiry is to avail student teachers, teachers, and teacher educators the opportunity to grow professionally. Several strategies and activities have been used to promote collegial professional development of educators. Some of these include action research (Kemmis and McTaggart, 1982; Carr and Kemmis, 1986; Carson, 1989; Carson and Couture, 1988); school-based curriculum development (Kemmis and McTaggart, 1982; Gillis, 1981; Haysom, 1985); participation of teachers in formative and summative evaluation (Hart and Ripley, 1989; Haysom, 1985; Bloom, 1980; Mbeo, 1991); and peer teaching or peer coaching (Joyce and Shawers, 1982; Henderson, 1992). Some activities, however, may be non-contructivist in nature and, therefore, there is a need to conduct a continuous inquiry on these activities and choose and design those which will best serve the goal of developing an inquiring mind.

The spirit of collaborative inquiry is in line with the goals of "cooperative endeavor," "collective leadership," and the principle of "people's participation" in human affairs which are the crux of Tanzania's political ideology. A program intending to develop an inquiring mind would be incomplete without taking into account collaborative inquiry at all levels of the educational system.

Methodology

The assumptions made above suggest a view of teaching methods which sees a learner as an active, creative, productive person who challenges ideas, questions thoughtfully, and contributes to the just, democratic and humane transformation of society. Given the dominance of empiricist, positivist, and rationalist methodologies of teaching and research, a deliberate shift from this position is needed, to one that views humans as democratic and autonomous beings of praxis. Social inquiry utilizing humanistic approaches such as phenomenology, hermeneutics, ethnography, and other forms of such inquiry need to be adopted. This is not to suggest that quantitative approaches have no place in educational endeavors, but the employment of social inquiry in education is one way to understand and even to undermine the supremacy of research and teaching paradigms of the natural sciences and their applicability and effects to social phenomena.

The adoption of the view of the arena of the problematic means that the schools and teacher education institutions should be the centers of inquiry in which teachers and students are themselves active inquirers, creating a culture of research. The focus on developing personal knowledge from experience in the school or teacher education settings is not intended to diminish the importance of research-validated knowledge. On the contrary, as Grimmett notes, "these findings become all the more important in that they enlarge student teachers' [and all other educators'] thoughts (as distinct from giving them simple rules of practice to follow) about what is possible in the reframing of their classroom teaching, particularly as they reflect on how teacher's behavior may or may not influence student learning (1988, p. 11)" (University of Alberta, 1989 p. 31). To avoid the danger of mere application of research findings, all kinds of processes and products of educational research *must* be made problematic by educators and learners themselves. So should all *means* and *ends* that are availed to the school and classroom. The top-down installing modes of curriculum development and instruction and of evaluation (Mbeo, 1975, 1991; Aoki, 1983; Lanier, 1982), which disempower, dehumanize, and depersonalize teachers and students, are antithetical to the development of an inquiring mind and need to be attacked and resisted.

A classroom in which the ethos of social contructivism is highly valued and forms the basis for teaching and learning - one emphasizing the development of an inquiring mind - would be characterized by valuing the notion of the arena of the problematic; free, open, thoughtful, and democratic dialogue and debate on various concerns and issues and dealing with multiple perspectives; recognition, encouragement and support for the contribution of new ideas; extensive use of knowledge created collaboratively and individually by students and teachers, and unfunded knowledge from the larger environment; questioning continuously, and planning for "inquiry action" by both teachers and students; wide and frequent participation of students in inquiring into classroom, school, and social affairs to solve genuine, real-world problems; and frequent use of collaborative inquiry which will help students learn to relate to each other and work together in groups and thus cultivate the culture of caring. "Meta-inquiry," that is inquiry on inquiry process itself, should be a central activity of an inquiring classroom. So should all methods of teaching; for, there is a tendency for some educators to question certain "recipes" of teaching while in fact they push new recipes as if those methods were flawless.

Problems

The nature of the *problem* to be inquired into or a *question* to ask and settle is crucial to the types of inquiry to be undertaken and instructional activities to be done in the teaching and learning action. "Problems" or "questions" have been defined and classified in various ways (Costa, 1985; Ainley, 1988; Pimm, 1988; Schrag, 1988; Weizenbaum, 1981; Henderson, 1992). Various studies have also been conducted on teacher questions in the classroom and how this is related to metacommunication and control in the classroom (Pimm, 1988; Hargie, 1978; Stubs, 19761; 1974). Questioning is also seen as "the lifeblood of learning, teaching, and learning about teaching" (University of Alberta, 1989 p. 26).

Paul, Binker, Martin and Adamson (1989 pp. 21-46) propose that *Socratic questioning* is not only a method of teaching but also one of the critical thinking strategies, and they illustrate how to foster it in a Socratic-like teacher-student talk in different transcripts. Pimm (1988) gives an example of such questioning by Socrates from Plato's *Meno*:

Socrates: Tell me boy, do you know that a figure like this is a square?

Boy : I do

Socrates: And you know that a square figure has these four lines

equal?

Boy : Certainly.

Socrates: And these lines which I have drawn through the middle

of the square are also equal?

Boy : Yes.

It continues in this manner for a number of pages.

For Hyde and Bizar (1989) "a problem is a question or task that has neither a simple answer nor an obvious way to solve it. It should be a task or question that perplexes and intrigues, creating a desire to explore or attack" (p.42).

I also referred to a distinction made by Schrag (1988) between *well-structured* and *ill-structured* problems, and by Weizenbaum (1981) between *bounded* and *unbounded* problems. According to Schrag, a problem is well-structured if there is a definite criterion for testing any proposed solution and a mechanizable process for applying the criterion. For a problem to be well-structured, it must come with a clearly defined goal, allowable moves, and givens. Once one has satisfied the criterion through a series of allowable moves, as is the case with puzzles and games such as chess, his or her work is at an end. Schrag finds that this definition of a problem derives from work in artificial intelligence and cognitive psychology. For an ill-structured problem, on the other hand, a good part of the work of solving the problem derives from the need first to formulate it. Thus Dewey (1938) says,

> It is a familiar and significant saying that a problem well put is half-solved. To find out *what* the problem and problems are which a problematic situation presents to be inquired into, is to be well along in inquiry (p. 108).

An ill-structured problem is itself problematic.

According to Weizenbaum (1981) who makes a similar distinction notes that a bounded problem is relatively clear and its solution is readily apparent to teachers with different beliefs and habits. The problem is fairly straightforward, or bounded. An unbounded problem is far more complex because it can legitimately be defined in many different ways. Or, information about the problem may be incomplete and the solution for solving the problem may not be readily apparent or may not yet exist (Henderson, 1992, pp. 50-51).This distinction is significant to the development of an inquiring mind especially when we find that much of the teaching under current thinking movement and most of the textbooks used in schools consist of well-structured or bounded problems (Schrag, 1988). This is typical, for example, of thinking exercises formulated by Sternberg (1980; 1983; 1985b), Perkins (1985), deBono (1970; 1973), Feuerstein et al. (1980) and many others in the various thinking programs. Most of what is called Socratic Method or Socratic Questioning consists of well-structured or bounded problems.

The problem with well-structured or bounded problems is that they tend to encourage the use of behavioristic paradigm based on Skinner's operant conditioning. In such a situation, students *wait* to be asked while passively listening to teacher talk. Thus, most of the student talk in the classroom is in response to a teacher-initiated question, and the response is then evaluated. There is a definite pattern, based on the framework or sequence: Initiation (I)-Response (R)- Feedback (F) (Pimm, 1987; Edwards and Mercer, 1987). Most or all student responses become "elicited contributions" that fall into this IRF model, where learners' contributions are directly constrained by the teachers' questions.

Phillip (1987) describes such questioning as "closed" style of questioning which allows the teacher to maintain control of the classroom discourse. The learner gives a very short answer, usually one or two words, thus being rendered speechless. The teacher accepts the response which constitutes his or her predetermined answers and the rest are seen as incorrect or irrelevant. With such a teaching style, teachers become slaves of their own plans and schemes.

Pimm (1987) finds the IRF model involving tyranny. "Tyranny, because it locks teacher into 'center stage,' acting as controller of the communication, as well as heavily

influencing the *types* and range of spoken pupil contributions in class" (56). With IRF framework, the teacher dominates the teaching and learning situation (probably unconsciously) through directive and nonverbally restrictive behaviors. Research on questioning related to "wait-time," "on-task behavior," and "off-task behavior" (Rowe, 1974; Kounin, 1975) in the field of "effective teaching behavior" or "direct instruction" of thinking skills (Costa, 1985; Cruickshank,1991; Derry and Murphy, 1986; Gagne, 1985; Gage and Berliner, 1984; Pauker, 1987) seems to relate to the IRF model. A program that emphasizes the development of an inquiring mind needs to maximize the use of ill-structured or unbounded problems and a pedagogy that encourages thoughtful dialogue and creative and critical reflection rather than the domination of well-structured or bounded problems which tend to put a closure to thinking and exploration.

SUMMARY

This chapter has explored the problem of developing an inquiring mind. Eight paradigms of teacher education and teaching were identified and reviewed with the intent of ascertaining the extent to which each of them was appropriate to the development of an inquiring mind. The suggestion has been made that it is the inquiry-oriented paradigm rooted in constructivism that is likely to ensure successful fostering of an inquiring mind in schools and teacher education institutions. A number of key characteristics and assumptions that may underlie genuine efforts to foster an inquiring mind have been proposed.

CHAPTER FOUR

METHODOLOGY

INTRODUCTION

This chapter looks at the research methodology that was used to collect and analyze the data. The sections that are discussed include the research design; the participants who were interviewed; data collection procedures which include interviews, classroom observations, documentary reviews, and personal observations and experience. Other sections discussed include data analysis; ethical concerns; and visits to research sites.

RESEARCH DESIGN

The purpose of the study and basic research questions that guided the study suggested the employment of a research methodology which would permit the researcher to investigate the phenomena and meanings involved in the study through an exploratory research design. Such an approach would not only allow the researcher to uncover and understand meaningfully the complex interrelationships among phenomena, concepts, and various interpretations; but, would also permit both the researcher and the participants to interact directly and conduct an investigative dialogue among themselves to reveal the reasons and meanings held by them on the aspects under study.

To establish such a research situation, the study used interviews as the primary method of collecting data. Interviews were considered to be most suited for allowing high rate of response, dialogue, requestioning, and reframing of questions according to emergent circumstances and flexibility in such exploratory research (Kidder, 1981; Kemmis and McTaggart, 1982).

To ensure that the data collected would be more valid and reliable, further data was obtained from the analysis of documents, classroom observations, and other informal observations and personal experience. These four methods of data collection were used in order to provide for *triangulation*, the use of diverse sources and forms of data which support or contradict one another (Miles and Huberman, 1984; Webb, 1965).

Another method that was used for further verification of data was to have participants react to my interview questions, their own responses, classroom observations, my tentative list of points drawn from interviews, and observations and some key documents. To ensure that key participants - teachers and pupils - were provided opportunity to participate in such verification, most were visited more than once. This process was maximized in Dar-es-Salaam where proximity allowed frequent interaction between the researcher and participants from this city, that is, from selected secondary schools, Dar-es-Salaam Teachers College (TC), Ministry of Education and Culture's headquarters, University of Dar-es-Salaam's Faculty of Education, National Examinations Council, and Institute of Curriculum Development.

PARTICIPANTS

The participants in this study came from various educational institutions which were as follows:

1. Thirteen teachers from seven secondary schools. Two teachers were selected from each school, but one diploma teacher dropped out of the study because he was going

on leave. He was not replaced because the number of diploma teachers participating in the study was already sufficient. Due to shortage of geography graduate teachers, only three of them participated in the study. Interviews were conducted with teachers who were teaching Forms 1-4, although in some schools some of them also taught in higher Forms. I had originally proposed not to include beginning teachers. However, I decided to include them because in some schools geography was being taught only by such teachers. Besides, I found out that novices also had their concerns related to the development of an inquiring mind.

2. **Fourteen pupils**, two from each school. Only pupils in Forms 3 and 4 were interviewed, seven from each Form level.

3. **Four heads of secondary schools** from among the selected seven secondary schools; two were headmasters and the other two headmistresses.

4. **Two evaluators** from the National Examinations Council of Tanzania (NECTA).

5. **Two curriculum developers** from the Institute of Curriculum Development (ICD).

6. **Six education officials** from the headquarters of the Ministry of Education and Culture (MOEC). They were selected from the departments which were regarded as significant to the study, including the Departments of Secondary Education, Teacher Education, Planning, Inspectorate, and the office of the Commissioner for Education who is responsible for academic and professional matters. All of these officials had some teaching experience either in schools and/or teacher education institutions. One of them had worked as a lecturer of education at the University of Dar-es-Salaam and author of a book on curriculum and instruction.

7. **One professor** from the Faculty of Education; he was one of the most senior professors in the faculty.

8. **Seven tutors** from Dar-es-Salaam Teachers College (TC); two of them participated in in-depth interviews, one from the Geography Department and the other from the Education Department. All seven tutors participated in departmental group interviews which were conducted before the in-depth ones. Of these tutors, four were graduates and three diploma holders. The two tutors who participated in the in-depth interviews were graduates from the University of Dar-es-Salaam.

The selection of the seven schools was done with the help of the program officer from the Department of Secondary Education at the MOEC headquarters. This official also provided a list of schools in which geography was being taught as a principal subject. Accessibility of schools was another criterion used to select the schools. Thus, all the selected schools were located in Dar-es-Salaam city, along the central railway line and Bukoba town. They included Azania, Bukoba, Dodoma, Forodhani, Kilakala, Morogoro, and Tambaza secondary school. Trial interviews with teachers and pupils were conducted at Zanaki secondary school.

At school level, the contact began with the head of each school who then introduced me to the head of the geography department. This head in turn arranged for a meeting with all teachers who taught geography. During that departmental meeting I was introduced to the teachers and I briefed them on the study and made a request for volunteer participants. After such meetings I approached individual teachers who expressed their willingness to

become participants and selected those who showed most enthusiasm. Virtually all teachers, heads of schools, and heads of geography departments supported the study and there was no problem to get the participants. In fact, in all cases there were more volunteers than I needed. This same procedure was used to gain entry and select tutor participants at Dar-es-Salaam Teachers College.

The sampling of pupil participants included the participant teachers in collaboration with heads of geography department who helped me select them. The criteria I asked teachers to use in selecting pupils included one pupil from Form 3 and another from Form 4, an ability to communicate in English and/or Kiswahili, and more important, pupil's willingness to participate. Before pupils were selected from those Forms, I spoke to the class for not less than fifteen minutes to introduce myself and talk about the study. I also felt that it was appropriate to have teachers select pupils for me so as to maintain good rapport and trust between me and the school community and administration.

Heads of schools were requested to be interviewed during my first meeting with them; and, they all accepted. During this meeting, I presented to each of them a copy of the research clearance letter from the Coordinating Unit for Research and Evaluation (CURE) allowing me to conduct research in the schools (Appendix E).

I approached all other interviewees personally and made a verbal request for their participation. Snowball sampling was used to identify these key individuals. That is, the first person interviewed was asked to recommend others; so were the subsequent interviewees (Bogdan and Biklen, 1982, p. 66). Unlike teachers, pupils, and tutors, but like heads of schools, these participants were interviewed only once.

DATA COLLECTION

Interviews

As indicated earlier, the major method of collecting data consisted of semistructured interviews. The degree of structure of the questions depended on the interviewee. For example, while officials and teacher educators responded at length to more open-ended questions, teachers and pupils tended to prefer responding to short, specific questions and gave short answers, sometimes consisting a word or two. This necessitated probing on the part of the researcher.

Three interview guides (Appendices A-C) consisting of loose questions were used to provide a degree of direction to the interviews (Spradley, 1979; Gordon, 1980; Smith, 1981; Hook, 1981; Rist, 1982). Guide A was used for in-depth interviews with teachers and two tutors, guide B was used to interview pupils, and guide C was used to interview the rest of the participants. Questions were formulated using the key ideas embedded in the basic research questions. To solicit for more ideas and have participant input into these interview guides all participants except pupils were asked to respond to the following question towards the end of the interview: *Now that you know my project, do you have any questions that you may wish to suggest for this study?*

Besides this question, which also involved the participants in validating some of the questions, trial interviews were conducted for the three guides with two diploma and two graduate teachers, three secondary schools pupils and one official. Thus validation of interview questions was done before and during interviews. Some of the suggestions made by participants and those from trial interviews were as follows:

(a) Use more indirect probing questions, especially with respect to emotional and sensitive issues such as those relating to school and MOEC's leadership, honesty, justice, absenteeism, and such other matters. This suggestion also applied to questions which solicited directly the individual's understanding of certain concepts. For instance, the question, "*What is your own view or understanding of the concept of an inquiring mind?*" seemed to embarrass some participants right from the beginning of the interview trials. The question was thus reframed differently for various interviewees, as were several other questions. For this question, for example, some participants were asked: "*If you were requested to talk about the goal of developing an inquiring mind to a group of student teachers who want to know its meaning what would come to your mind?*"

(b) Define and/or simplify certain terminologies used in the interview schedules to participants. Among such terms were "culture," "ethos," "curriculum orientation," "discipline" (academic subject), and "teachers' frame of reference."

(c) Focus on the factors that were likely to promote an inquiring mind in the future rather than on those which were currently promoting it at the time of field research. The question was changed according to the participants' suggestion because it was difficult for them to think of any factors that were "promoting" an inquiring mind. So, instead of asking the question "*What factors have tended to promote the realization of this goal?*" participants other than pupils were requested to respond to the question "*What factors or conditions do you think will help promote the development of an inquiring mind?*" Thus, the focus was placed, to use a terminology suggested by a participant, on the "growth poles."

(d) Ask teachers to make a comparison of the current teaching situation with the one that existed when they were themselves secondary school pupils. "This way you may ascertain the extent of the existing gap between the present and the past teaching situation," a headmaster suggested.

(e) Make a detailed review of the concept of "an inquiring mind" and find out what it means. This was the major concern for most participants including a professor interviewee and a former lecturer of education. One official found "elaborating this concept ... a big challenge." An inspector of schools found that "the problem of not knowing what inquiry is or what an inquiring mind constitutes is a very crucial one." He then urged the researcher: "Try to investigate this concept very closely. We need to know what it is, and I suppose if you would try to find out what teachers perceive of this concept you may find that this is a big problem we need to solve if we have to do anything sensible about it." "Actually if you asked educators the question: 'Would you just write me the specific skills which are related with inquiring mind,' you will see the type of behavior or the reactions from those educators. Really, just try in schools. You will see what I really mean," a former curriculum developer suggested.

(f) Include the pupils in the study. "Look at the output ... the students who have gone through whatever program. Interview them. Do they feel really they have that skill? Take those students who are still in the system ... Forms 3 and 4 ...," an official suggested.

(g) Find out the reasons why the political leadership which indeed initiated the goal of developing an inquiring mind was not taking it seriously and supporting its fostering explicitly as a priority issue in education. "Why do politicians not talk about the development of an inquiring mind in their constituencies, cabinet meetings or in the National Assembly? Why is the goal not in their minds? Find this out," a teacher urged.

All interviews were conducted by me, and some were tape-recorded. For others, only notes were taken because most teachers in secondary schools did not want to be tape-recorded. To maintain good relations with the schools, pupil interviews were also not tape-recorded. Unlike teachers and school heads, almost all the officials had no objection to tape-recording of their interviews. I also took notes during group interviews.

Classroom Observations

Each of the thirteen teachers was observed teaching at least once prior to being interviewed. All teachers were observed twice, making a total of 26 observations. Each lesson (period) observed lasted for 40 minutes (single period). A request to each teacher to be observed was made along with that for being interviewed during the first meeting at school after the teacher had volunteered to become a participant.

The observations were intended to familiarize the researcher with the interactions and activities that took place in social science lessons in a current secondary school teaching situation. This experience provided a frame of reference from which the teachers' views were contextualized. In addition, the classroom observations enabled the researcher to stimulate the teachers' reflection on observations and other issues during the interviews. This is why teachers were observed teaching at least once before being interviewed. To maintain good relations and understanding, teachers were told before observations that this was neither a formative nor a summative evaluation but a research procedure to obtain data for this study, and that anonymity would be guaranteed. For each observation made, the researcher was invited by the participant teacher to the classroom when he or she was ready to be observed.

In each observation an attempt was made to record the objectives of the lesson, teacher's and pupils' activities, the time each activity or sub-activity took, the instructional materials used, general physical appearance of the classroom such as seating arrangement, availability or absence of displays on the classroom walls, state of furniture and the situation of instructional materials used, class size, and other aspects which constituted the physical state of the classroom. All classroom observations were recorded by taking notes. Tape-recording of lessons was not possible because of absence of suitable equipment, and the fact that this method of data collection was not accepted by most teachers. Due to problems of recording time during the first few observations, four observations were excluded from the in-depth analysis of classroom activities.

Documentary Reviews

Several relevant documents were collected and reviewed as corroborative data. Documents used in this study are cited in the text, and most of them are included in the bibliography. Four Tanzanian newspapers were used as sources of data. They include Daily News, Sunday News, Family Mirror, and Uhuru. These newspapers are not included in the bibliography.

DATA ANALYSIS

The analysis of data was performed qualitatively (Bogdan and Biklen, 1982; Rist, 1982; Smith, 1981; Smith, 1982; Spradley, 1980), and manually by the researcher. In order to cater for a cyclical research procedure which provided for the emerging of new questions, reframing and reposing of other questions, and collecting more data, the analysis of data began during the process of data gathering. Indeed, data analysis and interpretation were continuous processes.

The analysis was done in two main stages. In the first stage, the data from each of the three main sources was translated and categorized into themes and sub-themes. Envelopes were used to categorize the data into respective themes and sub-themes. One envelop was used for each category of a theme or sub-theme. A category was recorded on a separate sheet of paper with an identification code. For instance, "Evaluation: Tambaza, T1" meant that "evaluation" was a theme category and the response relating to it was provided by teacher one from Tambaza secondary school. With this simple coding system it was easy to arrange and rearrange the data in various groups and sub-groups or to locate a certain category or a piece of information. Coding of data was also used in the analysis of classroom observations. An attempt was then made to make some interpretive statements under one or several categories of themes and sub-themes. Most interpretive statements and some findings which were identified during data collection were partly verified by the participants, particularly those from interviews and classroom observations. This verification led to further refinement of the interpretive summaries and themes.

The second stage of data analysis involved a synthesis of themes and interpretations. This process was accomplished by abstracting meanings from the themes and interpretations and focusing these meanings on the research questions and consequent chapters. The major processes the researcher went through at this stage constituted the real crux of an inquiring mind and seemed to include, among others, the following (Hoffer, 1983; Smith, 1982; Spradley, 1980; Beyer, 1971):

1. Identifying common themes, contradictions, equivalencies, meanings, and implications from the key themes and interpretive statements sought from interviews, observations and documents.

2. Identifying patterns, trends, sequences, and regularities related to the research questions.

3. Comparing and contrasting the general interpretive statements related to various issues and problems of developing an inquiring mind.

4. Seeking data from the data record that illustrate or substantiate the findings.

Figure 8 illustrates the processes which were involved in both stages of data analysis.

For each stage, categories of themes and subthemes and various interpretations were emerging and validating one another, supporting and strengthening each other, contradicting and eliminating one another, overlapping and merging into new categories, and creating other new categories. Consequently, some data would be shuttled from envelop to envelop and reorganized until appropriate categorizations and interpretations were made. This process led to further refinements of categories of themes and subthemes, interpretations and findings.

ETHICAL CONCERNS

Throughout the study ethical concerns were considered and taken care of. For example, all participants were requested to participate voluntarily in the study. All participants were guaranteed anonymity and their responses treated with confidentiality. Anonymity was also given to the participants who were ready to be identified openly in the study. It was also ensured that potential ethical issues and problems were anticipated by both researcher and participants before the interviews began. The participants were told from the beginning that they were free to withdraw from the project any time they wished to do so. Indeed, as noted earlier, one diploma teacher withdrew. Furthermore, official cooperation and formal approval to conduct the study was sought. Letter Ref. No.

ED/A3/10/RP/VOL.II/164 dated 16/08/90 (Appendix E) is a copy of the research clearance which was granted to the researcher by the Coordinating Unit for Research and Evaluation (CURE).

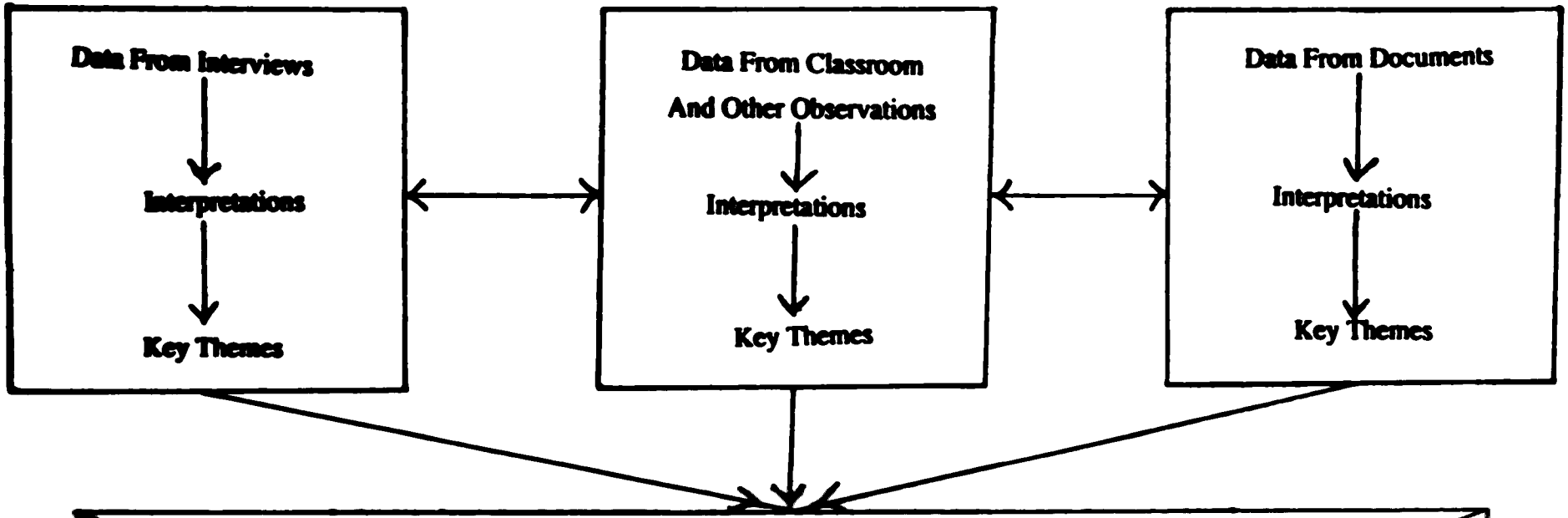
VISITS

The visits to various schools and other institutions are shown in the time-line (Appendix D). Field research took about eleven months. The visits were planned so that the researcher got the opportunity to gather more data for filling the gaps that would emerge from the research situation. This arrangement was also intended to enable the participants to verify the researcher's preliminary interpretations and findings more than once.

SUMMARY

This chapter has presented the research methodology which was used to collect and analyze the data. The sections that have been looked at include the research design, the participants, methods of data collection and validation, the process of data analysis, ethical concerns and visits made to secondary schools and other research sites.

Figure 8: A Flowchart Model Showing The Processes And The Stages Of Data Analysis



Abstracting And Focusing Meanings From Key Themes To Research Questions

(1) Identifying common themes, contradictions, equivalences, meanings and implications from the key themes in the interviews, observations and documents.

(2) Identifying patterns, trends, sequences and regularities related to the research questions.

(3) Comparing and contrasting the interpretive statements related to various issues and problems of developing an inquiring mind.

(4) Seeking data from the data record that illustrate or substantiate the findings.

CHAPTER FIVE

DEVELOPMENT OF AN INQUIRING MIND: THE CLASSROOM SITUATION

INTRODUCTION

Chapter two on the nature of an inquiring mind and chapter three on how it might be developed help to establish some criteria which may be used to make an assessment of the extent to which the goal to develop an inquiring mind has been met in Tanzanian secondary school classroom. This chapter attempts to address the following general question: *To what extent has the goal of developing an inquiring mind been adopted as a foundational touchstone in teaching and learning in Tanzanian secondary schools?* An exploration of the extant teaching situation at the time of field research is made. Although different subjects are cited to illustrate certain issues, geography is the major subject used in this assessment and indeed throughout this study. The chapter first gives a general assessment of the teaching situation, and then presents a description of the instructional activities which were observed in the classroom setting. The chapter also looks at teachers' use of lesson plans and "teachers as pupils."

THE TEACHING SITUATION

To find out the extent to which this goal had been reached, all participants except pupils were asked to respond to the following question: *How do you assess the teaching situation in secondary schools in relation to the goal of developing an inquiring mind?* For teachers and heads of secondary schools this question focused on the situation in their schools, but they were also free to relate their experiences elsewhere. The teachers' interview guide dealt with this question in more specific subquestions. To capture pupils' views on this issue, they were asked to respond to the question: *How do you assess the way you are taught geography?* As their interview guide indicates this question was also broken down into several specific questions.

The general finding from the responses of all the interviewees was that the *inquiry goal* had basically *not* been met in Tanzanian secondary schools. Despite this general observation, that the development of an inquiring mind had remained mainly unattained, different interviewees held various views on the extent to which the goal had or had not been achieved. Most participants found that there was no change at all towards meeting the inquiry goal. All practitioners (teachers and teacher educators) and the majority of administrators (all four heads of schools, all two curriculum developers, one of the two examiners, and three of the six officials from MOEC headquarters) believed that the teaching situation was as traditional as it was in 1967, and a few of them held the opinion that in fact there was a degree of pedagogical retrogression rather than stagnation. These latter participants found the teaching situation to have become worse than that which existed in 1967 when ESR was promulgated. "I don't think we are really heading towards an inquiring mind," an administrator and former curriculum developer at the ICD and education lecturer commented.

A key administrator in the Department of Secondary Education who was an academic coordinator of all the subjects taught in secondary schools was of the following opinion:

> We haven't achieved this goal, though we are insisting that teachers do teach using the approaches that develop an inquiring mind. Unfortunately, instead they lecture rather than involve students to inquire or have students use their minds freely. As such we are a bit behind expectation of the set goal. Students still regurgitate the

> information given to them by teachers through lecturing and notes. So in essence we haven't quite achieved it.

A few participants believed that schools had made some progress in promoting the goal of developing an inquiring mind but that this progress was limited to some subjects. These included two administrators from MOEC headquarters who found that the inquiry goal had been met "to a small extent at least in certain subjects." While for one administrator the small achievement in the development of an inquiring mind was "mainly limited to natural science subjects and perhaps a little more in geography," the other administrator believed that "political education is the only example where I could see the inquiring mind going on." This latter administrator, a former lecturer and author of a book on curriculum development and instruction, found that "in other natural and social science subjects including geography there is hardly any existence of the teaching and learning climate that encourages the development of an inquiring mind." A secondary school inspector of schools from MOEC headquarters who also associated the absence or presence of the development of an inquiring mind with school academic subjects believed that lecturing was more dominant in the teaching of social sciences than natural sciences because of the assumption held by teachers and pupils that in the former subjects there were no practicals or experiments or a pressing need for field work. "In fact that is why weak students think they will do better in art subjects because they think they will do nothing else but read and memorize facts," he commented. He, however, observed that the role of the pupils in the classroom was "to receive whatever is given to them. While students are *receivers*, teachers are supposed *owners* of knowledge and are there to *give* it."

Two other administrators, an official from the MOEC headquarters and an examiner from NECTA, maintained that despite the shortcomings yet to be overcome, the fostering of an inquiring mind was "progressing well in secondary schools." The examiner described the achievement as "to a great extent" and found that "there are several indicators in many sectors of our economy which manifest the great achievement of this goal," and one of them was that "self-confidence among the youth is abundant." The assessment of the other administrator, a former chief inspector of schools, was rather adamant: "I don't think that it is a fair assessment to say that we haven't achieved much in our schools. Much is done in helping students to develop an inquiring mind. And we can see this in the field, the way our students do their work, especially in natural science subjects, particularly through projects and related activities. Teachers are applying inquiry-oriented methods from time to time, although not all of them." He was the only administrator out of the six from the MOEC headquarters to maintain this position, though he at the same time accepted that the majority of teachers were using lecture method. Such ambivalence expressed by this participant was also demonstrated by some of the top officials in relation to other issues, a factor that may have been due to their desire to maintain the status quo.

However, the general picture given by the above participants was that the goal to foster an inquiring mind in Tanzania's secondary schools was far from being reached. All of them expressed the concern for the dominance of lecture method and giving notes to pupils. "Copy-copy," "talk-and-chalk," "pumping," "spoon-feeding," "preaching," "banking," "teacher's role as "information giver" or "provider of knowledge," and pupils as "receivers," "empty jars," or "tabula rasa" were among the expressions used by the participants to describe what they believed went on in the classroom. One official who had made numerous classroom observations as a teacher educator in the Faculty of Education had this to say regarding the instructional climate:

> Watch a teacher teaching in a class. You can actually find a teacher who uses forty minutes [the whole period] to do the talking and demonstrating, when the children are just listening. The pupils are sitting there passively listening and he [teacher] sometimes allows only about ten minutes at the end to ask one or two questions or to make them do some writing. Teaching in this sense only means preaching and this really kills the ability for students to develop their own inquiring minds.

The following section focuses on the evidence from what actually took place in classrooms.

INSTRUCTIONAL ACTIVITIES IN CLASSROOM SETTINGS

Lesson Activities

A gist of what transpired in geography and other classrooms may be ascertained from the following four responses made by pupils in Forms 3 and 4 from different secondary schools ("S" stands for "Student"):

> S1: Usually a teacher gives a lecture on a topic or a number of topics. As he teaches he writes major points on the chalkboard. He requires us to listen first and write the main points later. The teacher gives notes on the topic taught. Sometimes he gives the notes and teaches them later, but not in detail as the notes are. He sometimes asks questions towards the end of the lesson to check if we remember or have understood what he has taught us. He rarely gives us exercises or homework. (Form 4 student).

> S2: The teachers talk as we listen, giving explanations on different points, and at the end they ask questions as a review of what has been taught. They sometimes give assignments and sometimes they don't. Some teachers give notes on what they have taught but others give notes on topics which they haven't taught, and at times they do not teach what we have copied. They simply give us notes ... they don't care whether we understand or not or what we have copied is correct or not. (Form 3 student).

> S3: This geography teacher tells us what we are going to learn and sometimes why we have to learn it. She uses different methods of teaching, sometimes lecturing, sometimes group work, and sometimes she gives notes with gaps to fill in and she later gives answers and we mark our own work. In most cases she provides us notes. She allows students to ask questions at the end of the lesson. She hasn't given us any assignment this term. (Form 3 student).

> S4: Teachers are lecturing and giving notes. Some teachers send notes to the classroom and one of us writes them on the chalkboard for us to copy. Some teachers are ensuring that we understand what they teach, but others are busy with other things and rarely come to teach. I have to attend tuition lest I fail the national examination. (Form 4 student).

From these four responses it can be noted that teacher talk or lecturing while pupils listened, giving notes to them, blind copying of untaught notes, and questioning at the end of the lesson to review what had been taught were the dominant methods of teaching used. Rarely teachers used other methods such as group work, provision of assignments, students' self-evaluation and informing students the purpose of the lesson. The tone of pupils was an unhappy one, expressing dissatisfaction about how they were

taught, teacher absenteeism and worry about their success in national examinations which determined their future careers.

What follows is a more detailed description of classroom activities as noted during classroom observations and as reported by teachers and pupils during interviews. The activities are discussed according to the elements usually included in a lesson plan. During interviews teachers said that they were required to write lesson plans for every lesson they had to teach and that these plans had to be written according to the format prescribed by the MOEC, and fidelity had to be followed up by school inspectors and heads of schools. The elements discussed in this section evolved from classroom observations and interviews with teachers and pupils. Making them the framework of this discussion will help reveal the extent to which teachers used them in their day to day teaching. They include *statement of the lesson, introduction of the lesson, the body of the lesson, the conclusion of the lesson, assignments, notes, and questioning.* The time cited is based on a forty minutes lesson.

Statement of the Lesson Objectives

It was not a common practice of teachers to state the objective or purpose of the lesson to the class so that pupils knew exactly what was going to be taught or learned. Of the twenty-six lessons observed, teachers made a statement of the lesson objectives in only nine lessons, and these were only five out of thirteen teachers. The most common statement made by teachers was: "Today/During this period we are/I am going to ...." During interviews teachers mentioned that they were expected to state the objectives in *behavioral* terms, but none of them stated the objectives this way. In fact almost all diploma teachers said they did not know how to state behavioral objectives; three out of ten said they knew how to state them. All graduate teachers said they knew how to state them. But neither the graduate nor diploma teachers used them in their actual teaching. It is indeed a blessing in disguise that the behavioral school of thought in this regard has had a very minimal or no effect on the teaching practice of Tanzanian teachers.

Introduction of the Lesson

An introduction of the lesson was done in two ways. One way consisted of the teacher asking pupils review questions so that they revised briefly the content taught in the previous lesson. One common question teachers asked was: "What did we discuss/cover during the last period?" Other teachers asked questions that required pupils to remember and produce specific content taught, for example: "What are the three types of deltas we covered during the last period?" Another way teachers introduced their lessons was to make a short verbal summary of what they had taught, which included a statement such as: "During the last period we discussed/I taught you volcanicity. We saw that ...."

Basically both ways used to introduce the lesson consisted of reviewing the previous lessons either by questioning or summarizing the content covered. Of the twenty-six lessons observed twelve were introduced by review questions and ten by summary review. Four lessons started with lecturing the subject matter in the body of the lesson. The introduction, like the statement of the objectives of the lesson, was a very short activity, lasting for not more than two minutes. Pupils were involved in neither of these activities except answering a teacher's question. However, unlike the statement of the objectives, almost all teachers introduced their lessons, though in a limited way; only through review activity and only by teachers.

The Body of the Lesson

The main body of the lesson plan consisted of covering the "lesson notes," that is the actual content matter that the teacher taught in a particular lesson. The actual teaching took one of the following forms:

(a) Use of lectures only in which the teacher made a talk-and-chalk monologue to describe or explain and demonstrate the information from the lesson notes. This kind of lecturing was the most common way of teaching in the classrooms observed. Seventeen of the twenty-six observations consisted of such teaching in which teachers were in absolute control of the treatment of the subject matter. The teachers were lecturing, performing, demonstrating, or exhibiting materials while pupils listened.

(b) Use of lectures punctuated with rapid and short questions requiring the pupils to give short answers mainly consisting of one or two words. Here is an extract from a Form 4 geography class on world commodity production, and the country involved was Sweden ("T" stands for "Teacher" and in this case a graduate, and "S" for "Student." "Ss" indicates "students" giving chorus answer or no response):

T: Check the boundaries of Sweden. Who are its neighbors?

Ss: Norway.

T: Yes. What is in the south?

Ss: Denmark.

T: Denmark. (The teacher describes the countries bordering Sweden, its position in terms of latitudes and longitudes and asks pupils to check all that from the atlas as he lectures, and then resumes the questioning).

What can you relate to fertile soil of Sweden?

Ss: No response.

T: The country is rich because the land is very fertile. What else? You have a physical map in the atlas. What other factors that contribute to Sweden's richness?

S: Forests.

T: Why do you say so?

Ss: No response.

T: You said forests. What about forests?

S: Lumbering.

T: Yes. Another factor?

S: It is situated on the leeward side.

T: What does that mean?

S: There is no heavy rainfall.

T: Who can help him?

S: Leaching is not common.

T: Leaching is not common. (He resumes lecturing giving an explanation why Sweden is rich).

During the lecturing phase the teacher wrote on the chalkboard as he talked. Almost all pupils half-listened. Some pupils did not listen at all as they were busy jotting down his points. Eight of the twenty observations followed this kind of teaching whereby a phase of lecturing was followed by a short span of rapid teacher's questioning of the students. Incidentally, the whole lesson was based on a chapter from a textbook which students had. Unlike the first type of lecturing above, in this one at least a few pupils - six to be exact - were involved in some form of verbal interaction. It is this kind of questioning that some educators call "Socratic Method" (Paul, Binker and Martin, 1989). This approach, however, utilizes the IRF model discussed in chapter three.

(c) Using a lecture involving the description and explanation of some skills and how to use them, and having pupils apply them in a practical activity. In the only lesson of this kind I observed, the teacher introduced the three types of scale - simple statement, linear scale and Representative Fraction (RF) - and then described how to use the linear scale. She then required the pupils to use linear scales found in the atlas to measure distances on the maps and convert them into actual distances on the ground. The practical part took about six minutes and it had to be continued in the next period which I did not observe. During an interview with this teacher she said that the practical part was not meant to conclude the lesson or to evaluate the pupils but as the main body of her lesson. She had planned to conclude and evaluate after covering the three types of scales. In this lesson at least pupils were involved in some kind of activity. Yet, however, the teacher remained at "center stage" of the teaching and learning situation. The entire lecturing was as well punctuated with the questioning based on the IRF model, possibly unconsciously.

The body of the lesson was thus dominated by three forms of lecturing in all the lessons that were observed. Pupils also said that during lecturing, some teachers used textbooks instead of lesson notes as reference for exposition.

The Conclusion or Closure of the Lesson

Two types of activities were used by teachers to conclude their lessons. One activity was to review what had been covered by asking pupils several questions. In a lesson, this questioning involved not more than five questions of the Socratic type which were answered by about the same number of pupils or less. The other type of activity consisted of the teacher reviewing the lesson by making a verbal or written summary of what had been covered while pupils either listened or jotted down that summary. Of the twenty-six observations, eighteen lessons were concluded by review through questioning, seven by summary review and one had no conclusion. The time to conclude the lesson ranged from two to five minutes. The use of *review* was thus the most common teachers' activity not only to conclude the lesson but also to introduce it.

Assignments

In the lessons observed, assignments were given either prior to or after the conclusion, and the latter was the most common practice. Most teachers did not give the assignments. In only eight of the twenty-six observations made students were given some form of assignment, and all of them involved regurgitating what had been taught

(regurgitation assignments). Of these assignments only two were seatwork type done in the classroom as part of the lesson; the rest were homework type to be done either at home for day school students or during preparation time for boarders.

Of the six homework type assignments, four were written on the chalkboard by the teachers. The other two were dictated to the pupils. In one of these latter lessons, in a Form 3 class, the teacher dictated two long assignments and the work had "to be submitted in two days time without fail or else ten marks out of your score will be deducted from each assignment." As the teacher was reading the questions, over half of the class wrote nothing, probably because they did not understand what was being dictated. Other students were murmuring while others looked confused and frustrated having been bombarded with difficult, unexplained terminology in physical geography for most of the period.

More information about assignments was obtained from pupils by asking them to respond to the following questions: *(1) How often do geography teachers give you the assignments? (2) What type of assignments are you given? (3) Do teachers mark your assignments and give you the feedback?*

The answer to the first question was that in the teaching of geography pupils were given very few assignments. Some pupils said that while they did a lot of assignments in subjects like mathematics and languages (Kiswahili, English and French), very few or none of the assignments were being given in the teaching of geography and other social science subjects. Two pupils reported having been given assignments twice in a term, but the majority said they had not been given any since the beginning of the term.

As for the types of assignments provided, pupils reported that the common ones were the homework type given at the end of the lesson. Most assignments required pupils to make lists of things or write one or two sentences giving definitions, reasons, problems or factors. Some of the questions given in such assignments were:

(1) What is a map?

(2) List down any four essentials of a map.

(3) Name two ways by which the direction of a place or point can be expressed.

(4) Draw the map of Ghana to show (i) the cocoa producing areas and

(ii)the location of River Volta.

(5) Give two reasons for the decline of cotton cultivation in the "Old South"

of the USA.

(6) Give two main problems facing the Punjab irrigation system.

The essay type assignment involving writing a few pages in a creative and critically reflective way were nonexistent in the participating secondary schools. An analysis of the questions asked in the national examinations set by NECTA shows that assignment questions were modeled on the Examinations Council's style of questioning.

Regarding marking assignments and provision of feedback, all pupils reported that this was rarely done. Most of the assignments were not being marked nor was feedback provided. My inspection of pupils' notebooks showed that there was very little indication of teachers giving assignments and marking them, let alone doing so

systematically. Of the few assignments given, most were unmarked. The inspectors' reports available at the MOEC headquarters, responses by inspector or former inspector participants and those of some heads of schools all pointed to the fact that the problem of not giving enough assignments to pupils, marking them and providing corrective and constructive feedback was indeed very serious.

Notes

Another most common activity only next to lecturing was *note giving* by teachers; for pupils *note copying* was only next to passive listening and non-response to teacher questioning. Giving notes to pupils was so common in Tanzania's classroom that it had earned a name of "copy-copy method" from some participants. Note copying was one of the maior concerns addressed at length and sometimes very bitterly by all pupil interviewees. They said that copying notes was the most common activity they *did* in the classroom.

Reacting to the question, *How are notes given?*, pupils said that notes were provided in at least three forms. Some teachers got pupils to copy the main points which they wrote on the chalkboard as they taught. With this approach, some teachers allowed pupils to copy those points as they taught, but the majority of teachers wanted pupils to listen and copy the points after the lecture was over. The second form was to leave the gaps in the notes and have pupils fill in missing information as they copied the notes. This approach also served as a way of providing an assignment. According to pupils' responses, the most common way of giving them notes included having pupils copy mechanically essay-like long pieces of information, paragraph by paragraph, without any element of active thinking or understanding of much of what they copied. Those notes were from teachers' lesson notes, but some teachers copied them directly from the textbooks or some other reference material such as their own old school or college notes without simplifying the subject matter to the level of the pupils' capability to understand that content.

Notes were given at different times. Teachers who preferred to give notes during the lesson usually did so immediately after the conclusion or the body of the lesson. Other teachers gave notes after the lesson or sometimes even *before* the lesson was taught. Pupils said that some teachers gave notes on topics they had not yet taught and could teach those topics later, but other teachers proceeded to teach new topics without bothering first to discuss or elaborate the untaught topics. Usually pupils copied the notes while the teacher was in the classroom, but some teachers had the pupils copy the notes while they were absent. Such teachers handed the notes to the class and left, sent the notes to the class, had the pupils pick them from the teachers' offices, or wrote the notes on the chalkboard so that a pupil had to find time to copy them; pupils who did not have time to do so copied those notes from the notebooks of their colleagues.

Pupils noted that although the proportion of teachers who had the habit of sending the notes to the class or handing them to the pupils and absenting themselves was small, it was growing at such an alarming rate that in some schools pupils dubbed the practice as "teaching by distant education" and in other schools it was called "teaching by remote control." Furthermore, pupils said that very few teachers themselves wrote the notes on the chalkboard. The usual practice was for the teacher to have one pupil with good handwriting put the notes on the chalkboard.

Pupils also raised bitter complaints about the tendency by some teachers to give notes that were directly copied from the textbooks or other sources without any modification and therefore were difficult for the pupils to understand. "They are aware

that we don't understand much of what they get us copy day in day out and yet they keep on doing it," a Form 4 pupil complained.

In one school I found notes on the chalkboard in a geography room. There was no teacher, and pupils came in, copied the notes and left at different times for almost the entire afternoon session. The notes were on fluvial processes. One of the things that bothered me was the number of errors, both conceptual and linguistic, that were in those notes. An inspection of pupils' notebooks also revealed the same problem. For instance, those notes said: "For the river to form a delta, the following conditions must prevail. First, the river should not flow through a swampy area. Second, the river should not meander. Third, there should not be tides at the mouth of that river." The assumption is that if these conditions are absent the river will not accumulate enough silt to form a delta. A simple observation of rivers in Africa alone from an atlas indicates that, for example, river Nile has one of the biggest deltas in the world, and yet it flows through Kioga swamps in Uganda (note that its source is river Kagera in Tanzania) and it meanders. The river also experiences tidal waves at its mouth. In another school all pupils in a class had written the word "lagoon" as "laguun." These are just a few examples. Unfortunately, the majority of pupils who had no help to identify such errors and misconceptions and correct them, learned them as a normal part of their schooling experiences. Indeed all pupils expressed dissatisfaction with these unhealthy practices which tended to erode further the already fragile status of the teaching profession.

Questioning

Questioning or the use of a question was another major method that teachers used in their teaching, and was mentioned frequently by the pupils. The questioning process was almost one-way, involving teachers directing a series of verbal questions to a number of individual pupils or to the class as a whole. Students waited, sometimes nervously, to reply when called on either before or after the question was asked. Teacher questioning was one of the major sources of pupils' anxiety and threatening instructional climate.

Questioning was used for different purposes by teachers. It was used at the beginning of the lesson to review the content matter that was previously covered, to make a conclusion, and at times to attract the attention of the pupils. But most of the questioning was used as a lecturing device, to ensure that pupils followed what was being lectured. Indeed, almost all the questions asked by teachers fitted the "Initiation-Response-Feedback" (IRF) framework (Pimm, 1987; Edwards and Mercer, 1987), and could be described as "narrow," "convergent," "bounded" or "well-structured."

The number of pupils who were involved in answering the questions in a forty-minute lesson and a class of 40 to 45 or sometimes 50 pupils ranged between four in some classes to about six in others. In some classes only one or two more vocal pupils monopolized the question-and-answer sessions built into the lectures. During these sessions questioning was done almost entirely by teachers. Only occasionally were few pupils allowed to ask some questions towards the end of the lesson. The number of pupils who asked the questions during the lesson was far smaller than that which answered teachers' questions; they rarely exceeded three students. Again, usually those vocal or "bright" pupils tended to dominate the questioning. In fact teachers tended to direct most of their questions to such pupils.

Analysis of Classroom Activities

During classroom observations not only teachers' and students' activities were recorded but also the time each activity took. Time was recorded cumulatively; that is, rather than recording the time taken by a particular activity such as, for example, "one

minute for introduction," or recording what transpired after a certain interval, say, every minute, it was the time shown by the clock that was written at the beginning and end of an activity. For instance, in a forty-minute lesson which started at 8:00 am in the morning, "8:00" was recorded as starting time. If the teacher gave instructions to the class from that moment to, say, "8:03," this figure was recorded at the end of that activity, which also marked the beginning of the next activity. If what followed this activity was introduction of a lesson, a description of what went on would be made until the end of that activity, and if it ended at, say, "8:07," this figure would be recorded at the end of that activity. It was then possible to know that the first activity was "instructions" and took three minutes and the second was "introduction" and took four minutes.

Table 1: Time for Teacher and Student Activities

	TEACHER ACTIVITY																TOTAL
TEACHER	TA1	TA2	TA3	TA4	TA5	TA6	TA7	TA8	TA9	TB1	TB2	TB3	TB4	TB5	TB6	TB7	TIME IN MIN:
T1	2:30	4:00	2:00	2:00	2:25	5:30	1:50	--	--	45:00	--	--	5:45	1:00	--	8:00	80:00
T2	2:00	1:00	--	--	--	1:00	--	3:00	--	59:15	10:00	--	3:45	--	--	--	80:00
T3	0:40	--	--	--	--	--	--	1:15	--	67:00	3:00	--	5:00	2:00	1:05	--	80:00
T4	3:00	1:20	1:00	1:15	--	9:10	0:15	--	6:00	46:00	4:30	--	6:00	1:30	--	--	80:00
T5	2:00	2:00	2:00	4:00	1:00	1:45	--	--	--	35:45	22:30	1:00	4:35	3:25	--	--	80:00
T6	1:00	2:00	3:00	2:00	1:30	3:00	--	2:00	--	20:00	33:30	--	1:50	--	--	10:10	80:00
T7	2:00	5:00	2:00	4:00	3:00	2:10	3:15	3:15	--	06:30	12:40	--	3:30	3:10	--	9:30	80:00
T8	1:00	1:00	--	1:00	3:00	1:30	0:30	2:00	--	63:00	6:00	--	1:00	--	--	--	80:00
T9	3:00	1:00	1:00	1:00	--	2:00	1:15	--	--	40:45	--	--	10:00	5:00	--	15:00	80:00
T10	2:00	1:00	1:00	3:00	1:00	2:15	1:00	5:00	--	44:45	5:15	--	6:00	7:45	--	--	80:00
T11	2:00	1:00	2:00	2:00	1:00	2:00	2:00	3:00	--	30:00	22:00	--	7:00	5:00	--	1:00	80:00
TOTAL	21:10	19:20	14:00	20:15	12:55	30:20	10:05	19:30	6:00	476:00	119:25	1:00	54:25	28:50	1:05	43:40	880:00
PERCENT	2.4	2.2	1.6	2.3	1.5	3.4	1.1	2.2	0.7	54.3	13.6	0.1	6.2	3.3	0.1	5.0	100.00

	STUDENT ACTIVITY														TOTAL
TEACHER	SA1	SA2	SA3	SA4	SA5	SA6	SA7	SA8	SA9	SB1	SB2	SB3	SB4		TIME IN MIN:
T1	2:00	--	--	1:00	--	--	--	--	--	6:00	--	7:00	64:00		80:00
T2	--	--	--	--	--	--	--	1:45	--	3:30	15:00	--	59:45		80:00
T3	--	--	--	--	--	--	--	1:00	--	3:45	5:00	--	70:15		80:00
T4	1:00	--	0:30	--	--	--	6:00	--	--	5:00	4:00	--	63:30		80:00
T5	2:30	--	--	--	--	1:00	--	1:40	1:00	3:15	35:00	--	35:35		80:00
T6	1:30	1:00	--	--	--	--	--	1:00	2:00	2:00	42:30	13:00	17:00		80:00
T7	3:00	1:00	1:00	0:40	10:00	1:00	--	3:00	0:30	4:00	14:00	12:00	29:50		80:00
T8	--	--	--	--	--	--	--	2:00	--	--	11:00	--	67:00		80:00
T9	--	--	--	--	--	--	--	1:00	--	6:00	--	10:00	63:00		80:00
T10	3:00	--	--	--	--	--	--	4:00	--	5:00	7:00	--	61:00		80:00
T11	--	--	--	--	--	--	--	2:00	0:30	8:00	35:00	--	34:30		80:00
TOTAL	13:00	2:00	1:30	1:40	10:00	2:00	6:00	17:25	4:00	46:30	168:30	42:00	565:25		880:00
PERCENT	1.5	0.2	0.2	0.2	1.1	0.2	0.7	2.0	0.5	5.3	19.1	4.8	64.2		100.00

Table 2: Percentage of Time for Teacher and Student Activities

Category	Code of an Activity	Percentage of Activity	
		% of Each Activity	% of Teacher Activity
I. Teacher			
Praises	TA1	2.4	
Encourages	TA2	2.2	
Uses Student Ideas	TA3	1.6	
Asks Unbounded/Divergent Questions	TA4	2.3	
Asks Value/Disposition Questions	TA5	1.5	
Gives Appropriate Instructions and Guidance	TA6	3.4	17.4%
Provides Corrective Feedback	TA7	1.1	
Answers Students' Questions	TA8	2.2	
Engages Students in Practical Experiences	TA9	0.7	
Lectures	TB1	54.3	
Gives Notes	TB2	13.6	
Criticizes in Discouraging Manner	TB3	0.1	82.6%
Asks Bounded/Convergent Questions	TB4	6.2	
Asks and Answers His/Her Own Questions	TB5	3.3	
Commands and Drills	TB6	0.1	
Gives Regurgitation Assignments	TB7	5.0	
II. Student			% of Student Activity
Answers Unbounded/Divergent	SA1	1.5	
Answers Value Questions	SA2	0.2	
Initiates Ideas	SA3	0.2	
Expresses Value Judgments	SA4	0.2	
Student-Student Exchanges in Groups	SA5	1.1	6.6%
Student-Student Exchanges in other settings	SA6	0.2	
Participates in Practical Experiences	SA7	0.7	
Asks Questions to Teacher	SA8	2.0	
Student-Teacher Discussion	SA9	0.5	
Answers Bounded/Convergent Questions	SB1	5.3	
Takes Teacher-Given Notes	SB2	19.1	
Does Regurgitation Assignments	SB3	4.8	93.4%
Listens Passively and Does not Respond to Teacher Questions	SB4	64.2	

Due to problems in recording times which were experienced in the first four lessons, four lessons were excluded from this analysis. Thus, only 22 observations out of 26 are analyzed in this section.

During the analysis, codes were assigned to both teacher and student activities. "TA" stood for teacher activities that were regarded as *more* supportive to the fostering of an inquiring mind, while "TB" are activities which were seen as *less* supportive.

Similarly, "SA" and "SB" were regarded as more and less supportive respectively with respect to pupils' activities. Table 1 shows the time each activity took as well as totals and percentages of various activities. Table 2 summarizes the percentages of time for these activities.

Sixteen teacher activities were identified, nine of which were more supportive and seven less supportive to the development of an inquiring mind. With respect to pupils, thirteen activities were identified, nine of which were more supportive while four less so.

Note that I deliberately use the words "more" and "less" supportive. The reason is that it is possible for those activities that may be seen as "negative" to have a "positive" aspect in the promotion of an inquiring mind. As Mao Tse-tung (1966) said, every positive thing has a negative aspect and a negative thing has a positive aspect, and this phenomenon constitutes a unity of opposites in a contradictory but dialectical relationship. Lecturing, note giving and note taking, use of bounded, or well-structured questions, and listening, for instance, have a place in the fostering of an inquiring mind. It is the dominance or overuse of these activities and misusing them that are unlikely to cultivate an inquiry-oriented teaching and learning climate.

It is clear from Table 2 that the activities that are less supportive to the development of an inquiring mind were more dominant than those which are more supportive to the fostering of the inquiry. Of the teachers' activities, 82.6 percent were less supportive while only 17.4 percent were more supportive. As for pupils, 93.4 percent of their activities were less supportive only 6.6 percent more supportive.

Student activities that were most likely to promote the development of an inquiring mind such as students' initiation of ideas, student-student exchanges in groups and in other settings, student-teacher discussions, student engagement in practical activities, and student questioning were very rarely used. Although the data suggests that teachers used motivational activities to some extent (praising, encouraging, and letting pupils express value judgments, for example), but most of which constituted extrinsic rather than intrinsic motivation, they nonetheless spent a lot of time as good lecturers (54.3%) and givers of notes (13.6%). Both activities correspond with students' activities of taking teacher-given notes (59.1%) and listening passively and not responding to teachers' questions (64.2%). Two less supportive teacher activities which also took much of the teaching time included the tendency to ask bounded or convergent questions (6.2%) and to give regurgitation assignments (5%), both of which correspond to pupils' activities of answering narrow and convergent questions ((5.3%) and doing regurgitation assignments (4.8%).

The extreme rarity of practical experiences and the dominance of passive methods of teaching and learning reflect the predominance of theoretical teaching and learning. Student active and thoughtful participation in which a teacher rescinds control, invites pupils to converse in groups or as a whole class in a democratic and nonthreatening atmosphere so that verbal interchanges among them are maximized, and in which activities center on creative, reflective, critical communication whereby pupils metacognize, make their own decisions, question what is taken for granted, and construct and reconstruct their own knowledge, was largely missing in Tanzanian classrooms.

LESSON PLANS

The use of lesson plans was compulsory for all teachers (and tutors in teachers colleges). Some participants said that some teachers had been fired or reprimanded for failure to write and use lesson plans according to the format prescribed by the MOEC.

Some teachers reported that, for the majority of educational administrators, particularly school inspectors, to prepare for teaching meant largely to write a detailed lesson plan.

Most teacher interviewees did not like the idea of being forced to use a single lesson plan format. These teachers believed that teaching meant much more than using rigid plans, and that it was a creative activity which required flexibility. Other teachers said they had no time to write a lesson plan for each lesson they taught, and others found the practice even rather unrealistic. "We need to prepare for teaching, but not every lesson should follow one official format for all subjects. To stress the use of one format is tantamount to telling us that we should not think beyond it," a teacher observed. The prescribed format, it appears, was the one also taught in teacher education institutions. However, although most teacher participants seemed to write their lesson plans not according to the prescribed format, their actual teaching tended to be organized and follow that prescription. This fact may imply that the long exposure of teachers to this technical format as pupils at school, as student teachers in teacher education institutions and as teachers, all combine to instill into the their repertoire the automatic use of the technicalist skills that go with this lesson format. Consequently, while teachers may see theoretically how such a framework may hinder the promotion of an inquiring mind, in practice they tend to do that very thing they are opposed to. By the same token, I was amazed to find that some teachers who criticized the use of lecturing were themselves among the "good" lecturers when it came to their actual practice. A professor participant also wondered why teacher educators lectured methods of teaching to their student teachers while they were certain that inquiry-oriented teaching and learning was the best way of preparing teachers.

TEACHERS AS PUPILS

In order to find out how similar or different teachers were taught while they were pupils as compared to the students they were teaching, these participants were asked to react to the same question that was posed to their pupils: *How were you taught geography when you were secondary school pupils?* This teacher reflection on their learning experiences as pupils was intended to provide some data that would be an indicator of the extent to which the teaching and learning practices had shifted toward the achievement of an inquiry goal since 1967.

Table 3: Years When Teacher Participants Were Secondary School Pupils

Years	'O'-Level (Forms 1-4)	'A'-Level (Forms 5-6)
1965-1969	1	1
1970-1974	8	-
1975-1979	3	2
1980-1984	1	3
1985-1989	-	7
TOTAL	13	13

Table 3, drawn from the demographic data of teacher participants, shows when these teachers were in a school system at both O-level and A-level. It can be noted that all teachers except one had entered Tanzanian secondary education system after 1967, the year that marks the beginning of the implementation of the goal of developing an inquiring mind. The only exception was a teacher who was promoted to Form 1 in 1965.

The twelve teachers, therefore, were supposed to go through some kind of a school (and teacher education) program that fostered an inquiring mind before they became teachers.

The responses of all teachers revealed a strong similarity between what they believed about how they were taught as secondary school pupils, and the descriptions made by their pupils on how they were being taught. All teachers believed that, like their pupils, they were mainly also taught through lecturing including the same questioning techniques, taking notes, memorizing information and regurgitating it upon signal such as assignments and tests, and passive listening. Textbooks predominated as the medium of instruction, and inquiry-oriented approaches were seldom evident.

Some teachers, however, found that, despite this similarity, on the whole their teachers engaged pupils in some inquiry-oriented experiences which were rarely experienced by pupils today. Such activities included practicals in the classroom and field work, group work, whole-class discussions and debates, regular projects, participation in community development programs that provided them the opportunity to learn from the "real" life settings, excursions and visits, collection and analysis of samples of different artifacts, and writing accounts of their observations. Teachers recalled the practicals they did including surveying, drawing of map projections and simple sketch maps, cross sections and transect diagrams, recording of various statistics and analyzing them, conducting social, economic and other surveys and many such activities which were missing in their own teaching. Indeed, a number of teachers decried the unhealthy practices of those teachers who had pupils copy untaught notes or taught by "remote control" and found such practices as unthinkable when they were pupils. "Commitment and responsibility have waned," an old-timer teacher commented painfully.

These departures from the current teaching situation notwithstanding, all teachers agreed that the teaching situation today was basically not different from the one they went through as pupils. All teachers believed that they were mainly teaching as they were taught in schools. Even other participants including administrators, teacher educators and curriculum developers believed that this was the case in all educational institutions in Tanzania. "It is a persistent and notorious vicious circle," a retired education lecturer noted.

SUMMARY

In this chapter, an attempt has been made to capture the teaching situation in Tanzanian secondary school classroom and to ascertain the extent to which teaching and learning have shifted towards reaching the goal of developing an inquiring mind since 1967. The evidence suggests strongly that the teaching situation had hardly changed since then, and that in some respects it may have worsened. As other studies cited in chapter one revealed, the teaching style has remained conventional in nature. Teachers also agreed that they continued to teach the way that they had been taught; a way better described by Freire's (1971) commercial metaphor of "banking." This being the case, the question arises: ***What reasons have caused teachers to teach in a manner that hardly develops an inquiring mind despite the existence of this goal for a long time now in Tanzania?*** The next four chapters address this crucial question.

CHAPTER SIX

FACTORS RELATED TO CURRICULUM DEVELOPMENT AND IMPLEMENTATION

INTRODUCTION

In this and the next three chapters the study focuses on the factors that have tended to influence the development of an inquiring mind in secondary schools. The major question explored in these chapters is: *What factors have influenced the teaching of the goal to develop an inquiring mind in Tanzanian secondary schools?* This chapter addresses one set of these factors, the set related to curriculum development and implementation.

This chapter is divided into two main sections. The first section deals with questions related to the conceptualization of "an inquiring mind." The purpose of this section is to find out how the concept of "an inquiring mind" was *understood* by various participants. The rationale of this choice was the belief that the degree of its conceptualization affects its operationalization in the curriculum. The second section focuses on issues of curriculum itself - its intents and the philosophical, psychological and other rationales and principles which have influenced the determination of its content and process of its formation. The purpose of this discussion is to explore the factors related to the aspect of *developing* an inquiring mind. The geography syllabus for secondary schools is used to illustrate these issues and related factors.

CONCEPTUALIZATION OF AN INQUIRING MIND

Participants' Perception of An Inquiring Mind

To ascertain the extent to which the goal of developing an inquiring mind had been conceptualized, interpreted, and understood in relation to teaching and learning, all participants except pupils were asked to respond to the following questions: (1) *How is the concept of "an inquiring mind" conceptualized and understood by various people and in educational literature in relation to teaching and learning? (2) What is your own view or understanding of the concept of "an inquiring mind?"* For some participants this question was reframed and asked as follows: *If you were to talk about this concept of an inquiring mind to a class/group of student teachers, what would come to your mind?*

The responses of all participants except one suggested that the concept of "an inquiring mind" had largely not been understood by people who had the responsibility to interpret and translate it into actual classroom experiences. For some of those educators who had a better idea of this concept and wanted to operationalize their conceptualizations, or those who wanted to pursue it further, other factors stifled their ambition and efforts to do so.

Regarding this problem of conceptualizing an inquiring mind, an official who had worked as a curriculum developer at the ICD and had delivered lectures on curriculum development in the Faculty had this to say:

> The problem is our own failure to define what this inquiring mind constitutes. We haven't gone beyond just making broad statements. In order to operationalize it in the teaching-learning environment we need to generate more specific tasks, skills and attitudes which are related with an

> inquiring mind. This is lacking in our educational system. If we were serious we should have actually operationalized this concept.

Other participants expressed a similar concern by posing questions that would have been raised if an attempt to conceptualize an inquiring mind would have been made: "What do you want the pupils to do exactly in order to show that they really are inquiring?," "What content do you have to assess and how, if teaching and learning are geared to the development of an inquiring mind?"

A professor participant from the Faculty of Education had the following to say about the conceptualization of an inquiring mind in teacher education programs at degree level:

> At this university we haven't spelt it out precisely. An inquiring mind has not been conceptualized and put into classroom practice as well as in our lecture rooms. We have failed to translate it in terms of actual classroom activities both on the part of the pupil and educator. We have spent a lot of time talking about general things on it. The discussion has remained on the surface, repeating sentences and quotations from the ESR booklet.

While the majority of participants saw lack of appropriate interpretation of an inquiring mind as one of the most serious obstacles that have hampered the fostering of this goal, one administrator participant from the Department of Secondary Education at the MOEC's headquarters believed that teachers "know the concept, but *how* to do it is what is the problem. How to involve the students to develop an inquiring mind is the question. Teachers are lacking in the application of the concept," he maintained. But teachers themselves agreed that they had difficulty comprehending what an inquiring mind really meant. This instance may be one where administrators wanted to maintain the status quo.

The second question was intended to pursue the conceptualization of "an inquiring mind" from a more specific perspective by having each participant reveal the meaning he or she held for it. It was hoped that this approach would help uncover the extent to which the participants had the vision of an inquiring mind.

Three categories of responses were identified. The first category included the participants who held the view that an inquiring mind constitutes one or a combination of several "basic" and "complex" cognitive processes, practical skills, and dispositions. Table 4 shows these elements of an inquiring mind and the type and number of participants who suggested them. The figures in brackets indicate the total number of participants in each type, and the figures against each element within the Table indicate the number of participants who cited that element.

Table 4: Inquiry Elements Cited by Participants

Elements	EDUCATORS			ADMINISTRATORS				FREQUENCY OF BEING CITED
	TS (13)	TU (2)	FP (1)	NECTA (2)	ICD (2)	MOEC (6)	H/M (4)	
Analysis							1	1
Synthesis							1	1
Evaluation				1			1	2
Hypothesizing				1				1
Questioning	4	2	1			5	1	13
Reading Skills						1		1
Problem Solving	1	2	1	1	1	2	3	11
Creative Thinking	2	1		1	1		2	7
Critical Thinking			1	1		2		4
Decision Making						1		1
Curiosity						1		1
Delaying Judgment						1		1
Self-confidence			1					1
Self-actualization			1					1

TS = Teachers; TU = Tutors in TCs; FP = Faculty Professor; H/M = Heads of Schools

Four elements were cited more frequently than others: *questioning*, *problem-solving*, *creative thinking*, and to a lesser extent *critical thinking*. The least frequently mentioned elements were the so-called "basic" processes which included *analysis*, *synthesis*, *evaluation*, and *hypothesizing*, and the dispositions which, included *curiosity*, *delaying judgment* (or tolerance for ambiguity), *self-confidence*, and *self-actualization*. One participant suggested that *reading skills* were also a component of an inquiring mind.

These findings are of course inconclusive, especially considering the limited number of the participants involved in the study. However, Table 4 reveals interesting observations. One of them is the significance practitioners - classroom teachers and teacher educators (TU and FP) - and MOEC officials attached to the use of *questioning* in teaching and learning. Recall that questioning was found to be one of the most cherished methods of teaching. The association of questioning with an inquiring mind seems to be a strong belief among educators and educational administrators, including a head of a school; but it was more pronounced among the MOEC officials and teachers. Indeed three MOEC administrators believed that an inquiring mind involved only the process of asking questions. An administrator from the Department of Secondary Education stated:

> My personal opinion is that inquiring mind is a process of making somebody think. Making somebody think means making one ask questions.

The other two officials believed that the "why" question was the most important question, "a challenging question that can make students think." Another administrator believed that the "why" question "enables us to know the reasons. We must know the causes, and we must be able to separate the causes from the symptoms."

One administrator, a former curriculum developer, did not share with the others the belief that an inquiring mind is defined solely in terms of a question:

> We have tended to think of inquiring mind just in terms of posing questions. Posing questions is just one of those aspects of inquiry. But it is not really the only major one.

Other participants viewed questioning as a skill related to other inquiry elements. For instance, some of them associated a question with critical thinking: posing a question that engages the learner into "making a critique," "going deeper into issues" or "criticizing." One teacher associated the question with skepticism (a questioning attitude) and curiosity (an attitude of wanting to know).

The majority of participants who defined an inquiring mind as problem-solving also viewed this process as involving "solving a problem" in a "question" sense - that is, the kind of "well-structured" problems found in school textbooks. Two administrators from MOEC and a teacher defined problem-solving as consisting of *scientific method.* One administrator stated:

> An inquiring mind includes the ability to solve problems - that is, problem-solving process as described in scientific method.

One head of a secondary school viewed problem-solving in terms of Bruner's (1966) notion of "discovery." He said that "problem-solving involves discovery as suggested by Bruner - that is, having pupils find out for themselves by the use of their own minds."

Teachers and heads of schools tended to emphasize creative thinking but not critical thinking which was cited by two MOEC officials, a professor and an examination officer. The least mentioned "macro-process" was decision-making which was cited by only one participant from MOEC headquarters. One MOEC official, a former lecturer, who viewed an inquiring mind solely in terms of critical thinking defined it as follows:

> If education is to make people self-reliant it must develop in them the capacity for independent and critical thinking. Critical thinking means the ability to analyze evidence into facts and assumptions; the ability to recognize stated and unstated assumptions which underlie certain assertions; the ability to demand evidence in support of conclusions which one is being pressed or persuaded to accept; the ability to select significant words and phrases which are used in discourse; the ability to create meaning, to see meaning in whatever is being said. This is what I understand by inquiring mind.

Another observation from Table 4 is that both the "basic" processes and dispositions were mentioned very rarely and none by practitioner educators. Another

point is that all participants except one whose definition of critical thinking is quoted above, cited inquiry elements without elaboration or unpacking them to indicate what they really meant to them.

The second category of participants gave responses about their views of an inquiring mind which were rather vague or too general to enable one to grasp the essence of this concept. These suggestions included, for example, expressions such as an inquiring mind is "looking for information," 'investigating," "inquisitiveness," "ability to conduct an investigation," "theory building," "an attitude of mind as well as an application of skills," "an inherent human trait possessed by people who haven't gone to school," and "part of human nature."

The third category included the participants who admitted that they did not have any view of an inquiring mind. This group, unfortunately most of whom were teachers and particularly diploma teachers, accepted that they were unable to conceptualize an inquiring mind. They included nine teachers; eight of whom were diploma teachers and one graduate; one head of a secondary school and one curriculum developer. "I have no idea about it" was a common answer. One key reason these and other participants gave for having been incapacitated to have a coherent view of an inquiring mind or lack it completely was that they had never been taught this concept anywhere in their schooling either at school, college, or university.

Research And Publication

Research and publication about the concept of an inquiring mind and dissemination of information on it were assumed to be an indication of the extent to which the goal had been investigated and debated about in educational literature, and the existence of the action directed towards its realization. To find out if this were the case, all participants except pupils were requested to respond to the following two questions (1) *Do you know any research or studies done on this goal of developing an inquiring mind? and (2) Do you know any articles, books, or other references written by Tanzanians or other people on the concept of "an inquiring mind" and how to develop it in teaching and learning?*

Almost all participants said they knew "none at all" with respect to both questions. Only two interviewees, one MOEC official and an examination officer from NECTA, cited their own work. A former zonal chief inspector of schools observed that "we have fallen victim to a failure on the part of all the educators to look critically at what we teach, how we teach it, and how we would develop inquiry-based curriculum and benefit the learners." An examiner found that "the very little research and literature available on this issue consists of casual comments and only touch the tip of the iceberg."

One indication of lack of research on an inquiring mind in Tanzania is partly revealed by the list of studies which CURE rendered its advisory role and granted research clearance between 1988 and 1990 (Ministry of Education, 1990a, pp. 29-31). Of the forty-five titles included in this list, none addressed directly the concept of an inquiring mind and its development. The same observation applies to the "research agenda" (World Bank, 1990, pp. 28-30) of the MOEC's priority studies that were to be undertaken with the funding of World Bank under the Eighth IDA project agreement. Indeed, some of the studies in both lists deal with issues of teaching and learning such as testing, teacher talk, double sessions, classroom interaction analysis, use of teaching time, evaluation of textbooks, comparing student achievements in different instructional programs and school contexts such as pilot schools with libraries and those without them, and problems of funding education. Yet these studies relate to the questions of

developing an inquiring mind peripherally and casually. In fact some research proposed under the Eighth IDA were based on empiricist and positivistic process-product research paradigm which is in large measure antithetical to the reaching of an inquiry goal. Besides, the proposed studies exclude completely the teaching of social sciences, the humanities, the fine and theater arts, and physical education. The assumption seems to be that every student will emerge out secondary education as a natural scientist and technician.

It is very surprising to find that the development of an inquiring mind was also not a priority research agenda of the Faculty of Education of the University of Dar-es-Salaam. Of the over three hundred and sixty studies listed by the Faculty which were undertaken between 1974 and 1986, over sixty were at graduate level, most of which were Masters theses. Of these graduate studies only one done by Kotta (1986) seems to relate to the development of an inquiring mind, though it was not her intention to investigate this goal. Kotta investigated the adoption of "discovery methods" in preservice teacher education programs in Tanzanian Teachers' Colleges. An investigation in the University's main library and the Faculty's library revealed absence of studies done in Tanzania or elsewhere on the development of an inquiring mind. Kotta's (1986) study defines *discovery methods* as:

> those methods which involve a teacher in a role of coordinator or guide of inquiry. The materials at hand are used as sources of hypotheses to be tested by students through activities. The techniques used in this learning situation are characterized by seeking, discovering, re-organizing and testing of knowledge. These discovery methods are also referred to as "inquiry" methods or "student-centered" methods (p. 8).

As this definition suggests, Kotta associates "discovery" with "problem-solving" in the sense of "scientific method" as noted earlier. And this scientific method, according to her, is what constitutes "inquiry method." She rooted her study in the *discovery-learning paradigm*, and she acknowledges this by stating in this study that her conception is similar to what educators such as Bruner and Gagne have said on discovery methods.

Kotta is not the only person in Tanzanian educational thinking to equate inquiry with scientific method. A review of the study by Ndabi (1987) which explored the extent to which science examinations in Tanzanian secondary schools tested scientific and technological skills, Gunze's (1988, pp. 23-26) definition of "inquiry," the official NECTA's (1991) guidelines on the conduct and administration of continuous assessment in secondary schools and teachers colleges, and Omari and Kaniki's (1974) guidelines for writers reveal strong advocacy and domination of the view of inquiry as scientific method.

An alternative view of inquiry is provided by Ndunguru (1976). Unlike other Tanzanian educators who hold an empiricist-positivist view of inquiry, Ndunguru disparages the sole dependence on scientific method as the only source of authentic, "true" knowledge and defends the relevance to a certain degree of *metaphysics* and *ethics*.

> We seem to have discredited metaphysics on the grounds that there is not much to be gained by it as it was understood in the past; for it is doubtful if there is a thing as the discovery of fundamental truths by mere speculation detached from scientific observation. Merely to speculate on truth, and to pronounce dogmatic conclusions had better be abandoned. Similarly, ethics does not seem to be a very respectable field of study, useful as it is, for there are no ethical proofs such as

> ethical proofs such as could lead independent investigators to arrive at the same truth (pp. 4-5).

Ndunguru finds that, indeed, it is because of these doubts about the place of metaphysics and ethics in the scheme of human knowledge that some reputable universities omit them in their curricula of studies, arguing that these subjects contain no objective truth, which is the task of the universities to pursue. Then Ndunguru argues:

> But to think that one can carry out the critical examination of issues and arguments without making some assumptions is a myth. Moreover, there are certain fundamental questions like the existence of God, which we may want to discuss, but which, alas, we cannot even begin to discuss without resorting to metaphysical assumptions. We must also remember that when we accept the scientific method and scientific truths we are implicitly accepting certain metaphysical implications or assumptions (p. 5).

Ndunguru also believes that although it is true that no philosopher is a moral authority to lay down rules about human conduct, ethical investigations, like metaphysical ones, are still useful:

> Ethical studies may get people to examine how they come by the moral judgments they make; that is, they can make them weigh the pros and cons for holding or not holding certain moral beliefs. There is a value in seeing to what extent people are prepared to abide by their moral convictions or judgments. For these reasons I feel that ethics has a place even in universities (p. 7).

Thus, in Tanzania, as elsewhere, educators and other discussants hold different paradigms about the questions of inquiry and the nature of knowledge and how it is acquired. However, it seems that the empiricist, positivist, and rationalist paradigms are more dominant than those in the humanistic, social constructivist camp. The current emphasis to "catch up" in science and technology in Tanzania is likely to aggravate this lopsided view of inquiry and the nature of knowledge.

To conclude this section, it was found that participants in this study either held a narrow or parochial view of an inquiring mind or did not have any vision of this educational goal. Most tended to define an inquiring mind in terms of one or two "basic" and/or "complex" processes and dispositions without attempting to unpack those elements. Even the participant who elaborated on critical thinking had a narrow conception of an inquiring mind in that he also confined it only to this inquiry component. One participant suggested a more inclusive list of what he believed were elements of an inquiring mind which included "creativity," "critical thinking," "an ability to conduct investigations," "evaluation of knowledge and materials learnt," "theory building," "hypothesizing," "self-confidence," and "self-actualization." However, the list reveals a lack of conceptual framework to organize his ideas in a coherent manner. All the participants agreed that the concept of an inquiring mind and its development have remained largely unconceptualized and hardly understood.

The participants also said there was a serious lack of research and literature on this issue. They all said that studies directed at understanding the goal of developing an inquiring mind and trying to find out the possibility to translate it into actual teaching and learning activities were utterly absent in Tanzanian educational system. The few studies and literature which seemed to relate to this issue did so casually or peripherally and

tended to be based on empiricist, positivist and rationalist paradigms and consequently held a parochial and one-sided view of an inquiring mind. This being the case, it is not surprising to find that inquiry is equated with scientific method by the majority of people. It seemed that qualitative research was little known and hardly utilized and probably still regarded as "unscientific" and thus despised and rejected by a good number of educators, educational administrators and researchers in Tanzania.

The tendency to *mandate* in schools and teachers colleges certain notions of inquiry by MOEC and its parastatal organizations was another severe handicap that stifled educators and their students to construct and reconstruct their own view of an inquiring mind and create their own knowledge and materials. What was needed was to disseminate to teachers and teacher educators research results and reading materials which would help them to raise questions and conduct investigations of their own. This focus would empower them academically and professionally. Unfortunately, those people whose responsibility was to help teachers understand the inquiry goal and translate it into appropriate classroom activities had themselves held a very parochial vision of an inquiring mind; or they had even ideas which were antithetical to the reaching of this goal. Consequently, as one participant put it, "we are flopping here and there remaining shallow and incoherent, and not doing much about it."

It is also interesting to note that even the most critics of ESR such as Brian Cooksey who welcomes "the end of ESR" (Cooksey, 1986, p. 183) say absolutely *nothing* about this crucial goal of developing an inquiring mind. Even other analysts of the policy of ESR (Saunders, 1982; Kassam, 1983; Mosha, 1990) have failed to see the critical role of this goal in Tanzanian educational system. In their discussions they have tended to focus merely on the aspects which were intended to be employed to foster it.

SECONDARY SCHOOL CURRICULUM

This section explores the factors that relate to the development and implementation of secondary school curriculum. Responsibility for developing the curriculum for all schools, teachers colleges, and technical colleges is vested in the ICD, as defined by the Parliament in the 1975 Institute of Education Act. Secondary school syllabi were written on the basis of traditional disciplines. The geography syllabus which was in use at the time of field research was compiled by the Institute in 1976. The ICD used one format for all syllabi across the country. Each syllabus usually opened with a brief introduction outlining objectives for the subject and the school level. This was followed by a matrix with details of prescribed topics and sub-topics, and lastly a list of textbooks. Some syllabi included specific objectives and teaching and learning strategies for each topic, basic equipment and facilities (teaching aids) required for every topic or group of topics.

THE NATURE OF AND BASIS FOR CURRICULUM DEVELOPMENT PROCESS

An analysis of the 1976 geography syllabus (Ministry of National Education, 1976), and of the past ones (Mbeo, 1975 pp. 375-396) reveal that the process of geography "syllabus development" has been limited to a mere *listing of topics* to be taught and references from which the prescribed content has to be copied. A comparison of the 1976 geography syllabus, with the past three ones which were drawn in 1947, 1955 and 1973, indicates an insignificant difference in their content and process. Syllabus development process has for decades remained a mere act of changing a list of topics within a discipline by "addition-reduction-substitution" process. Thus, for Form 1-4 syllabus of Regional Geography, Asia is reduced to China, the Middle East Lands and the Indian Sub-continent; Europe is reduced to the Rhinelands; America is reduced to North America, and particularly to the study of some areas of USA, and nothing is included

from Latin America. North America substitutes Australia and New Zealand; more content is added to the Regional Geography of Africa in which Tanzania is subsumed within the study of East Africa. The Forms 5-6 syllabus duplicates at greater depth a detailed coverage of Africa and either Western Europe or USA and former USSR. This process seems to have been based on a number of assumptions and metaphors to which this discussion focuses.

Academic Rationalism

Tanzania's curriculum development and implementation have been based solely on academic rationalism and its concomitants, and this has been so since the beginning of formal education in this country during the colonial times. This paradigm has guided most of educational deliberations at all levels of formal education in the educational system. Much of its effects on the thinking and practices of educators and others concerned with educational matters are tacit and thus not easy to detect. Academic rationalism has been defined in chapter three and will be referred to throughout this and other chapters. Let us first look at how it relates to the business metaphor.

Business Metaphor

One assumption of academic rationalism is that schools should only teach disciplined knowledge or "funded" knowledge. And, for knowledge to be recognized as disciplined, it must be transformed from the real world environment into the funded form by subject specialists. Anything untransformed by a discipline specialist into such knowledge is what Phenix (1968) claims to be "nondisciplined knowledge unsuitable for teaching and learning" (p. 133). The underlying assumption is that disciplined knowledge should necessarily be accepted and approved by an "authority" as a perfect, correct, and true record. The teaching and learning should not draw its content from real world "extended" (Found, 1971) environment consisting of unfunded content, but from disciplined knowledge alone found in great books of the intellectuals. Teachers and learners do not need practical experiences to construct their own knowledge from the real-world environment because this process is assumed to be the preserve of a discipline specialist who can successfully fund "pure" and "durable" knowledge. Thus the notion of *division of labor* becomes embedded in this funding process of academic rationalism. The funding of knowledge becomes the noble job for the *specialist producer* and the learner and teacher become *consumers* who merely use the *specialist product* (Mbeo, 1975, p. 86). With this *business metaphor*, theorization and training of the mind advocated by academic rationalists becomes mere recapitulation, rubber-stamping, and regurgitation of what the discipline specialist does. Phenix (1968) expresses this view when he advocates that "education should be conceived as guided recapitulation of the process of inquiry which gave rise to the fruitful bodies of organized knowledge comprising the established disciplines" (136). For Phenix, too, and other academic rationalists, the process of funding knowledge of all the disciplines is the scientific method. Indeed the advocacy of the scientific method by academic rationalists and its concomitant business metaphor can be seen operating in Tanzanian educational institutions and secondary schools. This advocacy may also partly explain the dominance of the conception of inquiry as scientific method by the majority of scholars and educators in Tanzania.

The business metaphor is crucial in understanding the basic assumptions that underlie the *implementation* of a curriculum rooted into academic rationalism which also shares the philosophical roots with empiricism and positivism. The factory metaphor came to the field of education largely, if not wholly, through Frederick Winslow Taylor's (1911) theory of traditional *scientific management*. Many ideas that shaped his theory stem from his experience and research in America's steel industries. For example, he

analyzed the loading of pig iron onto railroad cars at the Bethlehem steel plant. Noting certain inefficiencies, he devised techniques for increasing the workers' productivity. His techniques were "scientific" in the sense that they were based on careful observation and task analysis. He determined, for example, that the equipment the workers were using was inadequate to the task. He substituted standardized shovels and other work equipment which were designed specifically for the tasks to be done. He then instructed workers to do exactly as they were told and only as they were told. By closely adhering to his methods and by using the equipment he provided, the workers were able to increase their average loading per day from 12 to 47 tons. Taylor felt that the secret to scientific management was a *compliant* worker who did not think too much but instead followed directions exactly.

Traditional scientific management represented a classic autocratic philosophy of administration within which workers were viewed as appendages of management and as such were hired to carry out prespecified duties according to the wishes of management. These ideas carry over to school supervision and teaching and learning when teachers are viewed as *implementers* of highly refined curriculum and teaching systems and where close supervision is practiced to ensure maximum fidelity (for example by inspectors) - that teachers are teaching in the way in which they are supposed to and that they are carefully following approved syllabi and guidelines and teaching protocols. Control, accountability, and efficiency are emphasized in scientific management within an atmosphere of clear-cut manager-subordinate relationships. The framework is characterized by operational emphasis on domination, inspections, rigid control and robotish behavior on the part of the worker (Sergiovanni and Starratt, 1988 pp. 8-9).

Skinner's behaviorism, which essentially sees teaching as "scientific instructional management," has a lot in common with Taylor's model of scientific management; both frameworks also embed the "military metaphor." Although, according to Tanzania's principles of cooperative endeavor, collective leadership and workers' participation in the affairs of the society, teachers were not supposed to live such models at workplaces, much of what was actually taking place in practice in schools approximated the business and military metaphors. Academic rationalism means that teachers and their pupils have to teach and learn what is given them by both academic specialist and the management, and that fidelity has to be observed to the letter.

Since academic rationalism embraces the business metaphor, it may also be viewed as being based on a perspective of curriculum implementation which Aoki (1983) calls curriculum *implementation as instrumental action* rather than *implementation as situational praxis*. Aoki finds that instrumental implementation of curriculum embeds "a business metaphor, one in which curriculum producers offer something to curriculum consumers" (p. 5), the paradigm which "views implementation in terms of a unidirectional flow ... In this paradigm experts produce for non-experts who consume. It is the paradigm of the relationship between the haves and have-nots. In program development under this paradigm, curriculum experts produce programs for the consumers - the teachers and students" (p. 6). According to Aoki, the business metaphor is "technological," committed to a systematic rational approach to change. This metaphor, which can be associated with the flourishing in education of such movements as competency-testing and management by objectives, and idioms of behaviorism, structural functionalism, and system theory, can be traced to the efficiency movement of the industrial engineering (Aoki, 1983 p. 6).

Aoki observes that, according to the perspective of implementation as instrumental action, competent teacher-implementers are ones who have skills and techniques oriented toward efficient control. Such a know-how-to-do view of

implementation is embedded in scientific and technological thought/action framework which reduces human competence to instrumental reason and instrumental action. Here, the teachers are seen as rule-oriented, rule-governed being cast within a manipulative ethos, an ethos in which even their future is conceived in terms of rules. Instrumentalism has been reinforced by positivistic thought, by an "intoxication" with the technical power of science and technology, and by the development of business management techniques. In this conception, implementation carries the fancier labels of *diffusion* and *adoption*. The instrumental view of implementation minimizes or neglects the interpretive activities the teachers are engaged in when they encounter the curricula; effectively strips them of the humanness or their being, reducing them to beings-as-things, technical beings devoid of their own subjectivity, a process which is oppressive (Aoki, 1983 pp. 6-9).

The business-scientific-instrumental view of curriculum implementation constitutes the very fabric upon which academic rationalism is based. Instrumental implementation is the means for *installing* academic rationalistic, discipline-based curricula dictated from the top to the classroom by curriculum producers from the MOEC headquarters, ICD, NECTA, international organizations such as the World Bank and content specialists who fund knowledge in mandatory textbooks and reference materials, some of whom indeed see the classroom as market place for their divine products. Aoki (1979) also finds such a curriculum having an *empirical-analytical orientation* in which the curriculum is viewed as a commodity to be presented for students' and teachers' consumption.

Rationale for Curriculum Development Process

Evidence exists to show that Tyler's (1950) rationale is the major conceptual framework that was being used in Tanzania to guide the process of curriculum development, and the focus of teacher education programs. Tyler advocates that *curriculum sources* should include *studies of the learner, studies of contemporary life outside the school,* and *suggestions from subject specialists.* The crucial first step in the Tyler's rationale on which all else hinges is the statement of *behavioral objectives.* The objectives are to be drawn from these three sources. Four questions constitute the framework of this rationale: (1) What educational purposes (objectives) should the school seek to attain? (2) How can learning experiences be selected to achieve the objectives? (3) How can learning experiences be organized for effective instruction? (4) How can effectiveness of the curriculum be evaluated?

Taba (1962) whose work has been included in the content of Tanzania's teacher education programs, built on Tyler's rationale to formulate her seven steps to guide curriculum developers: (1) diagnosis of needs; (2) formulation of objectives; (3) selection of content; (4) organization of content; (5) selection of learning experiences; (6) organization of learning experiences; and (7) determination of what to evaluate and ways and means of doing it.

That Tyler's rationale has been a dominant model guiding the thinking and practice of Tanzania's curriculum developers, educators, and educational administrators was revealed by a response provided by a MOEC official participant who was a "curriculum expert" and had participated in the CID's discipline panels to advise on the curriculum matters. The official had this to say regarding the curriculum process:

> In developing any program first we have to change the level where the teachers are going to operate. Then we should use our specialists. These specialists should use the principle that, here is the society, these are the needs of the students, then here is the discipline, here are the subjects. ...

> So, we should use that model of curriculum development to strike the balance between the student himself and the community and the discipline to be taught. What are the needs of the students? What are the needs of the subject? We should be able to select content from there ... Now, this type of work needs some subject specialists.

This response demonstrates clearly the learner-society-subject framework which constitutes the backbone for Tyler's rationale.

Curriculum literature in Tanzania regarded as authentic educational discourse has also advocated the utilization of Tyler's rationale in the process of curriculum development and implementation. Ndunguru (1976), for example, states,

> It is true that *any* curriculum planning *begins* with the clear enunciation of educational aims ... what remains for curriculum planners to do, is first, to break down the broad aims into specific educational objectives which can be translated into instruction; secondly, to select, on the basis of a number of criteria, adequate and relevant subject matter; thirdly, to suggest appropriate learning experiences and to indicate how these learning experiences and the content are to be integrated and organized; and fourthly, to suggest ways of evaluating the total educational effort (pp. 67-68).

These four stages constitute exactly Tyler's four questions and have a very close resemblance to Taba's seven stages.

Ndunguru further advocates Tyler's rationale when he writes about the "*basic referents or source factors*" in relation to the "problems of curriculum orientation" (p. 68). He says: "However one considers education, one cannot fail to see it as involving three basic elements namely: the child; the cultural heritage which is being handed on; and the social milieu within which it takes place ... The curriculum for education, then always has a three way orientation: towards the learner, the society, and the particular portions of the cultural heritage to hand on to the young" (pp. 68-69). Then Ndunguru defines "*cultural heritage as expressed through the disciplines of knowledge*" (p 69). This conception of "cultural heritage" is academic rationalist. To the academic rationalists, "transmission of cultural heritage" means imparting funded knowledge of the traditional disciplines and associated values and attitudes. As Eisner and Vallance (1974) note, with academic rationalism the legitimate function of schools becomes "that of cultural transmission in the most specific sense: to cultivate the child's intellect by providing him with opportunities to acquire the most powerful products of man's intelligence. These products are found, for the most part, in the established disciplines" (p. 12). Ndunguru's notion of cultural heritage bases on the same notion held by academic rationalists. His book was one of the basic references in all teacher education institutions and curriculum development circles in Tanzania.

The influence of Tyler's model in Tanzania is as old as the majority, if not all, of teacher education institutions including the Faculty of Education. A curriculum developer participant from the ICD agreed that this was the major curriculum conceptual framework that was being used in their panel deliberations. Actually, all the syllabi begin with "objectives," followed by disciplined content, and then suggestions of teacher's methods and pupils' experiences sequenced according to some criteria, and evaluation.

Eisner and Vallance (1974, p 3) find that, although the assumptions underlying the child-centered versus society-centered distinction are crucial for understanding educational thought today and can illuminate some of the problems in evaluating both the

past and current movements in education, the distinction does not seem to contribute further insight into the complexity of current thought in curriculum. Significant educational dialogue today does not speak as clearly in these terms as it once did; the issues have shifted and become more refined; the child-society-discipline distinction has today lost the crystalline character it enjoyed in the past.

A crucial issue is that Tyler's rationale systematizes the traditional notions in the curriculum field. The four questions addressed by Tyler came to epitomize the traditional scope of the traditional school in curriculum development. The rationale embraces Taylor's model of scientific management which, as indicated earlier, was centered on technicalist and mechanistic efficiency, tight bureaucratic control, absolute rule-following, and a non-thinking worker who could be used as a *tool* by the management to maximize profit. Tyler's rationale embraces these assumptions of the business metaphor embedded in academic rationalism, whereby the curriculum developers, the *subject matter specialists* outside the school (ICD in our case) *install* in the classroom the curriculum from above. Besides this business specialism, Tyler actually bases the curriculum on disciplined knowledge. What Tyler is really saying is that by using the data from the two types of studies as selection criteria, schools must only select and organize instructional content from the knowledge funded by the discipline specialists in traditional academic subjects. This focus on the disciplines is probably why Johnson (1968) argued that, of the three "referents," only the disciplines could be considered as a source of curriculum items.

Tyler's rationale is also a linear model which separates *ends* from *means*, and also theory from practice. According to the rationale, objectives must always come first and other program components later. The ends are decided upon separately from the means thus overlooking "the interactional character between ends and means" (Aoki, 1974 p. 92). This preoccupation also leads to separation of "planned curriculum" and "curriculum as action." The former curriculum is viewed as the preserve of the curriculum subject specialists who plan it at the centralized ICD panels and boards or by some other agent elsewhere. The latter curriculum becomes mere *implementation process* of the package that has to be seen by the consumers as given and unproblematic. But even the curriculum developers at the ICD are also mere consumers because they also implement ends given to them and which they cannot question. The means they prescribe to schools may also not be of their making as they may be dictated by someone outside the country in various ways. In the final analysis neither the teacher and student nor the curriculum developer and educational administrator has the authority or power to make genuine and relevant decisions regarding curriculum matters. They are all consumers of someone else's products. Such is the dictatorship over the school systems.

One criticism made against Nyerere and his colleagues who initiated the policy of ESR relates to the separation of ends and means, and imposing both from the top to be merely implemented unproblematically. Although Nyerere advocated cooperative endeavor, collective leadership and peoples' participation in social action, the formulation of this policy did not involve educators and students. Its introduction to schools was seen by the majority of educators as a political rather than educational agenda which was preached in rush advance. Hence, not enough time was spent on analyzing its goals. As a result political platitudes and cliches took precedence. The policy, therefore, was dictated from above with a great deal of pressure and public drama that did not allow time for appropriate interpretation, debate and reflection. The whole process of its implementation was that described by Aoki (1983) as curriculum implementation as instrumental action.

Scope and Sequence of Geography Syllabus

It has been indicated above that Tyler's rationale requires that certain criteria have to be identified for selecting and sequencing content from academic disciplines. The analysis of geography syllabus for secondary schools reveals that several such criteria were used to determine its scope and sequence. Some of these criteria are discussed, and an attempt is made to explicate their underlying assumptions that may have influenced the development of an inquiring mind.

A Scaled Concentric Curriculum

The syllabus content bears evidence that its content was partly selected and sequenced on the assumption of a scaled concentric curriculum: that learners should cover places from "known to unknown" by beginning with areas of small scale to those of larger one. With a scaled, concentric program, instruction begins with content dealing with the small and most immediate area or locality in which pupils live and then proceeds to larger and more remote areas at district, regional, national, and world levels. As instruction proceeds over time, students cover larger and larger areas. Thus, starting with East Africa, the study of Regional Geography in the 1976 syllabus proceeds country by country and continent by continent. In fact an analysis of the past syllabi (Mbeo, 1975 pp. 375-396) shows that the scope and sequence of all geography syllabi that have been taught in Tanzanian secondary schools were established according to the concentric principle. As a result, geography was still viewed as an inventory type of study in which the emphasis is on the *horizontal ground coverage* of information, places, names, dates, discrete facts and figures in unrelated manner and thus resulting in what Gunn (1970) has termed *capes-and-bays* geographic education. The scaled concentric principle has the effect of encouraging too extensive breadth and too deep depth of the syllabus, resulting in too much content to be taught and learned.

Indeed all participants including pupils found geography and other syllabi to be too extensive and too deep. "Very long," "extra-long," "too ambitious," "content laden/saturated," "full curriculum," "loaded with too much detail and trivial facts" and "intended to cover everything a pupil needs in future" were among the expressions use by various participants to describe the syllabus. Most participants believed that this problem of scope has resulted into low cognitive achievement due to requiring students to go through a curriculum which imparted a sea of factual and abstract content and thus inducing rote teaching and learning. All teachers and pupils and most other participants agreed that it was impossible to complete the syllabus within the time allocated for geography - three forty-minute periods per week. In fact in most secondary schools, because of problems of timetabling due to the system of double session, geography periods had been reduced to two periods per week while the amount of content to be covered remained the same.

Too much ground coverage and depth made some of the content too abstract and difficult for teachers and pupils to understand. Topics which were cited by these participants ran across the whole syllabus. For example, in physical geography such topics included earth's structure and related processes such as weathering and volcanicity, oceanography, and some aspects of climatology. Complex content mentioned in regional geography included places which were too remote physically and mentally from pupils and teachers' experiences, and particularly those areas in North America, Western Europe and former USSR, and some parts of Asia. In fact some participants wondered why these places were being taught in such detail for so many years while pupils remained ignorant of their own environment. "Why do you like teaching the Rhinelands?" a pupil who had noticed this region recur in examination papers and tests over a long period of time asked

me. The most difficult topic was practical geography, and particularly surveying. In all schools teachers and pupils said surveying and such other difficult topics were usually not taught and, when they were, pupils were only given notes on them which they said were also hard to comprehend. As a result these notes were learned by rote memorization in order to pass examinations. Some teachers said that due to the length of the syllabus they had no alternative but to teach some topics superficially and even skip others, particularly those they did not understand or which were regarded as not likely to be examined by NECTA.

One assumption underlying the scaled concentric curriculum is that it has traditionally been based on the Piagetian notion of biological maturation. The scale of an area to be covered is determined by the physical age of the students rather than what a pupil is actually *able* to learn and do at that particular age. Thus, the younger the student the more immediate are the places covered; and, as they mature, students study those place more remote to their own environment. What matters, therefore, is not having learners investigate issues and problems related to their lives but ground coverage of places because such coverage meets the criteria of geography as an academic discipline. As a result, the scope and sequence of the syllabus is determined by what subject specialists accept as geographic knowledge by their own criteria, which leads to teaching the discipline for its own sake, not for the sake of the pupils.

Intrinsic in this notion of concentric curriculum is the progressive alienation and externalization of pupils and educators from inquiring into their genuine and relevant day-to-day needs and concerns and pressing problems that make meaning to their lives. As the scale extends outward from the immediate locality, learners get more and more alienated from issues and problems that are more crucial to their lives, and the masses of unrelated knowledge pupils are required to memorize become increasingly irrelevant and inapplicable to the resolution of those problems.

This alienation and externalization of pupil and teacher experiences was aggravated and entrenched by the requirement that the ground coverage be done according to the fixed conventional formula. This formula constitutes: *size, location, boundaries, relief, structure/physical features, weather and climate, natural vegetation/flora, animals/fauna, agriculture, industry, population and settlements, transportation and trade*. This formula has been used in all geography syllabi that have ever been taught in Tanzania. This long-standing tradition of capes and bays geography is still very active in Tanzanian secondary school classrooms. In the study of Africa, for instance, pupils had to repeat at least eight elements of this formula for each of over sixteen regions and countries that were to be covered. Thus, O-level pupils were required to repeat those elements about 128 times for the study of Africa alone. A-level students had to cover in detail about 40 countries, using about ten of these elements of the formula for each country, which amounts to 400 repetitions by the end of the study of Africa alone. With such an approach, teaching and learning become a boring drudgery in an uninteresting school life. Besides encouraging wholesale coverage of places and facts in discrete entities and bombarding learners and teachers with a flood of content beyond their capacities to cope with it, this traditional formula leads to unnecessary time-consuming duplication of content, wastage of resources, excessive boredom, and indeed agony. This traditional approach obviously overburdened pupils and teachers with details which were not systematized by meaningful issues, problems and concerns which mattered to them. The pressure to pass external national examinations drove pupils to cram thoughtlessly these masses of information. Those unfortunate pupils who were unable to memorize them and wanted to understand become failures of the system.

A Spiral Curriculum

Another reason for repetition of topics in the geography syllabus beyond that likely to facilitate meaningful teaching and learning seems to be an attempt to utilize the principle of *spiral curriculum* (Bruner, 1963; Taba, 1967, Welton and Mallan, 1992). Spiral organization of the curriculum means that the structure of instructional content should allow ideas to be used over and over again, and in progressively more complex form. "The concepts must be visualized as threads which appear over and over again in a spiral fashion but which always are moving to a higher level" (Taba, Durkin, Fraenkel and McNaughton, 1971, p. 20).

The secondary school syllabus bears evidence of the employment of this principle to sequence its content. In practical work, for example, the concept of *location* of positions began in Form 1 by locating positions in atlas maps using latitudes and longitudes. In Form 2 pupils were introduced to the use of place names, bearings and grid references, but repeated the use of latitudes and longitudes. In Form 3 pupils would repeat the use of bearings and grid references, and by Form 4 pupils were expected to apply the acquired skills to read and interpret maps and photographs, and to conduct simple chain surveying and leveling. Instruction was thus supposed to encourage repeated coverage of the concept of location, each repetition presumably at a greater depth of understanding.

Some repetition of content is of course normal in teaching, especially if it is intended to build on what the students already know by introducing new and different dimensions of the concept and by extending those ideas to new activities and contexts. Such repetition would be determined on the basis of the nature of the day-to-day classroom transactions by teachers and pupils. However, analysis of the content of the geography syllabus indicates excessive repetition of some topics. Africa, for example, is taught at great breadth and depth in Form 3, excluding East Africa. In Form 4 East Africa is taught also in detail with repetition of other parts of Africa in the study of world commodity production. A study of Africa in still greater detail is repeated at A-level. Several other topics are repeated in the syllabus. Teachers and pupils reacted to this repetitive nature of this syllabus which exacerbated the problem of scope by further extending breadth and depth beyond a manageable extent. Teachers tended to avoid repetition by teaching the topic once at a particular Form level. Some pupils said that sometimes teachers postponed teaching certain material at one Form level because it was going to be taught again at a later level. When pupils got to that later level other teachers assumed that pupils had been taught that material already and skipped it, and thus children ended up not being taught that content. This means that excessive repetition of content in the syllabus may have led to a diffusion of teacher accountability for teaching adequately certain content. Even when such content would be taught, teachers would teach it superficially at one level assuming that it was going to be taught again at a later stage. Again, the spiral principle essentially led to teaching geography for geography's sake, not pupils.

Piagetian Age Factor

The notions of concentric and spiral curricula are both rooted in Piagetian theory of developmental cognitive psychology. Bruner (1963), Taba (1967) and others who pioneered the discovery-learning paradigm were able to infuse this theory into discipline-centered, academic rationalistic curriculum in order to provide it with a psychological basis of how children learn. Both notions of concentric and spiral curriculum were invented to operationalize the Piagetian age theory of biological maturation that certain content could not be taught to a learner until he or she reached a certain stage of maturation. These notions also were successfully used along with ideas of the structures

of disciplines and hierarchical taxonomies of those fundamentals or "big" ideas which constituted those structures, and the notion of behavioral objectives. Tyler's rationale was adopted in one way or another as a model to guide curriculum process and ends-means evaluation of the program. Some of the shortcomings of Piaget's theory were reviewed in chapter two. The focus here is to illustrate that the secondary school geography syllabus bears evidence of the assumption of age-stage theory and "waiting;" actually the content of this syllabus is organized according to Form levels rather than issues and problems to investigate, which is itself a manifestation of this theory. It is assumed, for instance, that in the study of practical geography, pupils in Forms 1 and 2 cannot do simple chain surveying and leveling until they reach Form 3 and beyond. But, when I was teaching at Galanos Secondary School, Tanga, I tried chain and plane table surveying to Forms 1 and 2 students and they were able to use these instruments properly, produced excellent plans, and this helped them to do map reading and interpretation activities more easily and meaningfully.

Another evidence of the application of the "waiting" principle is provided by "case study" (topical) approach built into this syllabus. This method is planned to be used by Form 1 students in the study of climatic regions and is referred to as "sample study" at this level. In Form 2 it is directly referred to as "case studies" regarding the study of China's industry and communes. The rest of the syllabus for Forms 3 and 4 and Forms 5 and 6 bears no trace of this approach. By eliminating case studies at the upper levels, it is assumed that case studies are more suited to the younger students in lower Forms than to the more mature students in higher levels. Yet this approach to the study of geographic regions and other phenomena is one of those methods particularly suited to the investigation of particular issues and problems of a particular area and thus most appropriate to the development of an inquiring mind at all levels of schooling and in our everyday lives. Despite proposing the utilization of spiral curriculum, Bruner (1962, p. 143) warned that we may be controlling behavior by imposing irreversible limits upon the child with many of our practices in education in which teacher expectancy of certain levels of behavior makes it difficult for the child to perform the unexpected. Besides, this age-stage theory homogenizes pupils' abilities, an assumption typical of empiricist-positivist pedagogy which views pupils as objective biological masses.

The assumption of "objective disciplined knowledge" is partly illustrated by the existence of obsolete content in the syllabus. A case of the conditions necessary for the formation of a delta which were copied from a preacribed textbook has already been cited. Another example of obsolete content in this syllabus includes the study of "East African Community - the services performed by the community - while it died long ago. On the other hand, new African inter-regional organizations are not taught because they are not in the syllabus. Place names such as Manchuria, USSR, Eastern Germany, and Western Germany were still being used. In fact, those areas were being taught as if nothing had changed. Current changes that have occurred in Eastern and Western Europe, Africa, and elsewhere were non-issues in the classroom. The syllabus had remained unchanged since 1976, which means that it was unable to respond to the realities of the dynamic world in the day-to-day teaching and learning.

Teaching and learning the obsolete knowledge evident in the syllabus is mainly due to the nature of academic rationalistic curriculum. The assumption that disciplined knowledge consists of pure, durable, natural, standard, and universal objective truths causes those who install such a curriculum in schools to believe that the product can last for years without any modification. The business metaphor and top-down mode of decision-making preclude the possibility for teachers and pupils to critically reflect on program components and make changes as they teach and learn. An academic rationalistic syllabus is pressure-proof in that it is not sensitive to current pressures for

change. Consequently, issues which affect the preservation of humanity as a whole - international as well as local and national - are sadly underemphasized or completely excluded from the curriculum. Such issues as problems of peace, equity, democracy, environmental problems such as desertification, deforestation, erosion, pollution, and social issues such as drug abuse, aids, status of women and children, and the like as related to their contexts, are not the central focus of such disciplined syllabus. As a result, the teaching of this syllabus keeps children ignorant of the realities which could threaten their lives as adults. The syllabus is "teacher-proof" because teachers and their pupils cannot inject into it new objectives, authentic knowledge and processes. The assumption of academic rationalistic knowledge being pure and durable scientific truths means that the content of the syllabus is viewed as non-problematic.

Dichotomy Between Physical Geography and Human Geography

One obvious characteristic of Tanzania's secondary school geography syllabus is the emphasis on the traditional dichotomy between physical geography and human geography. Throughout the syllabus physical geography is treated as a separate study at both O-level and A-level. This traditional *dualism* in this discipline is an indication that *"environmental determinism"* - the view that stresses the overriding influence in human life and activity of the physical environment (Murphy, 1973, pp. 56-59) - still re-echoes in the secondary school syllabus. This view is related to behaviorism. To the environmental determinists, geography means a study of how nature *conditions* and *determines* human behavior and activity. In light of this view, William Morris Davis (Broek, 1965) writes:

> In its physical part geography examines all natural features of the earth's surface; in its human part geography considers the effect of these natural features on man and his activities (p. 19).

In this conception, physical geography studies the earth's surface as an objective phenomenon that can be explained and predicted correctly and observations applied universally, and human geography investigates how physical factors influence and determine man's destiny. The relationship between physical attributes of the physical world and humans are seen as *linear* rather than *transactional* in nature. A separate treatment of physical geography in the syllabus suggests the persistence of this convention of dividing the discipline into two superficially distinct geographies. This distinction is another factor that encourages teachers to teach and pupils to learn geography for geography's sake.

Indeed, traditionally, the physical aspect has been the major defining factor of the nature of geography. The discipline has been viewed by geographers from ancient times as the study of differences which exist from place to place on the earth's surface and accordingly, based their studies on a *chorological* concept. The chorological concept, the "scientific" study of places, has historically and traditionally been the central theme in geography. From this viewpoint, geography has traditionally had defensible position among the natural sciences. As a result, geography is one of the disciplines which have been dominated by empiricist-positivist-rationalist research and pedagogy, and a curriculum orientation called by Aoki (1979) as empirical-analytic.

Environmental determinism is of course an obsolete theory. As Murphy (1973, p. 59) points out, "determinism" as an approach has been replaced by *possibilism*, which assumes that humans have a large degree of choice to act and change the environment even though the environment may set certain temporary limits on what we can profitably do. It seems then that Aoki's (1979) suggestion of *critical* curriculum orientation in which *man/world* relationships are viewed as *man-in-his-world, with his world* and

transactional-transformational-reflective in nature, is more appropriate to the instructional ethos and climate which focus on the development of an inquiring mind.

Comprehensiveness

Some participants found the geography syllabus lacking comprehensiveness. Comprehensiveness means that curriculum content should include all types of learnings, including knowledge, skills, values, and attitudes or dispositions. The syllabus emphasized the learning of discrete factual and theoretical knowledge as found in the established discipline. If the syllabus had intended to develop an inquiring mind it would have emphasized processes, skills, and dispositions.

The above selection and sequencing criteria are largely the *inner* disciplinary ones based primarily on the nature of the discipline itself and related psychological paradigms. Some selection criteria that seem to apply to this syllabus emanate from economic and political interests and points of view. They are these criteria we now turn to.

DIFFUSION OF INNOVATIONS FOR MODERNIZATION

The 1973 and 1976 syllabi both reveal that their content was partly selected on the basis of the belief that the school curriculum can become a vehicle to *transfer* innovations for development and modernization from more developed countries and economies to Tanzania, a less-developed country, through a process of *diffusion of innovations*. As a result of this assumption, the syllabus includes the study of economic activities of North America, and particularly USA, Western Europe, former USSR, China, the Middle East and the Indian Sub-Continent. The study of these areas has consequently been labeled the "study of development" in the syllabus and in some textbooks used in schools for this purpose. The belief seems to be that if about half of the syllabus' content to be covered is about "knowing about" the economic activities performed in the more economically developed countries and economies, students will automatically be able to learn adoptable innovations from these countries. The assumption of *transfer* of modernization - science and technology, to be exact - must have exacerbated the problem of providing irrelevant education that alienates teachers and learners from the mainstream of their economic, political, and social development.

One possible reason for prevalence of this belief might have been the urge to operationalize the *need to learn from what others do* as stated in the policy of ERS. It might have been hoped that knowing much about industrialization and mechanization of agriculture in those countries would produce secondary school graduates most likely to transform Tanzania's economy into a modernized one.

The policy of ESR, having been formulated in 1967, could hardly have escaped falling into the trap of the dominant *human capital* economic paradigm of development that then pervaded the thinking of economic and educational intellectuals and policy makers (Mukyanuzi, 1990). Mlekwa (1989, p 5) finds that, up to the 1960s, development was conceptualized purely in terms of economic growth and measured statistically by increases in the country's GNP. Those were the days when the modernization theorists were arguing that rural areas would benefit from the spill-over effects of development taking place in the urban centers of the developing countries themselves and also in the industrialized western countries. The literature on development was dominated by the functionalist school of thought regarding the process of change: that it is evolutionary, starting with an innovation in one institution or subsystem to spread throughout the system by a process of diffusion and "multiple feedback loops." Developing countries were poor because there was something wrong with their traditional economic and political institutions or at least their traditional values. What was needed, they argued,

was a "process of modernization, stimulated by the diffusion of western technology, capital and socialization, embodied in a dynamic modern sector in each Third World nation [whereby] the dysfunctional institutions and values would be replaced by modern ones" (Unsicker, 1987 p. 42). Consequently, in education courses in Tanzania's teacher education institutions, The Diffusion of Innovation, by Everst Rogers (1962) and similar works became among the major readings on the reference lists (Ministry of Education, 1980).

But these assumptions about development were not supported either by reason or by any historical evidence. The modernization theorists overlooked one important fact. Different social classes tend to have not only different but fundamentally antagonistic interests which are constantly competing for the limited resources available in the world. Consequently, while there was an increase in economic growth, there was at the same time an increase in poverty and underdevelopment - the poor became even more marginalized and tied more tightly in the debt trap. The implication was that if development was to be meaningful it had to embrace all the aspects of life of the community - social, political, and cultural. In that broader context, issues such as self-reliance, equity, and increased participation of the populace in the society now came to preoccupy the minds of development theorists and practitioners. Although this latter thinking forms the substance of the Arusha Declaration (AD) and ESR policy, evidence from secondary school geography syllabus and the way it is taught suggest that curriculum development and implementation in Tanzania are still largely nutshelled in the old, archaic assumptions about development through education by using school curriculum. Indeed, the human capital medicine has all along been prescribed and even sometimes forced down our throats by some donors as the best cure of our economic ills. However, this paradigm along with its diffusion principle embraces all the assumptions of the business metaphor; it is a top-down approach to decision-making and empiricist-positivist-rationalist in nature. It is totally antithetical to the development of an inquiring mind and a humane society of thoughtful, free, democratic people.

Of course there is nothing wrong with learning from what others do, but appropriate criteria have to be applied so that relevant content and experiences are selected willingly and consciously. However, even if we are to select the most appropriate learnings from developed countries and economies, students and the populace in general will not benefit from such knowledge if they will simply be required to "consume" it blindly without reflecting upon it and making their genuine decisions to utilize it. Lessons from the First Five Year Development Plan, for example, made it clear that Tanzania cannot develop by wholesale borrowing of ideas from outside. One aspect of this plan which proved to be mistaken was the emphasis on the "transformation approach" - the opening of Government-financed new settlement schemes of a highly mechanized nature. This approach was too expensive and mistaken in its estimates of economic and psychological results (Nyerere, 1969). Having pupils "hear about" similar schemes undertaken in the developed world or elsewhere through teaching capes and bays geography syllabus and regurgitating that information during examinations is a waste of pupils' and teachers' time and society's resources. This approach is unlikely to promote the development of an inquiring mind in Tanzania's educational institutions.

COMPLETE AND TERMINAL EDUCATION

Some participants believed that the scope of the syllabus was partly influenced by the ESR's goal of *complete* and *terminal* education. It was stated in the ESR policy that since the majority of primary and secondary school pupils had to go and serve the community upon graduation as it was impossible for the government to provide them further education at the next levels, education had to be terminal and complete in itself

(Nyerere, 1968). As a consequence, curriculum development effort was directed at designing "full" syllabi that were overcrowded with content in order to make them complete. The assumption seems to be that students had to learn everything they needed to know in life while they were at school, and that the youth would transfer that knowledge to workplaces and other situations upon completion of their schooling. This erroneous interpretation of the policy led to mere amputation of content into the syllabus, making it amorphous and impossible to teach within allotted time. However, the ESR policy, if properly understood, calls for process- and disposition-based curricula.

This misinterpretation of the policy seems to be one reason for school timetables to have been overcrowded with very many subjects to be learned in a short time. This problem in turn reduced practically the time allocated for each subject and put much pressure on schools to rush through the curriculum and perfunctorily in order to prepare pupils for national examinations. At O-level the number of compulsory subjects was eleven (40 to 44 periods per week) in Forms 1 and 2, and nine (40 to 45 periods per week) for Forms 3 and 4. The number of periods per week varied depending on the bias subject taken, which included agriculture, commerce, home economics and technical subjects. On top of this, a student could take an optional subject (3 to 4 periods per week). The timetable also included ten hours (15 periods) of self-reliance projects and two hours (3 periods) of sports and games per week (Ministry of Education, 1984a pp. 34-38). Thus, the scope of the content of the school programs was not only extensive in terms of the content within a single subject but also with respect to the number of subjects taught. All the participants complained about both the length of the syllabi and the number of subjects taught. They said that besides the syllabi being too long and lacking a focus on the development of an inquiring mind, the timetables were so packed with subjects that neither the teacher nor the pupil had time to rest, or to do adequate preparation and self-study, or to reflect thoughtfully on the content they taught and learned. The day was so rigidly structured and full of mechanistic tasks such as excessive teacher talk, giving and copying notes, memorizing and regurgitating discrete information, and other such activities that schooling became a dull and uninspiring experience.

Lecturing which was the most common teaching method, may thus have partly been the consequence of the conventional, non-flexible, overloaded timetables which left no room for teachers and pupils to think critically, innovate and improvise. The situation was exacerbated by the fact that these rigid timetables were being prescribed by MOEC along with the syllabi. The schools were mere implementers of the installed curricula and timetables, both of which were required to be followed to the letter by the inspectors and school administration. With such highly programmed, fixed timetables from above which negated the reasonability and feelings of teachers and pupils, it was impossible for practitioners to cope with the demands of a teaching and learning climate that would constitute conditions likely to develop an inquiring mind. Such a climate requires flexibility and freedom to adopt and adapt, to create and reflect, and to take the advantages of the unplanned, serendipitous, and exciting moments.

To summarize this section, the analysis of the geography syllabus which was in use at the time of field work shows that the syllabus rooted in academic rationalism and its concomitants. The rationales and criteria used to select and sequence content resulted in a program which was essentially irrelevant and antithetical to the development of an inquiring mind. Besides the syllabus being installed from above and treated as unproblematic, it did not address issues and problems that were crucial to the learner's context and those of society. The syllabus induced preoccupation with the horizontal and vertical coverage of a mass of disciplined knowledge in accordance with the traditional formula and dictates of subject specialists. As a result, geography was taught for

geography's sake, a process which alienated and externalized pupils' and teachers' experiences from the mainstreams of their genuine concerns and national issues. Such positivistic and rationalistic syllabus can hardly promote the development of an inquiring mind.

The discussion that follows focuses on some activities which were crucial to the development of an inquiring mind. These activities include practical teaching and learning related to the subjects, self-reliance activities, and vocational experiences.

PRACTICAL TEACHING AND LEARNING

Academic rationalism must have been an obstacle to the reaching of the vocational goal of education for self-reliance of preparing the "young people for the work they will be called upon to do in the society" (Nyerere, 1968, p. 274). According to this paradigm, practical learning is assumed to be incompatible with the goal of the academic rationalists who believe that "to construct a curriculum that includes practical learning such as vocational education *dilutes* the quality of education and *robs* students of the opportunity to study those subjects that reflect man's enduring quest for meaning" (Eisner and Vallance, 1974 p. 12). As a result, academic rationalism advocates the detachment of theory from practice in favor of theoretical teaching and learning of pure, solid "content" that is believed to be "intellectually rigorous and difficult and that, by its very nature, is presumed to make the necessary strenuous intellectual demands upon students" (Eisner and Vallance, 1974 p. 14).

The geography syllabus for secondary schools separates theory from practice. For example, it is evident from it that practical geography is not continuously built into the entire duration of the course. Instead it is listed as a separate topic for each Form level to be taught and discontinued. This kind of organization affected directly the sequence teachers used to teach this topic. Having been taught and "finished" as a theme, practical geography was unintegrated within the entire course of study and did not help learners to act continuously upon their "immediate environment." In fact, as a topic in itself, practical geography was being taught theoretically. Since it was being discontinued after covering it, even practical skills acquired through occasional practicals were soon being forgotten because they were not being reused and, hence, reinforced. This problem was aggravated by the use of textbooks produced by ICD in that they, too, treated practical geography as a separate topic at each Form level and it came at the end of a textbook as a last topic. The expository-theoretical approach used to present concepts and processes of practical geography in these books encouraged lecturing, memorization, and regurgitation of information.

Reacting to practical geography, both teachers and pupils said that practical activities were not being done and that those sections of practical geography that were being covered were being taught by lecturing and copy-copy methods *in* the classroom. "Practicals in all practical-oriented subjects have died out gradually, despite the fact that it is such activities that are essential to the bridging of the gap between theory and practice and development of an inquiring mind," one headmaster commented. Activities that required *field work* and manipulation of equipment and instruments were hardly being done. Very absurd was the situation of weather stations; in all the secondary schools visited and indeed Dar-es-Salaam teachers college, there was virtually no single station that was in use. The Stevenson's Screens had been dismantled and some of their remains and equipment were stored in the geography rooms, staff rooms or in school stores because, teachers said, the stations had been vandalized, particularly when the economic situation was very bad.

During the early 1970s the then Institute of Education had written two pamphlets about field studies, one called Field Work in Geography and the other one called School Weather Station. The former was a handbook about how to conduct field work in geography; the latter about how to establish a school weather station, record and process weather data, and interpret and display this data. These were very useful resources and aided the development of students' and teachers' abilities to inquire. Unfortunately, both pamphlets were no longer either in schools or in teachers colleges. Teachers and tutors said they had no idea about those resources, and the ICD had not reproduced them, let alone writing new ones. Actually these pamphlets were not even in the ICD's library.

Other reasons given for absence of practical activities included lack of essential equipment and instruments - the problem which in turn was attributed to lack of funds to buy them; lack of space - in almost all schools geography rooms and even some laboratories had been turned into normal classrooms due to increased enrollments; lack of time due to big workloads also caused by large classrooms and too many subjects to teach; rigid timetables; and lack of teachers' resourcefulness and/or motivation to improvise and use the immediate community's resources - for instance, schools were hardly using airport meteorological stations, surveyors and their equipment from the survey departments, and guest speakers. Another reason given for lack of practical activities in schools was that school-based and national tests and examinations tested theory rather than practical work allegedly because schools had no equipment and space to conduct them. When practicals were examined, they only included "simulated" practical activities involving only answering bounded, remembering questions. Consequently, actual practicals were seen by teachers and pupils as a waste of time because they were redundant.

In some schools the school administration was cited as an impediment to practical experiences, particularly field experiences, as some heads of schools regarded them as a disruption of day-to-day school routine and timetable, and thus such activities were seen as a burden on top of their normal administrative work. "Heads of schools prefer stability and orderliness rather than disruptive arrangements," a teacher observed. Teacher education was another factor also cited by teachers and tutors themselves: teachers' educational backgrounds, like those of their pupils, lacked prerequisite knowledge and skills in practical geography right from school through teacher education programs. As a result, teachers were handicapped from performing practical activities throughout their educational experience. This problem was exacerbated by hurriedly offered *crash* teacher education programs that have for a long time eroded the quality of teachers, student teachers and teacher educators in a notorious vicious circle.

In all schools except one, teachers, most of whom were diploma holders, did not know what the geography equipment and instruments which were available were called, let alone how they could be used. Some of the equipment which teachers could not name but was in the schools included a stereoscope, a chain, a plane table, a prismatic compass, ranging poles, a theodolite, a wind vane, maximum and minimum thermometers, an hygrometer and a barometer. As a result, available resources which were in good condition or could be repaired or used with a minimum of improvisation were actually not utilized. Unused equipment also included wall maps, topographical maps, aerial photographs, globes and samples of rocks and rock forming minerals. In one school where teachers reported a *serious* shortage of such instructional materials, I was surprised to find that most of them were locked in the school store when the store keeper proudly let me go and see what was available. I really could not understand why the school complained about shortage of such materials while they were securely locked in that room.

In another equipment-rich school situated in Dar-es-Salaam, which had almost every facility needed to conduct practical geography, a teacher said: "Non-availability of resources is not an issue here although it is a common song. The problem is that we don't know how to use them. And this is because we have never used them. We were not taught how to use them *practically* either at school or at college." In another school the rain gauge was being used as a flower pot! Indeed, Jengo's (1972) observation that "educational media were used haphazardly" (p. 136) was still prevalent and the situation was probably worsening.

It should be noted, however, that despite the lack of practical experiences being attributed to several reasons cited above, the major one seems to be the pervasive ethos of theoretical teaching and learning enshrined in the philosophy of academic rationalism and related paradigms. The absence of practical experiences in schools and teacher education institutions is thus not merely a question of lack of funds and other resources, teachers' prerequisite capabilities to conduct practicals, maladministration of schools and the like *per se*, but a philosophical issue which is manifested by these other problems.

SELF-RELIANCE ACTIVITIES

From 1967 all schools were required to conduct self-reliance activities, which since then were included in the school timetable as "self-reliance projects" taking ten hours per week in secondary schools. (In primary schools they took one hour for standards 1-2; two hours for standards 3-4; and three hours for standards 5-7) (Ministry of Education, 1984a pp. 34-40). These activities were intended to serve two purposes, one academic and the other economic. Academically, self-reliance activities were intended to serve the politico-ideological and pedagogical intents, as they were supposed to become an integral part of classroom experiences, to act as "laboratories" for students and teachers to integrate theory with practice, and thus cultivate a praxis-based learning climate, to facilitate school-community integration, to aid in the inculcation of desired values and attitudes, and to provide alternative sources of instructional content. Economically, self-reliance activities were intended to engage students in economic and other activities that would enable them to contribute to the upkeep of the schools and thus to cover part of the running costs. To this end the government required that each school meet 25 percent of its upkeep costs. Of course this economic aspect also had an academic component since, according to ESR policy, students were required to "earn as they learned and to learn as they earned." The activities were intended to provide a real-world practical context for students to practice the elements of an inquiring mind and enable them to acquire some vocational skills as they learned the traditional disciplines and thus minimize the effects of academic rationalism of the grammar school model.

All participants were asked to respond to the intents, types, and magnitude of the self-reliance activities which were being conducted in schools and the problems that were faced in initiating and running them. Two types of projects were found in the schools, the school *shop* and the school *farm*. The former was the most common activity, particularly in the urban areas, while the latter was found in rural-urban schools. However, in both cases the magnitude of the projects was very small. In fact, in most schools, shops sold cold drinks only. The school farms consisted of very small plots growing some vegetables and fruit-trees, and in some schools those small *shambas* were full of weeds and poorly attended. In all schools that had shops, this project was run by non-teaching staff members appointed by the heads of schools. Regarding agricultural activities pupils contributed manual labor in the production process, but they were not involved in other important matters such as deciding what to grow, how to grow it, selling of the products and management of the funds accrued from the sales of those products. These decisions were mainly made by the heads of schools with their teaching and non-teaching staff. In

one school teacher participants complained that, in fact they had not been involved in such matters. In some schools self-reliance committees included pupils as well; but, those committees, according to teachers and pupils' responses, had no real power to decide anything or take action. The MOEC's guidelines on how to initiate and run self-reliant projects were in all schools hardly followed by the school administration. These activities were primarily intended to provide students the opportunity to develop their abilities to inquire, but hardly involved them; and, if they did, students did not engage in decision-making, planning or other key inquiry processes. In fact, in some schools, particularly those in Dar-es-Salaam city, pupils had difficulty identifying the projects which were being undertaken in their schools and tended to believe that the shop was not their property. In over half the schools pupils said that they had not been involved in any project in any way, and in all schools none of the pupil participants had been involved in the school shop project.

One factor that tended to diminish the value and significance of these projects in schools was that, unlike the academic disciplines, they were not part of the examinable curriculum. Like practical geography activities, they were seen as a waste of time and energy. Teachers and pupils were not motivated to take them seriously. For both teachers and pupils the overpowering priority was to finish as much as possible the content-laden syllabus and to prepare for national examinations. Besides, teachers gained no kudos for being conscientious in self-reliance activities, and their teacher education did not prepare them to supervise these activities or link them to the classroom instruction which departed from talk-and-chalk or copy-copy methods of teaching. Indeed, like their pupils, teachers expressed lack of interest in these activities. Some teachers blamed the MOEC policy makers for assuming that every teacher was competent to supervise the projects effectively without any education in how to do so, and that every teacher was interested in supervising them. Teachers admitted having neither the knowledge nor skills to provide useful guidance in this regard.

The overstressing of the production aspect of the self-reliance activities has led to teachers, pupils, and some educational administrators equating the policy of ERS with the economic aspect of schools contributing to their upkeep and cutting costs. When asked to say what they thought ESR was about, all teacher and pupil interviewees and some officials held a narrow view that education for self-reliance only concerned an outdoor aspect; that is, self-reliance projects were held after the classroom work and only aimed at "education for material self-sufficiency" without any applicability to the classroom instruction. This misinterpretation of the policy could also be noted in the MOEC's annual reports (Ministry of Education, 1988; Ministry of Education and Culture, 1989) and other documents on ESR policy. Research has also tended to concentrate on the economic aspect, ignoring the academic dimension. As result, self-reliance activities have remained unintegrated with academic work. Rather than being integrated into the curriculum, self-reliance activities were tagged on as non-examinable, afternoon *chores* which often served to reinforce students' distaste for manual labor.

Worse still, in all schools, teachers and pupils said that self-reliance activities, particularly those involving physical labor, were used as punishment - particularly agricultural activities. That manual work was still the main form of punishment meted out to pupils did not help the dignity of labor and may have helped to entrench academic rationalism.

Some teachers, pupils, and officials felt that self-reliance projects were being exploited by some heads of schools and principals in teachers colleges as a means to serve their personal, vested interests, particularly as a vehicle to impress senior officials and politicians and gain favors and fame so that they could get promoted to high offices.

Consequently, self-reliance activities in such schools and teachers colleges were often extended to a degree that impaired regular teaching. This opportunistic behavior also contributed to the dislike of these activities by students and concerned teachers as it led to the actual loss of the allotted instructional time. In terms of covering running costs, none of the schools visited had ever met the 25 percent target. There is also evidence to show that other schools had not met it (ILO/JASPA, 1982; Almasi, 1985). There might be schools elsewhere in Tanzania which had met the target and even exceeded it, but not a single school had been reported for having succeeded to use these activities to promote an inquiring mind. Again, this failure can be attributed mainly to the influence of academic rationalism. The contradiction seems to be that, while self-reliance activities were intended to be based on praxis approaches to teaching and learning, disciplines which were more highly valued obstructed any attempt to close the gap between theory and practice and view these activities as a legitimate part of normal instruction.

VOCATIONAL PROGRAMS

Since 1972, Tanzania followed a policy of diversifying and vocationalization of secondary education. Each O-level secondary school was required to teach at least one of the four vocational subjects, also called *biases*. They include commercial, technical, agricultural and home economics biases. In fact all secondary schools were classified according to these biases. The vocational programs in secondary school education aimed at (Ministry of Education, 1984a, p. 4):

(1) Putting emphasis on manual work that ties in with economic and social development of the country.

(2) Preparing students for work in the villages and towns.

(3) Making students love and appreciate the importance of manual labor.

(4) Marrying theory and practice.

Like self-reliance projects, the vocational programs were intended to serve economic, pedagogical, and ideological goals. The programs were to equip students with some scientific and technological knowledge and skills. Ideologically, vocational programs also aimed at inculcating positive attitudes and values or dispositions towards manual labor and vocational activities and thus redress the shortcomings of the grammar school education which was inherited from the British colonial regime, an education which revered academic rationalism or, according to Goodson (1983) "academic tradition" (p.26). In articulating this measure, Migembe (Institute of Education, 1978) says:

> Tanzania inherited the "grammar school" tradition in secondary education. The best brains were given "pure" education in grammar secondary schools while the less successful candidates were sent to trade schools that were at first regarded inferior to the former. Recently the grammar schools have all been replaced by vocational biased ones (p. 36).

Vocational programs have been subjected to trenchant criticism by various critics. In the World Bank financed study, Psacharopoulos and Loxley (1984) reported that "in all cases, the gains in vocational learning are obtained at the expense of English language achievement" (p. 20). Moreover, in the agricultural bias gains in cognitive achievement were the least consequential proving that "the agricultural biased schools are the least

cost-effective" (pp. 20-21). Cooksey (1986) believes vocational programs added extra work load onto the already content-laden syllabus, and as a result they "may have contributed to the declining standards of general secondary education. ... What is needed, therefore, is a crash course remedial studies [in English language], not the introduction of extra subjects" (pp. 194-195). Psacharopoulos (1984) claimed that employment prospects for vocational and non-vocational graduates were the same. These and other negative evaluations which *proved* the vocational programs to be a *failure* and recommended their termination in favor of traditional academic programs, prompted the World Bank to stop supporting the vocational education in Tanzanian secondary schools.

Actually the World Bank has been a leading critic in opposing the offering of vocational programs in Tanzznian educational system. In its 1990 report (World Bank, 1990), the Bank claimed that 30 percent of class time devoted to study the four vocational subjects in Forms 3-4 (it was 22 % in Forms 1-2) was a waste of time because these subjects were "regarded by employers as only marginally relevant, and rarely leading directly to self-employment" (p. 7). The World Bank (1990) believed that the biases were also taught

> to the detriment of more *generic skills*. It could be argued that the inclusion of such *practical* subjects would improve the curriculum, but recent World Bank/UNESCO research concludes that less specialized curricula concentrating on generic skills and requiring less costly equipment result in students better prepared for adult life. Such students are more likely to find jobs and, because of their broader training, more able to change jobs successfully and to learn the new skills required for new tasks that they may be asked to perform. Most students with less specialized backgrounds are better prepared to meet the requirements of higher education courses (p.11).

A third reason for the Bank's rejection of a vocational program is that "there are high costs of providing workshops, specialized teachers, and consumable materials for the vocational courses" (p. 5). "Efficiency in the use of resources would be greatly improved if the secondary school curriculum were modified to include only those subjects that can be realistically taught in schools" (p. 15) - that is, academic disciplines only.

The World Bank (1990) does not intend to spare vocational programs even at the post-primary and adult education levels. In suggesting how the unit-cost could be reduced in the education sector, the Bank claims that this would be done "by abolishing selected non-viable programs, such as the post-primary *technical* colleges and some of the *vocational* programs conducted by the Folk Development Colleges" (p. 23). Such is an advice to a country where over 90 percent of the population was rural depending on agriculture, and in which not more than 12 percent of the primary school leavers got promoted to Form 1 and much less so of Form 4 leavers to Form 5 and higher education.

As it can be seen from this discussion, the critique of the vocational programs has focused only on one goal of these programs - the preparation of students for work - and the evaluations have basically rooted into the assumptions of *human capital theory* - the view that there is *direct* relationship between education and the economy (Smyth, 1992 p. 279) or, more specifically, that investment in education pays because there is an economically rational relationship between the level of education and level of income (Bacchus, 1990, p. 288). The supporters of the human capital view argue that the vocational programs should be scrapped because the graduates of these programs cannot be employed in the jobs or be self-employed in the economic activities related *directly* to

the biases they studied at school. Since there is no one-to-one relationship between the school program and employability of its graduates, it is cost ineffective, inefficient, and a waste of resources.

The views of most participants on vocational programs, particularly teachers and pupils were different from this human capital school of thought. Some participants found that a mismatch between schooling and employability was inevitable and indeed expected because not all students taking, for example, agriculture, could be absorbed into jobs of agricultural nature since the opportunities to be employed in such jobs were fewer than the number of the graduates of that bias. Other students with different bias backgrounds were promoted to Form 5, went to other courses or were self-employed in businesses which were or were not related to their vocational education, just as was the case with academic specializations. Not all students who specialized in science subjects became scientists or technicians. Participants felt that the argument of perfect fit between schooling and employment was redundant. Others believed that, when the unmarketability of graduates of vocational programs was taken at face value might imply cost ineffective programs; but, taken at a different level considering total advantages of the programs, those students with few, rudimentary vocational skills and knowledge were better off than those with none.

The evaluations of the critics were incomprehensive. They did not take into account all goals of the vocational programs and thus were narrowly focused in their assessment. The evaluations also looked at short-term rather than long-term, lifelong benefits of these programs. Appropriate assessment needed longitudinal studies which would trace the graduates of these programs for a much longer period of time. It was encouraging, though, to find that all pupil and teacher participants supported the vocational programs and wanted them to continue. These participants believed that, indeed, the programs faced a number of problems, but that this was not enough reason to abandon them because those problems could be solved. But some participants, particularly some administrators, supported the findings of the World Bank/Unesco studies and wanted to see schools teach only disciplines of knowledge or generic skills.

The advocacy of teaching only generic skills is of course an academic rationalistic and positivistic position which claims that generic programs consisting of universal and transferable scientific, durable basic or fundamental concepts and ideas with wider applicability across teaching and learning and working contexts, were more appropriate to the training of the mind. Beneath this claim is the belief that vocational programs are for dull, unintelligent students. This same assumption has worked to fail practical and self-reliance activities in secondary schools. The three types of activities have also been undertaken without any attempt to integrate them and have them support one another. The school shop is not used for teaching commerce or a school farm for teaching agriculture. Vocational subjects have tended to be taught just like academic disciplines - through lecturing and theorization. Yet, if these programs were well-designed with the intent to promote an inquiring mind, they would be one of the greatest opportunities *all* pupils would encounter in their school experiences.

Historical Background of Vocational Programs: A Hierarchy of Status of School Subjects

The resistance against and rejection of vocational and practical-oriented programs is historical, and has much to do with the legacy of British colonial, academic rationalistic, aristocratic education of the grammar school. Goodson (1983) observes that this problem is related to the emergence in Britain of a hierarchy of high-status "examination subjects" of the academic tradition which constituted "examinable

knowledge" at 'O' and 'A' level examinations. It was then assumed that "able pupils" were those who could pass these examinations. It was taken for granted that these examinations covered *academic* content and were aimed at able students who did not study technical and vocational curricula. The third tradition, besides the academic rationalistic and vocational ones, was the social studies one which followed the progressive or probably the discovery learning view of pedagogy.

Goodson found that these three traditions can be related to the social class origins and occupational destinations of their pupils as revealed by the historical background of the English curriculum. "Hence the curricula of public and grammar schools aimed at middle- and upper-class children preparing for professional life were primarily academic, whilst [the others] stressed utilitarian training" (p. 28). Thus, grammar-school education was developed mainly as an upper middle-class phenomenon - the education of the aristocracy - while practical-oriented vocational education aimed at the lower classes of the toiling masses (Hargreaves, 1982; Goodson, 1983). According to Goodson, the definition of public and grammar school subjects in the nineteenth century which was established in the 1904 regulations and confirmed in the school certificate examinations clearly followed the aims of education as a preparation for professional and academic life.

> A new and important feature of the time that was to prevail, was the redefinition of high-status knowledge as that which was not immediately useful in vocation or occupation. Hence the study of Classics now came to be seen as essentially a training of the mind and the fact that a boy could be spared from work long enough to experience this in full measure was in itself seen as a demonstration not only of the high status of the knowledge itself but also of the recipient - the mark of a *gentleman* rather than a *worker* (pp. 28-29).

Goodson found that neither the commercial nor technical education was ever seriously considered as a new dimension of comparable status to be added to the existing classical curriculum and that its confinement to low-status areas of the curriculum has remained a constant feature of English curriculum conflict, with emphasis on abstract knowledge with a consequent separation from practical world of work. He also found that the narrow view of vocational programs was still powerful, as was shown by the constant pressure for utilitarian subjects in spite of their recurrent failure to earn high status (Goodson, 1983 p. 29).

Goodson (1983) also found that the low status of vocational programs was also shared by the Social Studies tradition; it "has often suffered from the comparatively low status also accorded to the utilitarian tradition" (p. 31). Hargreaves (1982) documents on the low-status accorded to theater and fine arts and other aesthetic subjects.

From this historical background it can be seen clearly why practical-vocational programs intended to redress the problems emanating from inherited British academic rationalism of the grammar aristocratic education have met resistance in Tanzania, both tacit and overt, direct and indirect, local and foreign. The reason is that the grammar school tradition remains embedded within Tanzanian educational system, which is itself a replica and product of British educational system. This colonial legacy continues to reproduce itself and entrench this tradition to the point that it is now taken for granted and unproblematic. The basic frame of reference of the majority, if not all, of powerful educational policy makers and day-to-day decision-makers is basically premised on this tradition. Consequently, their active decisions and the means they employ to develop education are themselves totally opposed to the development of an inquiring mind. This is one of the most serious contradictions in Tanzanian educational system. The problem

of the reproduction process of colonial legacy in former British colonies is well-documented by Bacchus (1990).

Evidence of strong belief in the hierarchy of the status of subjects and academic rationalism was provided by one high-ranking official participant from the Department of Secondary Education at the MOEC headquarters. While reacting to MOEC's position on adopting an integrated, interdisciplinary approach to curriculum organization this official said:

> But of course people are talking in terms of integrated subjects like teaching integrated science, teaching social studies and things like that. But they haven't come up with really something to develop a policy as such. But we tend to believe that if we are to develop really we should teach each subject separately ... because integrated curriculum tends to *water down* the subject. It doesn't encourage students to think rigorously. It is good to teach individual disciplines to academically able students so as to give them a room to study an in-depth of the subject rather than touch it on the surface. The integrated approach doesn't arm a student with some knowledge that he can take further to higher learning institutions as such.

Other officials who disagreed with the introduction of social studies said, besides consisting of "elementary" knowledge, they were in fact a "conglomerate" of social sciences. They saw the term as a collection of separate but somewhat watered down disciplines. The ministry of education has, however, decided to introduce *social studies and integrated science* in secondary schools (Ministry of Education and Culture, 1992), but it seems that these curricula will take a lower status to the discipline-based ones which, according to the grammar school tradition, will be for "able" students.

DEVELOPMENT OF PROJECTS INTENDED TO DEVELOP AN INQUIRING MIND

To find out whether or not deliberate efforts had been made to develop curricula projects intended to develop an inquiring mind in schools, educator and administrator participants were asked to respond to the question: *Do you know any project(s) which has/have been designed solely for the promotion or development of an inquiring mind in our secondary schools?* Furthermore, teachers were asked to describe both (1) the projects in which they had been involved in intended to help them understand the concept of an inquiring mind and how to develop it and, (2) an innovative teaching project they themselves had initiated and accomplished.

All participants who responded to the first question said that they had not come across a project or program initiated in Tanzania intended solely to foster the goal of developing an inquiring mind, that is a program or project which attempted to define it or offer some material to read about various conceptualizations and alternative ways and means of fostering this goal. They said that this kind of effort was absolutely lacking in Tanzanian educational system.

Some participants, particularly officials from the MOEC's headquarters, cited a number of "imported" mathematics and science projects which came to Tanzania as part of the discovery-learning movement of the 1960s from USA and Britain. The transfer and adoption of these projects was only limited to these subjects and never touched social sciences including geography. The projects included the East African Entebbe Mathematics Program (EAEMP) which was modeled greatly on the American School Mathematics Study Group (SMSG) project. The other project in mathematics was the School Mathematics Project for East Africa (SMPEA) which later changed its name to

School Mathematics of East Africa (SMEA) and was influenced by the British School Mathematics Project (SMP).

In the field of physical sciences, the projects cited as having been introduced from Britain and USA respectively were School Science Project (SSP) which was largely modeled on the Nuffield science curriculum projects developed in the 1960s, and the African Primary Science Project (APSP), later renamed Science Education Program for Africa (SEPA). This project was popularly known in Kiswahili as "Muulize Fukufuku" ("Ask Fukufuku." Note that this suggests the use of "Socratic" questioning). Lillis and Lowe (1987) find that the British discovery-learning projects were basically part of American curriculum movement. It was through these projects that the discovery-learning paradigm reached Tanzania.

After independence in 1961, there was an urgent desire to "modernize" Tanzania's society and economy. Leaders hoped, as they still do, to solve national problems of development through the *transfer* of science and technology from industrialized countries. It was felt that by turning out a scientifically and technologically oriented workforce greater strides would be made towards economic liberation just as there had been political liberation; hence the strong desire to transfer metropolitan curricula projects into the country even long before the promulgation of ESR policy in 1967. This perception was now placed on a respectable intellectual footing by the emergence of *human capital theory* as the dominant paradigm in development thinking. As indicated before, the central thesis in this view of development was that expenditure on education, especially scientific and technological education, was an investment in human resources that would contribute directly to the development process, hence the assumption of one-to-one relationship between the level of graduates of an educational system on one hand and their employability and levels of income on the other. Besides, international donors of educational projects in the third world like UNESCO and IMF embraced this theory and used it to design development strategies for the young developing countries. The transferability of these projects to the developing countries was seen as non-problematic (Lillis and Lowe, 1987, pp. 167-68).

It has been shown that the discovery-learning movement was indeed rooted in the philosophy and epistemology of the empiricist and positivist school of thought and thus in academic rationalism; and, so were these projects that reached Tanzania. The projects were abandoned after only a few years of experimentation in trial schools or phased out in the mid-1970s due to various difficulties which will not be discussed here but have been documented elsewhere (Lillis and Lowe, 1987; Phythian, 1971; Mmari, 1980) Although the projects were short-lived, their impact on educators' thinking about the nature of an inquiring mind was tremendous. The projects helped to entrench the belief that inquiry was synonymous with the *scientific method*. Some participants believed that, in fact, these projects had ushered into Tanzania real development of an inquiring mind, and praised them to the skies. An official who believed that installation of such top-down programs would help the development of science and technology in Tanzania commented, "Didn't they enable the Americans to go to the moon?"

In fact, under the current Eighth IDA package of the World Bank for Tanzania (World Bank, 1990), science teaching was expected to be improved through the "importation" of ready-made "Zim-Sci" kits and accompanying materials which would be *reproduced* and installed directly into secondary schools. A special Textbook Production Coordinating Unit (TPCU) had been set up to oversee the "implementation of curriculum as instrumental action" (Aoki, 1983). A World Bank expert was also stationed in Tanzania to ensure that the installation process succeeded. Such is the notorious contradiction between ends and means that faces Tanzanian educational system.

Teacher And Tutor Involvement to Develop Inquiry-Oriented Projects

Had the government and political leadership taken the goal of developing an inquiring mind seriously, teachers would have been involved in various activities and projects at school and other levels intended to help them understand the concept and design programs and projects individually and collaboratively to translate their perceptions and beliefs into actual inquiry-based experiences. With government support and motivation, and a flexible, invigorating working climate, teachers would have initiated innovative projects of their own along with their students. There would have been inquiry-oriented activity in school, particularly at "class-roots" level and this activity would have been reflected in the school timetable, student and teacher actions and discourse, displays in the classrooms and staffrooms, and the basic characteristics of the ethos of the school. This scenario, however, was absolutely absent in all secondary schools visited and Dar-es-Salaam Teachers College. All teacher and tutor participants said that they had never been involved in any project or activity of that kind. They also said they had not initiated their own projects for various reasons which are discussed in chapters seven and nine.

THE ROLE OF THE INSTITUTE OF CURRICULUM DEVELOPMENT

This section looks at the role the Institute of Curriculum Development (ICD) has played in the development of an inquiring mind and some of the problems it has been facing. According to Tanzanian educational system, the ICD was the MOEC's organization which was directly responsible for the promotion of an inquiring mind through the mandatory school and teacher education curricula it developed including the textbooks it wrote.

The ICD exercised its functions through a system of *subject panels* and *boards*. The former operated *vertically*, while the latter operated *horizontally*. A subject panel dealt with subject matter from primary through to secondary, teacher and technical education levels. Panels were responsible for initiating, planning and developing the curriculum for their disciplines at these levels. Specifically, subject panels were charged with the *"formation of subject goals; selection of content, teaching methods and learning strategies; writing syllabuses, textbooks, and teachers' guides; conducting seminars, workshops and inservice teacher education; and preparing relevant teaching and learning materials"* (Institute of Education, 1982, p. 16). Membership of a discipline panel included curriculum developers who were resident at the institute - the ICD's subject specialists, and nominated representatives from various educational institutions who usually included one or two teachers, teacher educators, university lecturers, and educational administrators.

All the panels' plans, decisions, and curriculum products had to be ratified by Curriculum Boards before being forwarded for approval to the Commissioner for Education at the MOEC headquarters. Curriculum boards were responsible for coordinating curriculum decisions and activities horizontally, at primary, secondary, and teacher education levels. Therefore, there were three curriculum boards. The Secondary Curriculum Board, for example, was charged with ensuring that different secondary curriculum subject panels all worked within the goals and objectives of secondary education. The board also compared different syllabi, books and curriculum materials produced by different subject panels to compare standards and to ensure uniformity of the syllabi. Curriculum boards were comprised of senior bureaucrats including representatives from NBCTA and the Inspectorate, and MOEC officials from the relevant directorates. The Director of the relevant level in the MOEC chaired the curriculum board. As it can be seen, the ICD was tightly controlled from the MOEC headquarters

and the operation of the panels was severely limited by this top-down centralization of curriculum decision-making.

Educator and administrator interviewees including curriculum developers themselves responded to the question: *How do you assess the role of Institute of Curriculum Development in the development of an inquiring mind?* All of them were of the opinion that the ICD has been unable to interpret the inquiry goal and operationalize it in teaching and learning activities. Some participants believed that the ICD was itself a great obstacle to the realization of this goal, and that it was not in a position to provide appropriate guidance or, as one participant put it, "champion the course of promoting an inquiring mind by providing several alternatives to the teacher." An official interviewee who had been transferred from the ICD to the MOEC headquarters and had worked with the Institute for a long time believed that "the ICD is essentially not developing the curriculum. It is writing a single textbook for a pupil and a single teachers' guide for a teacher and lovely syllabi as directed by MOEC headquarters." Incidentally, teachers' guides and syllabi for geography were not available in schools and there was a shortage of copies of ICD geography textbooks.

One reason for ICD having failed to play a leading change agent role in the development of an inquiring mind was the bureaucratic top-down mode of decision-making and administration exercised by MOEC authorities and consequent tight control of ICD's deliberations. All participants who responded to this question believed that the ICD was inactive and incapable mainly because it was being incapacitated by MOEC's constant interference in its professional activities and thus depriving its staff the freedom to think of and try out new ideas on experimental bases. MOEC authorities were prescribing what the Institute had to do; and most of these tasks were *ad hoc* and peripheral or totally unrelated to its mission of curriculum development. A former curriculum developer reported that "all along the ICD is always operating at the crisis level. Everyday there is a new thing that is required by the authorities at the MOEC headquarters to be done as quickly as possible. So the ICD staff start struggling to prepare something according to instructions." A resident curriculum developer complained, too, that "the ICD has no autonomy to develop an inquiring mind in schools. Our day-to-day work is prescribed by policy makers; we cannot do anything without them coming in and imposing something for us to do. It is as if the ICD is a *secretariat* of the MOEC officials. The bureaucrats dictate to us what we have to do and how to do it. We may strive to be professionals, but we have no freedom to use our expertise or ideas the way we find it fit."

The procedure of curriculum implementation used by MOEC was purely a top-down installation process of materials produced by ICD and those secured by MOEC's newly formed Textbook Production Coordinating Unit (TPCU). Curriculum implementation meant spreading the syllabi, textbooks, and other curriculum materials from the prophets at the center to the faithful followers in the field, the periphery. The faithful serving teachers were at the same time expected to act magically by working individually to interpret the goals and content of the installed curriculum and translate them into activities conducive to the promotion of an inquiring mind. The assumption was that once the curriculum developers had identified goals, listed topics in the syllabus, provided teachers and pupils with a single textbook for a class level, and that once every important decision had been made by MOEC authorities about what would happen in the classroom, teachers would be able to inculcate an inquiring mind and children would automatically become thoughtful inquirers.

This attitude, however, may be attributed to the *culture of conservative individualism* induced and perpetuated by academic rationalism, which also leads to the

alienation of the teachers through the process of socializing them to accept the role of *authoritative subject specialists*. A geography teacher, having been socialized to view himself or herself as a *geographer*, tends to view himself or herself as an independent, subject specialist at "class-roots" level. Consequently, this sham independence coupled with rigid timetables and other conservative practices, becomes a barrier between individual teachers within the same school or even a department, thus hampering collaboration among them. Individual teachers come to develop a feeling that they are unqualified or not free to *trespass* upon the dominions of other teachers. The specific values of each subject or even a topic within a subject have been pressed to the neglect of the values common to several or to all. This way, the school course has come to resemble the "hundred yards" course, each subject following a track marked off from the others by a tape.

Unfortunately, some administrator participants, particularly those from the MOEC headquarters tended to confuse and equate this "conservative individualism" with "teacher autonomy" or "freedom." They claimed that individual teachers had freedom and full power to use the methods and content they thought were appropriate to develop an inquiring mind. These officials, however, being mindless of the numerous pressures that exerted themselves to teachers, pupils, and schools from various sources, failed to distinguish between sham autonomy and such individualism which MOEC in general and ICD in particular helped to perpetuate.

Some participants felt that, in fact, MOEC had confined the role of ICD mainly to that of the *production* of syllabi and instructional materials. The actual *installation process* was being done by MOEC departments. Once the subject syllabus and any curriculum materials produced by ICD had been approved by MOEC, they became official government documents. The MOEC then assumed responsibility for disseminating those documents to schools and teachers colleges and for supervising their utilization. The ICD, therefore, had no direct links with schools and teachers colleges.

Dissemination of curriculum materials was done in two ways. First, syllabi were mailed directly to schools; second, textbooks and other educational supplies were distributed by respective MOEC's departments - the Department of Secondary Education in this case - and Tanzania Elimu Supplies Ltd. (TES) (especially for primary schools). Schools had to notify their requirements to the MOEC, which in turn placed orders with TES, or alternatively authorized schools to order their requirements directly from dealers. Even under the new set up designed under the World Bank's Eighth IDA project, the Institute's School Equipment Development Unit (SEDU) would provide the professional and technical services for equipment design and prototype production. The dissemination of the finished materials would then be passed on to the Textbook Production Coordinating Unit (TPCU) at the MOEC's headquarters. Once the materials were disseminated by MOEC their utilization became obligatory down to the smallest detail. Fidelity was then monitored regularly mainly by the Inspectorate Department. All these arrangements must have incapacitated the ICD to go beyond global statements of ESR policy and dig deep into notions such as "an inquiring mind." "Conceptualization of an inquiring mind by ICD is a nicety which MOEC cannot afford when its priorities of producing a textbook and teachers' guide are not yet met," one participant commented.

Several participants, including curriculum developers themselves, said that subject panels were not as effective as they used to be because they were not meeting as often as they were required due to lack of funds and other necessary facilities. A tutor from Dar-es-Salaam teachers college who was a member of geography panel said he had not been invited to attend panel meetings for two consecutive years. Lack of funds and other resources were said to have crippled the Institute's capability to conduct research,

write manuscripts according to schedule, interact and collaborate with local and international institutions dealing with curriculum development, conduct inservice courses for its staff and teachers, and produce good quality products.

Regarding the quality of ICD's products, all teachers and even some pupils complained that the textbooks written by the Institute suffered serious shortcomings. For instance, they said, the textbooks were shallow, contained errors and misconceptions of several concepts and principles, were poorly proofread, contained unattractive printing and illustrations, and were filled with unauthentic materials borrowed from out-of-date and irrelevant secondary sources. A more important shortcoming was that the textbooks were written in a *didactic*, spoonfeeding style which encouraged mere lecturing and copying of information paragraph by paragraph, without any attempt to build into them some inquiry-oriented activities. Even revision questions at the end of each chapter encouraged ground coverage of the text by copying the sections which those questions referred to and then learning them by rote memorization.

The Institute also was faced with the problem of recruitment of its staff. Indeed, some participants believed that the poor quality of the Institute's products may have been due to limited or lack of knowledge, expertise, and experience of the ICD staff in the production of instructional materials and curriculum development. Their role in the preparation of educational materials included planning, organization, writing, and designing of pedagogical materials. This role required the employment of certain kinds of knowledge and skills which some curriculum developers admitted they did not possess. They said very few of them had formal education and grounding in curriculum development. The majority of those who had some formal education had attended only short courses.

In the geography department of the Institute, none of the curriculum developers had formal education to design, prepare, and develop teaching and learning materials. A geography curriculum developer participant agreed that they hopelessly lagged behind many kinds of new developments in the thinking and practice of curriculum development and instruction. Almost all the curriculum developers at the Institute had acquired curriculum development knowledge and skills through on-the-job experience and trial-and-error learning. All of them were initially recruited from schools as classroom teachers who had no systematic education in the field.

The ICD participants also agreed that their conceptualization of an inquiring mind was too narrow and inadequate to allow them to unpack the concept of an inquiring mind and build it effectively in the school and college curricula. These participants said that the education they have had from schools, teacher education institutions and elsewhere did not deal with the concept of an inquiring mind or involve them in inquiry-oriented activities. A curriculum developer participant was frank about this issue:

> I admit that I have never studied or researched about this concept of an inquiring mind or tried specifically to find out how to develop it. During my teacher education courses at both Teachers College and University of Dar-es-Salaam this issue was mentioned in philosophy of education and development studies lectures but just in passing. I don't remember to have studied this concept as such in relation to teaching or curriculum development. Schools and teacher education institutions have hardly fostered an inquiring mind.

Like teachers and pupils, curriculum developers at the Institute also accepted that they needed help in this field.

The fact that teachers recruited to develop curriculum in the ICD felt that they were underqualified in this field is itself a reflection of the inadequacy of the "curriculum development" component of the preservice teacher education course offered in teachers colleges and Faculty of Education. Indeed, in his study, Bayona (Bayona, 1988; Punch and Bayona, 1990) found that "most teachers in Tanzania have not taken any training in curriculum development. Only 23 percent have had some training in this field and nearly all of these have acquired this training from overseas" (Punch and Bayona, 1990 p 264). Bayona further found that "in terms of the need for knowledge and skills in curriculum development 77 percent of the teachers strongly agreed and further 20 percent agreed that qualifications in the curriculum field are necessary requirement for classroom teachers" (Punch and Bayona, 1990 p. 264).

Teacher and tutor participants made similar observations. They said that curriculum development was seldom taught in preservice teacher education courses mainly due to the "crash" nature of the programs. When taught, curriculum development was lectured theoretically and superficially and thus treated shallowly and hurriedly to secure time for other topics which teacher educators thought were most significant and relevant to the student-teachers' future as practicing teachers. In other words, curriculum development was regarded by teacher educators as a topic that was of peripheral significance to teaching and learning; it, therefore, could be skipped when time was not available to teach the topics that were perceived to be central to the teaching profession.

The procedure employed to select the Institute's panel and board members did not guarantee the utilization of the capabilities and experiences of the majority of classroom teachers and various talents across the country. The non-resident members were nominated by respective ICD's subject curriculum developers. There was no agreed criteria for representation. The recruitment arrangement gave no clear access to teachers and could only allow their *token* participation on the panels because curriculum development process was not school-based. This system also excluded open-ended collaboration of the ICD with members of various educational institutions in the country, and the utilization of the knowledge and skills of the people not directly involved in education - sociologists, doctors, anthropologists, engineers, religious leaders, peasants, and others - who would have helped to blaze the trail of new advances in education. A tutor who was a member of geography panel found that most nominated members were not vested in curriculum development matters as they were usually selected because of their identification with the discipline in question - for example, heads of subject departments - rather than their professional, academic, and pedagogical contributions and interest in the curriculum field.

Members of the curriculum boards also got recruited along the same principles. No school teachers, teacher educators, local and regional education officers or heads of schools were represented on the curriculum boards. MOEC's bureaucrats became board members by virtue of their administrative rather than professional and pedagogical competencies and interest in curriculum development and instruction. As a result they may have lacked the capabilities and interest to deal with complex and trying curriculum issues such as fostering an inquiring mind. It is possible that their participation in the boards was limited to mere rubber-stamping of panel decisions rather than providing a serious and well-informed curriculum development function that was likely to contribute to the meaningful fostering of an inquiring mind.

An important observation is that the administrative structure of the ICD institutionalized academic rationalism by organizing panels and departments according to the academic tradition. Being a replica of the British model, the Institute's ethos could hardly fail in being academic rationalistic in nature. Since each panel dealt with a

particular discipline, its subject specialists and nominated members naturally had to operate *vertically*, which meant that there was little, if any, relationship and interaction between different subject panels. Lack of horizontal communication among subject panels demonstrates clearly the alienating and individualistic power and effect of academic rationalism resulting from its inherent business metaphor which induces atomistic specialism. There was a strong belief in the existence of neat boundaries between disciplines, hence discipline-based organization of the Institute's structure which, of course, extended to school and college levels.

Such rigid vertical organization according to disciplines ruled out meaningful collaboration among panels, a necessary condition that would be needed to harmonize curriculum effort across disciplines; avoid unnecessary repetition of content; share expertise, experiences and resources, and avoid their duplication and thus minimize costs; and, to pull together the energy needed to turn disciplined and non-disciplined knowledge, skills, and dispositions into suitable pedagogical knowledge and activities that would be appropriate for the development of an inquiring mind. Academic rationalism not only alienates teachers and students but also curriculum developers and other educators, policy makers, and educational administrators operating within such a highly centralized and compartmentalized system. The entire business of educational planning, curriculum development, teaching and learning all become dictated by the power of the ethos of academic rationalism and its concomitants. In the final analysis, the whole nation becomes alienated and externalized from dealing with central contradictions involved in its developmental goals and actions.

Another point related to this phenomenon is a wide gap that existed between what was *planned* to be taught - syllabuses, textbooks and teachers' guides - and what was actually being taught by teachers. Consequently, two very different curricula existed - the official curriculum of the ICD, and therefore of MOEC, and the *actual* curriculum of the schools. Aoki refers to these two types of curricula as "curriculum-as-plan" and "curriculum-in-use" or "lived curriculum" (1983; 1993). The chasm between the two curricula may be attributed partly to the academic rationalist effect of separating theory from practice, which manifests itself as a separation of "curriculum development theory" from "instructional theory," the latter being viewed as a technical process of putting planned curriculum into technicalist practices through installation process. It seems that in Tanzania, the gap between these two curricula was not narrowing. It is possible that the perception of the existence of the contradiction between the "planned" and "lived" curricula was an obscure or non-existent phenomenon in the minds of Tanzanian educators, curriculum developers, evaluators and policy makers who influenced curriculum decision-making. However, having been nutshelled in the educational and administrative ethos which is antithetical to the development of an inquiring mind right from its inception, the Institute would have hardly taken an effective change agent role that was needed in its pioneering mission of fostering this crucial goal in Tanzanian educational institutions. It seems that current curriculum thinking and practices have tended to turn much of the educational system into a self-defeating system.

SUMMARY

The focus of this chapter was the exploration of curriculum factors which have influenced the fostering of an inquiring mind in Tanzanian secondary schools. The chapter consists of two sections. The first section looked at the problems related to the conceptualization of an inquiring mind. The major finding in this section is that this concept of an inquiring mind has hardly been adequately conceptualized or interpreted and researched for the purpose of operationalizing it in the school and teacher education curricula. As a result, the inquiry goal has not been understood either by educators or by

those who had the responsibility to interpret it and translate it into actual classroom activities. The participants either held a parochial view of an inquiring mind or did not have any idea or vision of this goal.

The second section on the secondary school curriculum looked at the nature of and basis for curriculum development and implementation. The basic finding is that the geography syllabus and indeed other discipline-based curricula were rooted in the traditional empiricist, positivist, and academic rationalist ethos which was totally antithetical to the intent of developing an inquiring mind. This ethos, which has its roots from the colonial educational curricula and instructional practices and attitudes, underlay the philosophical, psychological, political, and other principles and concepts that curriculum developers, educational administrators and others have been advocating and using as the basis for curriculum design, teaching, learning, and even evaluation. The culture of academic rationalism has been entrenched in every nerve and vein of all curriculum deliberations in this country.

CHAPTER SEVEN

FACTORS RELATED TO TEACHER EDUCATION

INTRODUCTION

This chapter looks at the factors related to the education of the people central to the task of developing an inquiring mind in secondary schools, the teachers. Teacher education was therefore assumed to be one of the most critical factors on which successful fostering of this goal depended. As it can be seen from Appendix A, some questions in the teachers' interview guide were intended to capture the factors related to the preservice and inservice teacher education. Factors on teacher education were also revealed in several other questions of this guide such as a question about the factors which influenced teachers' own ability to inquire and about the characteristics of a "model" teacher as perceived by teacher interviewees. Questions in the pupils' interview guide (Appendix B) also probed for some factors related to teacher education. The administrators and teacher educators' interview guide (Appendix C), too, probed into issues and problems of teacher education, particularly under a question about the hindering factors, but these issues tended to be raised in other questions as well. Other sources of information on teacher education included several documents and my personal observations. An overview of teacher education programs in Tanzania is made first, followed by a discussion of the findings on the factors related to preservice and inservice teacher education.

TEACHER EDUCATION PROGRAMS

The policy of the government of Tanzania regarding the staffing of secondary schools was that teachers had to be university graduates and holders of the diploma in teacher education. Teacher education was both university-based and college-based. Most university graduate teachers took their teacher education from the Faculty of Education (former Department of Education) of the University of Dar-es-Salaam, and some of them studied it from overseas particularly at Masters and Ph.D. levels. At the time of field investigation, diploma teacher education was being offered in twelve of the forty teachers colleges. This study focuses only on secondary and teacher education undergraduate and diploma programs of teacher education that were being offered in Tanzania, the purpose being to find out the degree to which they fostered teachers' ability to inquire and to develop students' inquiring minds.

Undergraduate Preservice Teacher Education Program

Graduate teacher participants who studied education from the former Department of Education and the participant professor from the Faculty said that up to the time of field research, the undergraduate program for teacher education was a *three-year* course plus a *fourth term* which was called "third year part two" (University of Dar-es-Salaam, 1987). However, with effect from 1990/91 intake, courses offered in the Faculty of Education began to be within the framework of the *four year* education program (University of Dar-es-Salaam, 1992, p. 85). The undergraduate program was partly inservice in the sense that it was an upgrading course for practicing teachers.

The first year education course was a core program taken by all students, but beginning from the second year to the fourth term or fourth year there were specializations according to three streams. Stream A consisted of secondary education; stream B, teacher education; and stream C, adult education. All education students studied the academic disciplines from the Faculties other than the Faculty of Education. From the latter Faculty,

they only studied education which included educational foundations which consisted of philosophy of education and sociology of education; educational psychology; educational planning and administration; curriculum development and evaluation; educational media and technology; and teaching which included an introduction to teaching and teaching practice (practicum) (University of Dar-es-Salaam, 1987; 1992).

Besides this education course, students were required to take two academic subjects from academic faculties, one being a major and the other a minor subject. From the Faculty of Arts and Social Sciences, students would select two subjects from the following *teaching* subjects: geography, history, literature, Kiswahili, English, French, economics, political science and public administration, and fine art, music and theater arts. Students taking science subjects selected their two subjects from the following combinations: physics with mathematics, physics with chemistry, mathematics with chemistry, biology with chemistry, and biology with geography.

Two types of degrees were awarded to education students: Bachelor of Education (B.Ed.) was being offered to those who majored in Teacher Education and Adult Education. Those who majored in academic disciplines were offered Bachelor of Arts with Education (B.A. Ed.) or Bachelor of Science with Education (B.Sc. Ed.). Most of the teachers with B.Ed. taught in teachers colleges and adult education institutions, while most of B.A. Ed. and B.Sc. Ed. holders taught in secondary schools, but some taught in teachers colleges as well. Besides the above subjects, all students were required to pass development studies and communication skills as non-optional courses.

Diploma in Teacher Education

The diploma course consisted of three programs. The first was a conventional preservice program in which candidates who had completed Form 6 Advanced Certificate of Secondary Education Examination (ACSEE) - that is, A-level, joined the National Service for one year, and then pursued a two-year course for a diploma in education. The second program consisted of a two-year upgrading inservice program in which Grade A primary school teachers upgraded to a diploma level. The third consisted of a program which was popularly known as the "Mkwawa Model." Under this program, candidates who had completed Form 4 Ordinary Certificate of Secondary Education Examination (CSEE) - that is, O-level, were admitted to the teachers college for three years. During the first two years students had to study and pass three A-level subjects, one of which was Educational Psychology which was made one of the principal examinable subjects for this purpose. Successful candidates continued with the third year studies which included philosophy of education, educational psychology, educational administration, and school organization. This program which began in 1978 and was conducted at Mkwawa, Korogwe, Monduli, and Shinyanga teachers colleges was phased out in 1992 owing to several serious problems that faced it. Mshana (1992) evaluated the sub-program which was offered at Mkwawa Teachers College. Shinyanga and Mkwawa were turned into secondary schools.

Unlike the university-based teacher education which was being conducted in the English language, the college-based teacher education was being taught in the Kiswahili language, and only the academic subjects were taught in English. Another difference was that while the development of undergraduate programs was the responsibility of the university itself, the development of all diploma programs was the responsibility of the ICD. Some of the findings that have been observed in relation to the development of secondary school curricula therefore also apply to college-based teacher education curricula.

The "Diploma Syllabuses for Education" which was followed at the time of field research had been written by the ICD in 1980 and it had not been revised since then (Ministry of Education, 1980). The format of this syllabus was the same as that used for secondary school curricula, but it was more detailed than the latter. It started with a brief introduction outlining objectives for teaching education. This introduction was followed by a matrix of details of prescribed topics and sub-topics, specific objectives, hints on basic content to be taught, methods of teaching it and teaching materials to be used, and lastly the list of major textbooks and reference books and other materials. The syllabus consisted of six major topics: philosophy of education, educational psychology, educational research and evaluation, educational administration and school organization, curriculum development, and adult education. The methods course was included in the syllabus for each academic subject. Thus, the geography syllabus which had also the same format as the one for education, consisted of two parts, the academic geography and geography methods. What follows is a discussion of the findings on the factors related to preservice teacher education.

PRESERVICE TEACHER EDUCATION

All educator and administrator participants believed that *all* preservice teacher education institutions in Tanzania had *failed* to prepare a classroom teacher or teacher educator who was competent enough to develop an inquiring mind in pupils and student teachers. These participants maintained that neither the university-based nor college-based teacher education program was essentially oriented to the development of an inquiring mind. The content and procedures of teacher education programs have hardly been consciously thought out in terms of classroom activities and culture that would foster an inquiring mind.

PRESERVICE TEACHER EDUCATION CURRICULA

Collaboration in Development of Teacher Education Curricula

Tutor interviewees said they had no direct contact with the ICD, except for one who was a member of the geography panel. But even he said he had not attended panel meetings for two years though the panel members were being appointed after every three years. Tutors complained that neither the curriculum developers nor MOEC officials visited the college for the purpose of discussing educational issues such as the development of an inquiring mind or getting a feedback from them. There was also no collaboration of any kind between university-based and college-based teacher educators. Although both institutions prepared teachers to teach in secondary schools and teachers colleges, they hardly collaborated in order to explore the avenues to prepare an inquiry-oriented educator. There was an absence of professional forums to bring together teacher educators, curriculum developers, teachers and others for the purpose of thinking about qualitative improvement of school and teacher education curricula, teaching, and learning.

Balance Between Academic and Professional Studies

All teachers, teacher educators, heads of schools, curriculum developers and a school inspector believed that teacher education curricula at both levels were more oriented to the *academic* work rather than the *professional preparation* of teachers and teacher educators. Both university-based and college-based teacher education programs, and particularly the former, were intended to produce *discipline specialists* well grounded in the ethos of academic rationalism. Unfortunately, this ethos encourages the use of passive methods of teaching and learning such as mere lecturing and other expository and positivistic pedagogy.

The finding that the study of academic disciplines dominated is further supported by the number of academic and education units students took. According to the 1987/1988 prospectus of the University of Dar-es-Salaam (University of Dar-es-Salaam, 1987) which was in use at the time of field research, student teachers who studied academic subjects from the Faculty of Arts and Social Sciences had to take the following units for each of the following subjects (units in brackets): geography (22); history (22); literature (20); Kiswahili (20); English (22); French (22); economics (22); art (22); and music. (22) Students in secondary stream also took 19 education units while those in teacher education stream took 25 units. The average number of the academic units per subject for the nine subjects above is 22.

On the average, each student had to take 44 academic units of the two teaching subjects. Students in the secondary stream took a minimum number of 63 units while those in the teacher education stream, 69 units. As a result, for the secondary stream student, the academic component accounted for 70 percent of the total program while the education component accounted for only 30 percent. For the student in the teacher education stream, the academic component amounted to 64 percent while the educational component, 36 percent. On the average this university-based teacher education program was 67 percent academic and 33 percent professional. The university teacher education program had a strong academic orientation which was more pronounced with secondary education stream leading to B.A. Ed. and B.Sc. Ed. than teacher education stream leading to B.Ed. Figures calculated on the basis of the 1987/88 prospectus can be said to apply to past undergraduate teacher education programs as this prospectus was the same as those in the past years.

One indication of the academic orientation of diploma teacher education curriculum is the geography syllabus for diploma course (Ministry of Education, 1982) which was in use. The syllabus states that it "consists of academic and teaching methods in geography which run concurrently. It assumes 640 actual teaching periods in two academic years: 384 periods allocated to academic geography and 256 allocated to geography teaching methods and practice" (p. 1). In this structure the academic work consisted of 60 percent while the professional component including teaching practice took 40 percent. It can be assumed that this was more or less the same situation for each of the subject studied in the diploma programs.

This syllabus was originally meant for the conventional two-year consecutive diploma program taken by student teachers who had passed A-level before joining the course. For the upgrading and Mkwawa models, student teachers had to spend the first one year and two years respectively studying for A-level national examinations in at least two academic subjects. Half of the course for upgraders and two-thirds of it for students following Mkwawa model were spent catching up with A-level academic work. In addition, the upgraders were supposed to study the whole of the diploma academic component in the second year.

The Mkwawa model student teachers followed exactly the same syllabi which were being taught to high school students. The only difference was that, in normal high school, education (Educational Psychology) was not taught. This program and the upgrading one, particularly the former, were a modified extension of secondary education with some study of education thrown in for good measure. Indeed, it was a high school level of education masquerading as preservice teacher education.

Making Education Academic

Teacher and teacher educator participants said that, as student teaches, the education they were taught at both levels of teacher education consisted mainly of lectures on abstract

theories in sociology of education, philosophy of education, educational psychology, educational administration and school organization, research and evaluation, curriculum development and methodology. All of these were taught as if they were academic disciplines, taking on the characteristics of an academic rationalistic program whereby the assumption is to teach a mass of content about theories which are viewed as unproblematic, and apply them as given and faithfully later in practice. The assumptions underlying such a program have already been discussed.

The unfortunate consequence of this kind of teacher education program is that it alienates student teachers and teacher educators from dwelling on the relevant, real issues and problems of Tanzanian teacher education. There has been a tendency to teach much of education for education's sake rather than rooting it in pressing issues such as the development of an inquiring mind and related problems. The generic, abstract theory which assumes universal application of funded, authoritative knowledge hardly focuses on helping student teachers and their educators to become aware of their own problems and needs. "Academicizing" education helps to widen the gap between theory and practice, externalize student teacher and teacher educator experiences, and eliminate the possibility of grounding teaching and learning in the praxis-oriented, inquiry-based view of teacher education and teaching.

Integration of Theory With Practice

Teacher and teacher educator participants responded to the question: *To what extent did teacher education programs emphasize (a) theory, (b) practice, and (c) integration of both through inquiry-oriented activities?* Integration of theory with practice is one of the critical conditions articulated in the policy of ESR for fostering an inquiring mind. Self-reliance activities and practical-oriented vocational programs and other practicals in real-life situations were partly intended to redress this long-standing problem and cultivate conditions in which an inquiring mind would be fostered in a context of praxis. This key link has been badly and sadly missed in most educational deliberations in Tanzania.

All educator participants said that, in their teacher education programs at both levels, theory was most dominant than practice; and, there has hardly been an attempt to integrate them. Teachers estimated that, as student teachers, between 90 to 95 percent of the teaching and learning time was spent on theory rather than practice. Regarding their own teaching, tutors from Dar-es-Salaam teachers college estimated that theory consisted of between 85 to 90 percent. Whatever these estimates mean, the crux of the problem is that theory achieved a higher status than practice and both were viewed as dichotomous entities rather than interactive aspects of teacher education program.

Educational Research And Evaluation

One way to develop an inquiring mind is to engage learners in research and evaluation activities. Indeed, both university-based and college-based planned curricula for teacher education included research and evaluation. The undergraduate program included a core unit on introduction to research methods in education and educational measurement and evaluation. Two units of research methods in education were offered as an elective during the fourth year. Educational research was being studied as a component of educational psychology.

The diploma syllabus is more specific on the content to be taught as educational research and evaluation. Subtopics in the research section included the meaning of research; types of educational research: applied, basic and developmental research; and research methods: descriptive, historical, developmental, case and field, survey and experimental

methods (e.g. correlational methods). A section on educational evaluation included the meaning of evaluation; types and uses of educational evaluation - formative and summative types of evaluation; and how they are used to evaluate three domains of educational objectives - cognitive, affective and psychomotor - as suggested by Bloom et al (1956), Krathwohl et al (1964) and Harrow (1969). Another subsection on education evaluation focused on measurement. Prescribed topics under it included development of evaluation instruments; evaluation statistics and how to use them in different types of data to calculate and determine the mean, media, mode, variance, standard deviation, norm, scales, correlation, validity and reliability; and the use of evaluation data for decision-making.

Teacher and tutor participants were asked to assess the extent to which the teaching of educational research and evaluation helped them develop research and evaluation skills, processes, and dispositions and thus promote their abilities to inquire and foster an inquiring mind. University graduates said these topics were taught theoretically and superficially through a series of lectures, as was the case with academic subjects. The focus was not pedagogical but *knowing* some definitions and theories of research and evaluation. University graduates said there were moments when they were engaged in searching for information from the library, writing and presenting papers, and discussing some issues in tutorial or seminar groups. Yet, they said, the central focus of these activities was essentially theory. Students were required to write a proposal, but this proposal was not meant to be translated into actual research; rather it was submitted to the instructor for assigning a grade - that is, for a *summative* function. The teaching of research and evaluation at this level hardly enabled student teachers to develop practical, critical, and reflective inquiry abilities which would help them to experience key elements of an inquiring mind, reflect on various suggestions, and develop a vision that would help them foster an inquiring mind.

Graduates of the diploma program said that educational research and evaluation was a topic which was virtually not taught. This topic was being skipped. All diploma teachers said they were not taught this topic and knew very little about it. These teachers stated that, while they were student teachers, they were required to conduct a research project as one of the two components of NECTA's continuous assessment. All teachers found this activity helpful as it enabled them to learn research skills. However, they also said that the skills they acquired were mainly learned by a trial- and-error approach as they did not get proper and systematic guidance from their tutors on how to conduct a research project. Two teachers reported having been provided with some guidance, but they said it was theoretically lectured and too complex to be of any help in practice. Teachers themselves were expected to teach their pupils some rudiments of research because, the pupils, too, were required to conduct such research projects as part of continuous assessment. Teachers also said they were handicapped to help their pupils with research because of their inadequate background in research and evaluation. Tutors, too, agreed that it was difficult for them to teach research and evaluation for the same reason of lacking good background and experience in the field. "We try hard to help our student teachers but I feel that we all need help in order to provide them better guidance. This is a field where an inservice course for us would be most appropriate," a tutor observed.

It should also be noted that these projects initiated by the Examinations Council were examination oriented, intended for summative assessment. Educators and learners hardly viewed them as a day-to-day teaching and learning inquiry activity; consequently, the projects were done as *terminal* activities. Another point to note is that at both levels of teacher education topics and subtopics included in the program on educational research and evaluation suggest the dominance of quantitative rather than qualitative paradigms in Tanzanian educational system. Indeed, according to current changes in the undergraduate teacher education program, educational research has been confined only to the field of

educational psychology and much of it was optional (University of Dar-es-Salaam, 1992 pp. 87-91).

Academic Practical Activities

Academic practical activities were another component of teacher education planned curriculum which would help student teachers develop their inquiry abilities through practical experiences. In fact, this section included research methods as well. The university-based academic geography course did not include a section on "practical" geography as such. The 1987/88 prospectus shows that, during the second year, students taking stream C geography (education students) would take as an option "Remote Sensing and Quantitative Methods." Another option which had a bearing on research and practical geography was "Dissertation" which would be done in the third year. As optional units, students who had no interest in research would avoid them. The extent to which practical geography was built into planned curriculum for undergraduate students was unclear, and it was difficult to pursue this issue as the university was closed due to student unrest.

Topics in practical geography for diploma course were clearly listed in the syllabus and were compulsory. They included map reading and interpretation of topographical maps, climatic, economic, and population data and maps; data presentation and interpretation; ground and air photograph interpretation; and surveying by using chain, plane table and compass methods; and leveling. Research methodology in the diploma geography syllabus included the identification and selection of a problem; methods of collecting information: literature study, direct observation, measurement and interviewing; analysis of data: tabulating, calculating and mapping; and writing the report. Even other academic topics included some practical activities. For instance, in the study of water resources of East Africa, students were expected to make a survey of a stream and draw its long and cross profile; in the study of soils students were supposed to conduct the actual analysis of soil characteristics and survey the distribution of soil types in an area. Geography tutors found this syllabus to be a good one as it partly included inquiry-oriented activities. They were of the opinion that if the syllabus was taught as required, it would help foster some inquiry elements.

Like other practical oriented activities however, this part of teacher education at both levels was either lectured theoretically and superficially or not taught completely. My observation at Dar-es-Salaam teachers college revealed that practical geography was taught by copy-copy and talk-and-chalk method. The college lacked almost all necessary equipment for conducting practical experiences and the geography room, which was once among the best in Tanzanian teachers colleges, had been turned into a political meeting room. Tutors, like secondary school teachers, agreed that they had poor background in practical geography. This vicious circle had led to the gradual disappearance of practical activities in both teachers colleges and secondary schools. I have already shown that practicals were not being taught in schools, particularly those involving field work and practical manipulation of equipment. In fact, pupils estimated that, in their learning, theory accounted for over 95 percent and practical activities only 5 percent. This problem was aggravated by the NECTA's decision not to examine practicals at O-level, and we will see more on this question later under evaluation. The *backwash effect* of such examinations was to orientate teaching and learning in both teachers colleges and secondary schools towards theory alone and neglect practical activities.

Self-Reliance Activities

If well used, self-reliance activities would facilitate the development of an inquiring mind by using them as a laboratory to integrate theory with practice, apply and generate

new knowledge, and thus have student teachers learn by doing in the real sense of the word. University graduate participants said that the university never conducted such activities; there was no such thing as self-reliance projects in which students were involved as was the case with teachers colleges and secondary and primary schools. The total absence of these activities at this highest level of learning which is oriented to academic tradition, was a manifestation of the degree to which academic rationalism had entrenched itself in the thinking and practice of those who influenced the nature of the ethos of this institution.

Diploma teacher participants had varying views about how self-reliance activities were conducted in their teachers colleges when they were student teachers. Some said that there was very little activity in this regard. This was particularly the case with Dar-es-Salaam teachers college. At this college there was no single self-reliance activity that went on and involved student teachers. What could be seen were empty and dilapidated shelters which once housed poultry, piggery, and dairy cows. A teacher participant who had studied there during the 1971/72 one-year crash program reported the existence of several well-run projects including a college shop, all of which were managed by students themselves. None of them was existing at the time of field research.

On the other hand, other diploma teachers reported having been engaged in "heavy duty" self-reliance projects in some teachers colleges. Teachers complained that in such a situation, self-reliance activities were conducted at the expense of allotted teaching and learning time. "It was too much. At times classes were canceled in order to do these projects," a teacher lamented. Of course there were colleges where self-reliance projects were conducted reasonably well; but, in all cases, they focused on producing goods and services *per se*. There was no attempt to relate them to the day-to-day teaching and learning or associate them with the development of an inquiring mind. These activities were not part of a planned teacher education program as such. Although they were included in the timetable they were not included in the syllabi. Consequently, they were perceived as extra-curricula activities. There was no course to help teachers and tutors learn what was involved in the supervision of these activities or how they could utilize them in teaching and learning.

Coursework in Methods of Teaching

The topics or units which focused directly on *teaching* the teaching methods in the university-based teacher education program included two weeks of "Introduction to Teaching," and two units for Arts students (one unit for Arts students was equivalent to three units for science students) of "Teaching Subject Methods." The actual teaching of teaching methods was thus allotted two units out of 19 units in the Arts secondary stream - that is, about 10 percent of the entire education course, and out of 25 units in the teacher education stream - that is, about 8 percent of the whole education course (University of Dar-es-Salaam, 1987; 1992). Time allocated to the actual business of teaching was very little compared to that devoted to "academicized" education.

In fact a professor participant from the Faculty of Education said that even teaching methods there were mainly lectured theoretically to student teachers. While commenting on the vicious circle that even university teacher educators were teaching as they were taught said:

> I would say here, too, we teach mainly as we were taught. Teacher educators who are doing the teaching now were themselves not taught by engaging mainly in critical thinking and active problem-solving. The approach of teaching the methods of teaching at this university is not

> appropriate at all. Methodology courses are taught to student teachers by a series of lectures. For this reason we can't claim to be models of teaching critical thinking. How can you develop critical thinking by lecturing *about* critical thinking? When our students go to schools and begin teaching, they do likewise; they give series of lectures like ourselves. We can't claim we have been able to prepare teachers who can plan for inquiry-oriented activities. We have never been serious about it either.

Also teachers said that most of what passed for theory in methodology was an abstract mass of platitudes and generalizations not rooted in classroom reality.

Some graduate teacher participants said they occasionally did some simulated teaching which they called "demonstration" teaching. Student teachers selected a topic from secondary school syllabus and taught it in groups to their colleagues in seminar sessions. However, the major purpose for this simulated teaching was to perfect the efficiency in the *application* of the lectured instructional "techniques" and "competencies" or "skills" which were viewed as unproblematic. None of the graduate teachers reported having taught in schools or observed practitioners teach and analyze actual classroom interactions during methodology courses in order to make a study of and critically reflect upon the actual classroom problem situations. According to graduate teacher participants, they did not reflect upon their simulated teaching.

Another characteristic of university-based methodology course was that courses in the area of academic specialization were taught in isolation from the corresponding methods units. The academic instructor had nothing to do with methods of teaching nor did methodology instructor know what students had learned in the academic course. This separation of the academic work from methods of teaching and the fact that "methods" was a distinct topic separated from other "academicized" education units are both a manifestation of the traditional chasm between theory and practice. Besides, the teaching of methodology was organized vertically according to academic teaching subjects. There were twenty teaching subject methods in the secondary education stream and eight in teacher education stream (University of Dar-es-Salaam, 1987, pp. 64-65; 1992, pp. 88-89). Each stream was taught separately, thus duplicating resources and depriving students the opportunity to learn the methodologies used in other subjects and reflecting on overlaps and common experiences. This approach also reveals the extent to which the notion of specialism embedded in the business metaphor was operating tacitly at this level.

The methodology course for diploma students, like the university-based one, was also discipline-oriented. For each teaching subject taught at this level there was a corresponding section for teaching methods of that particular subject. For instance, academic geography syllabus also consisted of a section about methods of teaching this subject. But, unlike university-based program, tutors who taught an academic subject were the very ones who also taught the methodology of teaching that subject. It was also stated, in the planned geography curriculum, that the academic and methodology sections were to run concurrently, though this was not always the case with lived curriculum.

The topics listed in the geography syllabus for diploma methodology course included: Analysis of the aims of teaching geography in Forms 1-4 and Grade "B" and "A" of teachers colleges and relating those aims to those of Education for Self-Reliance policy; analysis of the current geography syllabi of the two levels above and examining and evaluating content, objectives, methods and source materials prescribed in those syllabi. Other sections included how to prepare schemes of work, their importance in the teaching process, and how to prepare lesson plans and lesson notes. A section on prescribed

teaching techniques included field studies; guest speakers; sample (case) studies; simulation, for instance, imaginary visits, planetarium, and model demonstrations; discussions and questions; demonstrations (such as microteaching); group and individual teaching methods; assignments; and lecturing. Another section included teaching materials and equipment; how to handle and use chalkboards, textbooks, atlases, terrestrial globes, specimen collections, projectors, slides, microfilms, film pictures and photographs; making teaching aids from local resources; and maintenance of teaching aids. Testing and evaluation was another section under methodology. This section included identification of different methods of testing, test item construction, ranking student responses, and evaluation techniques. The last section included how to plan and organize a Geography Room.

Diploma teacher and tutor participants said that, due to time constraints necessitated by the *crash* nature of the diploma course particularly with respect to upgrading and Mkwawa models, methods of teaching were taught very briefly, hastily, and superficially for a period ranging between *one* to *two* weeks in the entire course. The course was lectured theoretically and the content was abstract and hardly reality-oriented as was the case with the university-based program. An official from MOEC headquarters who had taught for a long time in teachers colleges said:

> What I see as a very important point to make in the teachers colleges is the way learning is actually conducted or organized. It is only the so called lectures. Tutors there only lecture; ... I don't remember to have seen seminars, tutorials, or even debates over these years. In fact some years back there used to be a lot of discussions, a lot of debates, a lot of what not, but these days I don't think there are any. Even clubs are no longer still existing."

At both levels of teacher education, methodology courses lacked a deliberate focus on the exploration of the concept of an inquiring mind and avenues to foster it at those levels and in schools. Methodology emphasized a technical focus in which student teachers were lectured a given set of teaching techniques or skills which they had to be proficient at applying in the classroom. Such teaching methods or skills which teacher participants cited as having been lectured to them to teach geography included: (1) lecturing; (2) group work; (3) discussions - whole class and group, debates; (4) project work; (5) presentations; (6) questioning; (7) practicals - in-class and field work, visits/excursions; (8) guest speakers; (9) demonstrations, including use of models; (10) use of teaching aids, including the blackboard and educational media and technology; (11) evaluation - giving assignments; provision of feedback, checking for student understanding; (12) planning for instruction - writing schemes of work, lesson plans and lesson notes, use of time; (13) motivating students, student involvement, giving rewards and punishments (14) classroom management and control, maintenance of order and discipline; and (15) personal factors - general appearance, confidence, mannerisms, and cooperation with staff and students.

Teaching Practice

To find out the effect of teaching practice on the preparation of a teacher who was able to effectively develop pupils' inquiring mind, teacher and tutor participants were asked to respond to the question: ***How do you assess teaching practice in preparing you to become a teacher/tutor who is able to effectively develop pupil's inquiring mind?*** To obtain more views about the role of teaching practice in fostering an inquiring mind in student teachers, other teacher educators and some officials were also requested to comment on this issue.

Block Teaching Practice

Field experiences at both levels of teacher education consisted of what was called Block Teaching Practice (BTP). During BTP student teachers went to teach in secondary schools or teachers colleges depending on their specializations. The students taught for several weeks and were assessed by their instructors and, in the case of university-based teacher education, by co-opted supervisors from other educational institutions such as the ICD. The teaching practice experiences of university graduates discussed in this section are based on the program they actually went through as student teachers, and as documented in the 1987/88 prospectus (University of Dar-es-Salaam, 1987); but, current changes are also explored.

The overall assessment of teacher, tutor and other participants was that, although BTP was helpful in several ways, its focus was not primarily on enabling student teachers to acquire the ability to foster an inquiring mind. Positive aspects of BTP they cited were that it accorded student teachers the opportunity to teach the real classroom and have a feel of what teaching really was like through first-hand experience; gain self-confidence; practice some methods of teaching they had been taught; and learn from the school community and its immediate environment.

The shortcomings cited by the participants were that the time for teaching practice was not enough. For diploma programs the allotted time for BTP was six weeks. Teachers reported varying durations they actually spent in the field, ranging from 3 to 6 weeks, with an average of about 4 weeks. Shorter durations were reported by teachers who had graduated from a one-year conventional diploma crash program, two-year upgrading and three-year Mkwawa model programs. Reasons they gave for shorter durations of BTP included lack of funds; misuse of money allocated for BTP by college leadership; and the crash nature of the diploma programs - it was impossible to spend six weeks on teaching practice alone if other topics in the syllabus had to be taught. During the last year (second for upgraders and third for Mkwawa model) students were expected to study and do everything in "Education" syllabus, including methodology, teaching practice and final national examinations leading to a certificate for diploma in education. This unrealistic situation must have compelled the college administration to reduce the time for field experiences to less than six weeks. University-based teaching practice, which was done only during the second year, was eight weeks long and teachers reported no variations in that duration. This duration has currently been increased substantially (University of Dar-es-Salaam, 1992). I will return to this issue shortly.

Other reasons which led to loss of time for teaching practice included poor traveling arrangements, poor communication between teacher education institution and school or teachers colleges where student teachers were going to teach, lack of accommodation for students and other problems of settling down in a new environment and interruptions. All teachers and tutors said time for teaching practice was too short for student teachers to improve or change their teaching practices. For this reason, they found it inadequate for student teachers to do teaching practice only once in the entire course.

Besides time constraints, other teachers complained that teaching practice was a frustrating experience. They said they were given *difficult* topics to teach such as practicals for which there was no equipment or references to use. Those teachers who said, as student teachers, tried to use methods involving pupils to find out information and discussions, faced resentment by pupils against these methods because they were new to them, and they demanded to be given notes. The same resentment was reported by tutors with respect to student teachers. Teachers and tutors also said that discussions in the classrooms were hampered by language problems. The use of the English language as a

medium of instruction made discussions difficult or sometimes impossible to conduct. A number of teachers found teaching practice to have not helped them at all, and were indeed " a waste of time." Most teachers and tutors found that their teacher educators at both levels hardly associated teaching practice with the development of an inquiring mind. "For them [teacher educators] teaching practice is simply a routine yearly event that has to be done," a teacher observed. A number of other teachers found it difficult to assess whether or not teaching practice helped them learn how to foster an inquiring mind. They said that, since they didn't know what the concept consisted of, it was not easy to judge whether or not they developed an inquiring mind during their field experiences. "How do you know that you are developing what you don't understand?" a teacher queried. These teachers lacked the criteria upon which to base their assessment.

Other problems involved provision of feedback to student teachers. Teacher and tutor participants said that, after assessment of student teachers, verbal feedback was given hastily and superficially or was not given at all. They said teaching practice sessions were not followed by meaningful conferencing. If conferencing was done, it was very brief, and lasted for no more than five minutes. Most diploma teachers reported the lack of conferencing, and said that they were actually assessed either once or twice by only one or two supervisors.

While for diploma student teachers the criteria for assessing them remained vague and confidential, as there was no common check list of what was assessed, assessment of university-based student teachers was based on a standard check list of seventeen abilities, personal factors and additional comments for the assessor. The rating scale was as follows: A = 10-7; B+ = 6; B = 5; C = 4; D = 3; and E = 2-0. A supervisor simply encircled "the right numeral." The following is a list of those abilities and personal characteristics:

I. LESSON PREPARATION

1. Ability in setting up objectives clearly and appropriately.

2. Ability in selecting materials, relevant examples and resource materials appropriate to the level of class.

3. Ability in selecting appropriate teaching aids.

4. Ability to relate the lesson plan to the overall objectives and structure of the scheme of work and the syllabus.

II. PERFORMANCE

5. Ability to arouse and sustain interest during the lesson.

6. Ability to relate one part of the lesson to another.

7. Ability to use the blackboard and other teaching aids.

8. Ability to promote full participation of all the students through group work or other procedures.

9. Ability to arouse and handle student questions.

10. Attitude towards students (e.g. courteous, helpful, etc.).

11. Speaking and communication skills (competence, loudness, clarity, lucidity, articulation, appropriateness, etc.).

12. Ability to use both recall and thought provoking questions.

13. Ability to engage students in critical thinking and problem-solving.

14. Ability to promote cooperation and self confidence among students.

15. Demonstrated mastery of the subject matter.

16. Ability to follow up the objectives of the lesson.

17. Ability to devise and use an adequate variety of procedures to evaluate progress in all of the objectives of the lesson.

III. PERSONAL FACTORS

18. Observed factors, such as general appearance, confidence, mannerism, teacher-student relationship, class management, etc.

When those teachers who said they were given some feedback were asked to give examples of assessor's comments, verbal or written, these comments were similar to the "abilities" included in the list above. For example, some of the comments cited were about the use of teaching aids and the blackboard: "The legibility of your handwriting needs to be improved. I couldn't read what you wrote from the back of the classroom." "Your teaching aid was too small and irrelevant to the lesson objective." Other comments dealt with such things as voice, mannerisms; command of subject matter; content organization; use of time; involvement of pupils and instructional evaluation and pupils' discipline and classroom control. Although "Ability to engage students in critical thinking and problem solving" was one of the abilities assessed in teaching practice of undergraduate students, none of the university graduate teachers cited it as a teaching competence that was emphasized in assessors' comments. It was an ability perceived neither by tutors nor by teachers. The inclusion of only these two inquiry elements in this list also reveals to some extent how an inquiring mind was perceived by teacher educators from this institution. The "abilities" included in this list are also similar to the list of technical skills which teachers cited as having been taught to them in methodology lectures.

A crucial observation noted by the majority of participants was that the primary purpose of conducting teaching practice was summative rather than formative. They believed that the assessment was essentially meant to enable teacher educators to get scores upon which students would be graded in the final examinations rather than help them improve their teaching. "It is the grade that counts and not the genuine desire to enable student teachers to become better teachers who can foster an inquiring mind effectively," a tutor commented. Teachers also said that, as student teachers, what mattered most was a grade rather than learning how to teach well. To achieve the good grade, they said, teacher students developed *survival tactics* of getting better grades such as reteaching topics they had well rehearsed in advance, and using unique teaching aids to impress the supervisors. Here, too, the power of examinations influenced greatly the purpose and direction of teaching practice. Pressure to receive favorable evaluations from supervisors and pass well and to get through the immediate experience of student teaching made student teachers view teaching practice as a survival-oriented activity rather than as a way to develop their professional abilities. Such survival-oriented concerns of student teachers have also been observed by Zeichner and Teitelbaum (1982).

Linear thinking which assumes separation of theory from practice is another characteristic of the conduct of teaching practice in all Tanzanian educational institutions. Teaching practice was sequenced in all teacher education programs on the assumption that *theory always informs practice*. This belief may explain why teaching practice came at the end of a year in which it was conducted. Consequently, student teachers did not have early and frequent contact with pupils in actual classroom setting. Teaching practice was not built into teacher education programs as a continuous approach to prepare inquiry-oriented teachers.

Current changes in the university-based teaching practice (University of Dar-es-Salaam, 1992) seem to aim at solving some of the problems discussed in this section. The time for teaching practice has been increased from 8 weeks to 24 weeks and, instead of being done once during the second year, it will be done three times as follows and serve the following purposes:

(1) **First Year Teaching Practice** will take 8 weeks. "During the first two weeks there will be an orientation program to teaching, and will expose students to the fundamentals of teaching in the broadest term of the profession. The remaining 6 weeks will be spent in the field where students will be stationed at institutions of their specializations in year two" (p. 91). "The purpose of first year teaching practice is to expose students to real educational environment both classroom and out-of classroom, where they will be expected to apply the simple teaching skills obtained at the University and solve everyday problems by utilizing the theories gained from first year courses" (p. 92).

(2) **Second Year Teaching Practice** will run for 8 weeks and students will go back to institutions of their specialization "and will do classroom teaching based on the theories and principles of curriculum development, educational media and technology, as well as the methods courses. This will be an experience for them to study thoroughly the respective syllabi, and adopt or adapt them in accordance with classroom needs" (p. 92). Note here how teacher education is closely oriented and tied to existing prescribed curricula.

(3) **Third Year Teaching Practice** will also take 8 weeks, and the emphasis "will be on competence in teaching the specialized subjects by demonstrating the required professional skills in the preparation, presentation and organization of lessons, in the selection, operation and use of teaching aids, and in identifying and dealing with learning difficulties experienced by pupils and students in schools and colleges" (p. 92). Note here the emphasis on tailoring teacher education to the dictates of academic rationalism.

During the first year of teaching practice, student teachers "will be assessed mainly by cooperating tutors coordinated by Faculty of Education tutors, as well as by Heads of institutions to which they are attached on a pass/fail basis" (p. 92). During the second and third years assessment will carry 50 marks, 40 for classroom teaching and 10 for reports on the experiences observed from a selection of a variety of educational issues; and both assignments will have to be passed at 16 and 4 marks respectively. "Second and third year teaching practices will be assessed by subject specialists" (p. 93).

Exhaustive analysis of these changes is not undertaken here, but emphasis on linear beliefs of theory informing practice and the metaphor of teaching as *applied science*, in which theories and principles lectured in "academicized" education are seen as unproblematic are vividly revealed in the above pronouncements of the Faculty. Emphasis on summative evaluation and subject "expert" or "specialist" assessment, and absolute lack of student involvement in this process, a situation likely to perpetuate survival attitudes

among student teachers, can also be noticed from these arrangements. The tone of academic rationalism is also evident. Under such circumstances, student reports are likely to be uncritical of the taught theories and principles and the status quo, but continue to be taken for granted and as absolute givens.

Single Lesson Teaching Practice

The diploma syllabus for geography methods, and presumably for other subjects, included "Single Lesson Teaching Practice" (SLTP). This day-to-day teaching practice is used as an instructional approach by teacher educators whereby each student teacher is required to teach at least one period per week in a school near to the college. For this reason, each teachers college in Tanzania has a practicing primary school attached to it. Diploma student teachers could teach in a primary or secondary school or a teachers college preparing Grade "B" or "A" teachers. During my time as a Grade "A" student teacher at Mpwapwa teachers college, we did a lot of this kind of teaching practice in both primary and secondary schools. Student teachers would be assessed not only by tutors but also by their colleagues. Back at college students in small groups would discuss and reflect on their own teaching and make suggestions about how it would be improved. In short, this model of supportive reflective practice was one in which students themselves reflected critically on their own teaching and learned better teaching from day-to-day practice. It was continuous teaching practice built into the program throughout the teacher education course. By the time students did their BTP they were already conversant with basic issues and concerns in teaching and learning.

When teacher and tutor participants were asked to comment about the usefulness of SLTP in preparing them to develop an inquiring mind, they said that they did not do such teaching practice. Tutors at Dar-es-Salaam teachers college reported absence of this kind of teaching practice for diploma student teachers. Thus, SLTP, which had enabled continuous and early contact of student teachers with pupils and their gradual growth professionally, and had provided the bridge between the college and the school and thus helped to close the gap between theory and practice, had died out, though it was still listed in the syllabus.

Interpretation and Operationalization of the Concept of An Inquiring Mind in Education Programs

To find out the extent to which the concept of an inquiring mind was being interpreted and operationalized in education courses at both levels of teacher education, teacher and tutor participants were asked to respond to the following question: *To what extent were you engaged in the interpretation and operationalization of the concept of an inquiring mind in education courses?* The responses by teachers and tutors revealed that the policy of ESR was *hardly being read and interpreted* in order to understand its key educational demands in general and to foster an inquiring mind in particular. These participants said that there was absence of discourse on this inquiry goal and its development at both levels of teacher education institutions just as was the case with secondary schools. Tutors said that the concept of an inquiring mind was a non-issue possibly because it was not included *explicitly* in the school and teacher education curricula as a key element to be emphasized in teaching and learning. As a result the concept remained obscure, hazy, and peripheral to the conaciousness of educators and policy makers. This intransparency of an inquiring mind must have been exacerbated by the effects of the ethos of academic rationalism.

Gearing Preservice Teacher Education to School Curricula

A senior official participant from the Department of Secondary Education at MOEC's headquarters revealed that one reason for emphasizing academic content in secondary teacher education curricula was to enable teachers to teach a discipline-oriented secondary school syllabus. The intent of the course was to establish a common philosophical and psychological ground and harmony between school and teacher education programs. Indeed all existing teacher education and school curricula revealed this fit between them. Consequently, as one participant said, "this limits teacher educators to orient their programs towards helping their students to develop an inquiring mind. The materials included in those syllabi are written in such a way that they encourage coverage and lecture method, and thus impose a limit to which teacher education can be oriented to the development of an inquiring mind." Both teacher education and school curricula were *content-focused* rather than *process-focused*. As a result, neither curriculum was intended to help the learner to reflect critically on the content they learned but accept it as absolute truth and unproblematic.

Standard of Education

A number of administrator interviewees believed that a strong academic orientation in teacher education curricula was an indication of guarantee for high standards of education in the country. They believed that the more academic the program was the higher its standards became. This assumption underlies one administrator's response cited earlier that the adoption of "social studies" and "integrated science" programs would "water down" educational standards in Tanzania. While discussing with them the World Bank's (1990) report regarding the Bank's benchmarks to improve science teaching in the country, these officials expressed the belief that integrated science, like social studies, was for "weak" students because the program was of low standard academically, which means that such curricula were not based purely on traditional disciplines.

The World Bank concurred with this stance and the assumption that disciplined programs were superior and for the "bright" and "able" students when it suggested that "Selected schools with proven high academic standards would continue to offer the separate science curriculum for secondary schools" (World Bank, 1990, p. 33). Academic rationalistic beliefs such as these only help to marginalize, if not eliminate completely, the possibility to think about and appreciate the significance of fostering an inquiring mind in the educational system. The preoccupation becomes teaching and learning the established givens and the measurables and not genuine issues and problems.

Gearing Diploma Programs to University Entry Qualifications

Diploma teacher education programs were also overdosed with the discipline-orientation with the expectation that the graduates of the program who wished to upgrade to degree level would be admitted to the undergraduate program in the Faculty of Education on the basis of their academic performance at the diploma level. This is another instance of trying to establish a fit of academic tradition between the two programs. Gearing diploma programs to the needs of university entry qualifications was another reason for introducing A-level national examinations for academic subjects at this level. Indeed, this move has been one of the major ways for diploma teachers to upgrade to degree level, although at the same time it has siphoned the best teachers from the primary school system. Emphasis on passing academic subjects for this purpose, however, has at the same time deflected and "derailed" educators' and policy makers' minds from being aware of and focusing their attentions on the designing of teacher education and school curricula that would foster an inquiring mind.

The *backwash effect* of this academic fit between diploma and university programs for the purpose of gaining entry qualifications to the latter is an amplification of a long-standing contradiction common in university-based teacher education programs - a tension between the university's academic ideal of doing research and teaching knowledge for the sake of pure scholarship, and the school's goal of teaching and learning knowledge for "praxis" purposes whereby the mutual interaction between theory and practice must be valued and utilized. Failure to resolve this contradiction must have escalated the emphasis on mere theoretical teaching and learning in both teacher education and school systems.

Hierarchy of Status of Subjects

Although fine and theater arts and music were taught at the university level and were among the teaching subjects in secondary schools, they were being taught mainly by teachers who held a non-diploma and non-degree *certificate* in teaching these subjects. There was no preservice teachers course in this field at the diploma level, and these subjects were not examined at A-level except for private candidates. Grade "B" and "A" teachers who upgraded to certificate in fine and theater arts at Butimba teachers college were not recognized as diploma holders although they taught in secondary schools and teachers colleges. In fact a number of heads of schools believed that these teachers were incompetent to teach in such institutions and proposed to have them posted to primary schools. The major problem was that they had not majored in those highly valued disciplines which are gates to big salaries and high social status.

The Crash Program Tradition

Preservice programs at all levels of teacher education in Tanzania have, since independence, been characterized by the tradition of designing "crash programs" aimed at preparing as many teachers as possible in a short time with less cost involved. For all teacher education programs, time for preparing teachers was reduced in different periods by one to two years. In some programs this amounted to 50 percent reduction of preparation time while the scope of program content remained almost or virtually the same. As a result, there has been too much breadth and depth of content, resulting in overcrowded curricula; hasty and superficial coverage of the programs; and artificial or complete lack of understanding of the concepts and principles so taught and learned. Indeed, teachers and tutors admitted to have acquired partial understanding of much of the content they were taught in teacher education institutions due to too much depth and breadth.

When the one-year conventional diploma program was made a two-year program, part of this time was spent doing national military service, and effective teaching time amounted to only one year as before. The two-year upgrading diploma program was in actual fact supposed to be a four-year program - two years of A-level in academic subjects and two years of diploma in education. Both components were reduced by half of the time to one year each, without reducing the program content. Tutors at Dar-es-Salaam teachers college estimated that when time for teaching practice, sitting for examinations, and that lost through other ways was taken into account, effective teaching time amounted to about five instead of eight months in each academic year. In theory, the three-year Mkwawa type of program was also supposed to take four years, one more year being for professional preparation. However, this program was squeezed in a third year which also amounted to five months or less of effective teaching time. University graduate teachers who, before 1967, used to undergo a full year of a pedagogical post-graduate diploma in education, after completing their three-year academic program, were from 1968 being prepared through a three year sandwiched academic and professional crash program. Later the fourth year program was reduced to only one term. The full fourth year was then seen as "a waste of valuable time" (Department of Education, 1986).

The pressure to cover extensive content in a very short time in order to pass national examinations at diploma level led not only to superficial teaching, resorting to mere lecturing, blind copying of information and rote memorization, but also skipping other topics and using "sampling" methods such as those used by secondary school teachers to select and teach the content that was most likely to be tested. The effect of crash programs was thus to gear diploma programs to national examinations. Tutor and teacher participants said that the major preoccupation of tutors and student teachers was to pass national examinations and nothing else. Consequently, student teachers resented doing activities involving searching for information and discussing issues which they perceived as unrelated to national examinations which, if passed with high grades would get them into undergraduate programs. Graduate teachers, too, said that their programs were loaded with content and studied mainly for passing examinations rather than developing their inquiry abilities. A graduate teacher had this to say:

> At the University as well, too much content was taught within a short time. Students were working like machines. There was too much information lectured, and we could only produce it in examinations without digesting it. There was no way one could avoid memorizing most of what was lectured as examinations were very decisive in one's life, and too demanding as well. Creativity and the like were not very important.

A professor interviewee also found that although university examinations were being set by professors themselves they were of "regurgitation" type: "Our examinations ask our students about how much they can regurgitate from lectures. It is we professors who write these examinations. Yet these examinations test facts pumped into our student teachers' heads by lecturing a lot of information within a short time." Tutors at Dar-es-Salaam teachers college believed that, besides the crash programs inducing pressure cooker type of teacher education, these programs were crashing them as well. Of course, the reasons given by the policy makers for reducing the time for teacher education - including "scarcity of teachers" and "reducing a waste of time" were a rationalization based more on political expediency than on professional need and interest to prepare a teacher able to foster an inquiring mind. It remains to be seen whether or not a four year undergraduate program will produce inquiry-oriented teachers and teacher educators.

Duplication of Content

Time and other resources would have been saved and used more meaningfully had teacher education programs at diploma level not duplicated content unnecessarily. Teachers who went through a non-Mkwawa model said they had to study East Africa, Africa, and Asia (China and Japan) most of which was a repetition of what they had studied at A-level. Some teachers also found that there was a duplication of content within A-level and diploma geography syllabi. Vertical organization of a course on the methods of teaching according to each teaching discipline also resulted in duplication of content and resources.

Curriculum Revision and Authenticity of Sources of Program Content

An analysis of prescribed textbooks and reference books listed in both education and geography syllabi for the diploma course reveal that some sources were outdated. This problem was mainly due to the fact that both syllabi had been compiled in 1980, and they had not been revised since. The books prescribed in both syllabi were published between 1950 and 1980 (Ministry of Education, 1980; 1982). Table 5 shows that 85 percent of the books were published between 1950 and 1974, 14 percent between 1975 and 1979, only 1 percent between 1980 and 1984, and none beyond that period. This gave rise to at least two

major problems. First, most of these books were no longer available in the local and foreign markets. Second, some of the materials in those books were outdated and thus irrelevant to the current situation. Books written by ICD have been criticized for having drawn outdated content from such references.

Table 5: Dates of Publication of Books Prescribed for Use in Education and Geography Diploma Programs

Year of Publication	No of Educ. Books	No of Geog Books	Total No. of Books	Percentage
1950-1954	3	2	5	3
1955-1959	11	1	12	8
1960-1964	15	5	20	13
1965-1969	26	16	42	28
1970-1974	25	26	51	33
1975-1979	13	8	21	14
1980-1984	1	1	2	1
Total	94	59	153	100

In the past, before curriculum for teacher education at diploma and certificate levels were made the responsibility of the ICD, teacher education curricula were written by tutors themselves. A teachers college was chosen to oversee the development and revision of a certain subject curriculum. Katoke teachers college, for example, oversaw the development of geography syllabus and its teaching. The head of the geography department became the organizer and chair of the workshops that did this work and a geography tutor from each teachers college would participate. There were similar micro-workshops at each college before a final one which pooled together the contributions of all colleges. As the head of geography department at Katoke teachers college between 1971-1972, I organized two such workshops and they were very productive. They enabled tutors to learn some aspects of curriculum development process as they taught, and offered a kind of college-based curriculum development as well as an inservice course because curriculum developers, inspectors and other officials participated as resource persons rather than as imposers of their ideas. With the current purely centralized, top-down, installing mode of curriculum development process, it has become impossible for tutors from different teachers colleges to collaborate and learn from one another. Like teachers, teacher educators have suffered professional isolation and alienation, a situation that exacerbates the culture of conservative individualism.

TEACHERS' AND PUPILS' VIEWS OF A GOOD TEACHER

To capture what teachers and pupils believed a "good" teacher was or should be according to their frames of reference, they were asked to respond to the following Teacher question: *What characteristics, qualities and abilities do you think a typical outstanding teacher should have?* It was hoped that the characteristics and qualities so generated would help reveal some aspects of the educational paradigms and ethos underlying Tanzanian teacher education and school curricula.

Teachers' responses were grouped into four categories : those related to the planning of teaching, the preactive stage; those related to actual classroom transaction, the interactive stage; those related to activities done after classroom transaction, the postactive

stage; and the characteristics related to personal character traits. The responses are summarized in Figure 9.

Pupil participants cited the following characteristics, qualities, and abilities of a good or outstanding teacher:

- Loves pupils and is always near to them; talks to pupils in friendly manner; discusses things with pupils; is approachable, fair, humorous, kind and open- and warm-hearted;

- Helps pupils to solve their problems related to schooling and personal lives; works hard to help pupils understand and succeed; encourages and gives fair tests/examinations; gives fair and reasonable punishments.

- Fulfills his/her duties and responsibilities - teaches every lesson well, attends classes regularly and punctually; is accountable to his/her pupils and apologizes to the class when he/she does something wrong; respects himself/herself and others.

Some pupils who approached the question from the negative aspect said that they did not respect or like teachers who were punitive, cruel, harsh, or tough; who terrorized, humiliated, scorned, and ridiculed pupils; who were rude, pompous, lazy, and hypocritical; and those who overworked and exploited pupils because of their vested interests.

An examination of Figure 9 above reveals a close similarity to the assessment guide which was being used by the Faculty of Education to assess pupils' "abilities" or "competencies" expected to be demonstrated by a "model" teacher, tutor, or student teacher. An analysis of education and geography syllabi for the diploma course also reveals such a similarity. It may be concluded that these characteristics, abilities, and competencies suggest largely the dominance of competence-based, technical, positivistic paradigms in teacher education and teaching rather than those embracing an inquiry-based orientation. They emphasize the need to learn and demonstrate smoothly orchestrated behavioral routines in rather predictable classroom environments and an assumption that teaching is a mere technocratic, applied

Figure 9: Characteristics, Qualities and Abilities of a Good Teacher

I. PREACTIVE STAGE
- Making thorough preparation of each lesson.
- Doing every activity and assignment included in the lesson plan before having pupils to do it.
- Being able to write properly schemes of work, lesson plans and lesson notes
- Writing lesson objectives appropriately.

II. INTERACTIVE STAGE
- Demonstrating mastery of the subject matter: commanding the knowledge of subject matter/teaching subject.
- Demonstrating mastery of teaching methods/skills: applying appropriate teaching methods to the content/subject matter; applying a variety of teaching strategies and techniques; using challenging questions.
- Using teaching aids including the chalkboard, and various examples.
- Communicating fluently, clearly, and systematically; using legible handwriting; good voice and appropriate body language.
- Motivating students by involving them in various activities; helping individual pupils by attending to their individual problems and needs; monitoring their learning to check for understanding; arousing and maintaining their interest throughout the lesson.
- Classroom management: managing the class so as to maintain discipline, order and attention/making pupils listen attentively; cultivating good behaviors/manners of the pupils; having pupils respect one another and adults/their seniors.
- Evaluating: giving adequate and appropriate assignments/homework; providing feedback.

III. POSTACTIVE STAGE
- Giving adequate and appropriate assignments/homework; providing feedback.
- Helping students to pass tests and examinations; out-of-class coaching/ tuition.
- Enforcing school rules and maintaining discipline outside the classroom.

IV. PERSONAL CHARACTER TRAITS
- Being a "friend of pupils" and a "caring parent," loving, approachable, humorous, understanding, democratic, cooperative, kind, patient, fair, reliable, respectable, punctual, dedicated, patriotic, a model of good citizenry and leadership behavior, confident, and respectable.
- Being tidy, clean, smart, healthy, quick and having good mannerism.
- Valuing to strive for self-advancement in academic and professional fields and matters.

science. This stance embraces the notion that there is a ready-made basic knowledge which all teacher education institutions must teach and which all teachers must master and use efficiently and competently.

Figure 9, however, reveals another dimension in the thinking of teachers: although their responses suggest a technical paradigm, teachers did not view the entire business of teaching as purely technical and mechanistic matter devoid of *humaness*, or what is in Kiswahili would be called *"utu,"* (personness?) a derivation from the noun "mtu" (person). Figure 9 reveals that teachers felt that, although they needed technical skills, they also needed to have a human touch and behave and act in a humane manner: to be *friends of pupils and caring parents*, loving, approachable, humorous, fair, democratic, cooperative, confident, responsible, well behaving , and so on.

"To be human" was even a more pronounced feature of the responses given by pupils. Pupils suggested the need for a strong humanistic input into teaching and learning. Pupils wanted a teacher who, besides teaching every lesson well and competently, loves and cares for them, is approachable, humorous, kind and open- and warm-hearted; helps and respects them; is fair, democratic, non-punitive, patriotic, accountable, responsible, and so on. Thus, both teachers and pupils seem to suggest that the definition of a "good" teacher in terms of his or her *goodness* as a human and good citizen is not as archaic, moribund, and irrelevant as others would have us believe; they are indeed basic to teaching for the development of an inquiring mind.

In fact, the policy of ESR demanded that for teachers to develop an inquiring mind in their pupils, they had to love and care for their pupils just as they loved and cared for *their own* children: It is stated in this policy (Nyerere, 1968) that:

> The schools must, in fact, become communities - and communities which practice the precept of self-reliance. The teachers, workers, and pupils together must be the members of the social unit in the same way as parents, relatives and children are the family social unit. There must be the same kind of relationship between pupils and teachers within the school community as there is between children and parents in the village (p. 283).

The policy also stresses very strongly and vividly the cultivation and inculcation of democratic ethos and community spirit in teaching and learning.

It is very unfortunate that teacher education programs, like school ones, have hardly moved towards fostering the inquiry ethos in Tanzania's educational system. It can be noted that almost all characteristics, abilities, or competencies either planned or cited by the participants lack a clear focus on the development of an inquiring mind. "Critical thinking" and "problem-solving" are included in the university's assessment guide for teaching practice, but it was found that these inquiry elements were not being fostered either in schools or in teacher education institutions. Indeed, what was found dominant in the "lived" curriculum of a Tanzanian secondary school classroom was nothing else but typically authoritarian and authoritative teaching rooted in academic rationalism, and mainly an autocratic model (Meighan, 1988).

It is a good thing for teachers to take the role of "a loving and caring parent," yet Meighan includes in the "authoritarian teaching role-forms" a "parental" form of authoritarian teaching. This definition may serve as a reminder to educators that they may in fact stifle the development of an inquiring mind through exercising certain parental roles which are domineering and merely patronizing.

TEACHERS' VIEWS ABOUT THE CULTURE OF TEACHER EDUCATION INSTITUTIONS

To probe specifically into the culture of teacher education institutions in relation to the development of an inquiring mind teachers and tutors were requested to respond to the question: *To what extent do you think the cultural context of your teacher education institution affected your understanding and ability to foster an inquiring mind?* More specific questions probed into the beliefs, values, and behaviors which were commonly held by teacher educators in a teacher education institution about the preparation of teachers. Some of these questions were: Did teacher educators have a clear philosophy of their own about teaching and learning? How was that ethos communicated to student teachers? How did that ethos influence student teachers' opportunity to develop their own inquiry abilities and how to foster an inquiring mind? Did teacher education institutions help student teachers develop their own philosophical views on teaching and learning?

Teachers from both levels of teacher education said that it was difficult to see teacher educators as a *group* sharing common values, purposes, or beliefs on teacher education. The only things that bound them together were a common official curriculum and physical space in terms of sharing offices and the like, but not a common vision of their own on the type of a teacher they aspired to prepare as a group. The major concern of teacher educators was to teach the curriculum as given, and enable as many students as possible to pass the final national examination.

Diploma teachers said that tutors and college principals tended to very closely adhere to what the government and politicians believed constituted good teacher and good teaching, particularly as enshrined in key official records such as the Code of Professional Conduct (Ministry of Education, 1984b), guidelines for the management of teachers colleges, NECTA's evaluation guidelines, and other MOEC's and CCM's official documents. This was also true of the university's teacher education programs, but the Faculty enjoyed more autonomy in deciding what and how to teach than teachers colleges. In other words, the model of the good teacher and good teaching was prescribed from above and installed directly into teacher education institutions. Like school teachers, teacher educators were expected to simply follow the top-down philosophies imposed from above officially and academically by "philosophy specialists" rather than reflecting on and critically appraising those philosophies and developing or experimenting on their own. Educators and student teachers were expected not to critically question the given philosophies and policies, but simply to follow them as blind implementors, whether those installed ideas were flawed or antithetical to appropriate intents such as the development of an inquiring mind.

Here, too, the principles and practices of the polity and governance conflicted sharply with the intent to develop an inquiring mind. The general impression of participants was that teacher education at both levels was intended to produce academic subject specialists who were able to deliver effectively funded knowledge from established academic disciplines according to given philosophies rather than prepare educators grounded in issues, competencies, and dispositions of an inquiring mind and exploration of possibilities to design a pedagogy that would facilitate the fostering of this goal. Teachers admitted that they lacked philosophical bases or views of their own which they could articulate in relation to teaching and learning or to curriculum issues.

CANDIDATES ENTERING TEACHER EDUCATION

Qualifications

Recruitment of teachers and selection of prospective student teachers was a concern expressed by a number of participants, particularly teacher educators, heads of schools, and some other administrators. It was found that both the *official* minimum academic requirements for the preservice programs and the *actual* specific entry academic qualifications held by the students who were being admitted to the program were typically low, minimal, and too inadequate to recruit the most promising teaching talent. This finding applied to both university-based and college-based teacher education, but it tended to be a more serious problem at the diploma level.

For a social science student to get into the diploma program after Advanced Certificate of Secondary Education Examination (ACSEE), he or she needed one minimal principal pass and one subsidiary pass of an approved subject. For science students, the minimum qualifications included three subsidiary passes, two of which were to be principal science subjects. (Principal passes included A = 5, B, = 4, C = 3, D = 2, and E = 1; Subsidiary pass, S = 0.5 and F = 0). Upgrader and Mkwawa model candidates entered the program with some passes at O-level including one or more credits in some subjects.

At the university level (University of Dar-es-Salaam, 1987; 1992) the minimum entrance requirements for education candidates were basically the same as those in other courses and included:

(A) Certificate of Secondary Education Examination (CSEE) or equivalent with passes in five approved subjects, obtained prior to the sitting of the Advanced Certificate of Secondary Education Examination (ACSEE) or equivalent; AND

(B) One of the following combinations of passes in the A-level examination or equivalent:

(i) Two Principal Level passes (in appropriate subjects) at the same sitting. In the 1992/93 prospectus students seeking admission for B.Sc. Education require total points not below 3.5 and 4 points for other degree courses; OR

(ii) Two Principal Level passes (in appropriate subjects) not at the same sitting provided they are both of grade C or higher; OR

(iii) An appropriate equivalent Diploma/Certificate with credit or higher grade.

Besides the direct entrance qualifications, there was the Mature Age Scheme for some mature age candidates who were 25 years of age or older and had done Form IV Examination and obtained at least 3 credits in approved subjects or attended Form VI, at least 5 years after passing those examinations, had attended extra-mural classes or residential courses, had passed university qualifying tests, and possessed favorable recommendations from the employers. (University of Dar-es-Salaam, 1992, p. 13).

The problem, however, was that when there were fewer candidates who met these minimum qualifications than the targeted intake for a particular year these requirements were *lowered*, and sometimes substantially, in order to attract the required number of candidates. As it can be noted above, shortage of science candidates has forced the university to lower entry points for science candidates to 3.5. Problems of recruitment of best candidates and teachers were being exacerbated by various factors including

competition from high schools, more lucrative, and more prestigious professions, and private entrepreneurship. The low prestige accorded the teaching profession by society, low salary levels and fringe benefits, and unattractive working and living conditions were among the factors that determined who went into teaching. The quality of candidates for teaching was thus largely determined by some factors beyond the control of recruiting authorities. Lowering of minimum entrance qualifications was being induced by the increasing shortage of teachers which was partly in turn the result of ambitious expansion of secondary sector, both public and private. All these factors played in such a way that the teaching profession received students who constituted the last layer in academic performance, the top "cream" having been selected to join what were regarded as "high-status" professions and courses. This practice itself contributed to the lowering of the status of the teaching profession and prevalence of negative attitudes towards teaching.

Interest

Pupil participants were asked if they would choose teaching as their first choice of their future career. Only two of them said they would choose teaching as their first choice, and only one said would choose it but not as first choice. The other ten pupils said they would not choose teaching as their future career, and one declined to comment. Heads of schools and officials at MOEC headquarters reported that it was a common practice for most secondary school pupils not to choose teaching as their first or even second choice, and that, due to shortage of teachers even pupils who had not indicated that were interested in teaching were being selected for teaching. It seems that teaching was being selected as a career of last resort. Indeed, some teacher participants said they were forced to join the teaching profession.

The factors that reduce the status of the teaching profession seem to have a negative hidden curriculum for the pupils with regard to their preference for teaching. Those factors instill into the pupils a negative attitude towards the teaching profession. Given such an early rejection of teaching by most pupils, it seems that Tanzanian society needs to rethink very seriously the ways of motivating teachers and prospective student teachers so that the profession becomes more attractive and respectable. What was obvious was that teacher educators, themselves poorly motivated, were working with equally poorly motivated student teachers who were entering the profession as a last resort or using it as a *transit* to other greener pastures. From the beginning such students have no genuine love for teaching pupils or interest to understand and empathize with children; consequently they are neither very effective nor happy in their work. They treat teaching as a *survival* activity which they join by being forced by lack of alternative "life chances." It is doubtful if such teachers can spend their time and effort to seriously explore the possibilities of fostering an inquiring mind.

INSERVICE TEACHER EDUCATION

One assumption in this study was that if the Tanzanian education system was pivoted on the inquiry culture then secondary school teachers would be undertaking continuous activities and projects that were intended to help them understand and foster an inquiring mind. The MOEC and its parastatal and other organizations would be collaborating to involve teachers in seminars, workshops, conferences and other professional forums for this purpose.

To find out the extent to which such a scenario existed, teachers and tutors were asked to respond to the following three questions. *(1) Which inservice courses did you attend aimed at enabling you to understand the concept of an inquiring mind and how to develop it? (2) Describe the activities or projects you have been involved in intended to*

promote your understanding of the concept of an inquiring mind and how to foster it? (3) What are the problems involved in the development and implementation of inservice teacher education programs? Each of these questions consisted of more specific questions which probed for details. Other participants, particularly teacher educators, heads of schools and MOEC officials were asked to comment on issues and problems related to inservice education for secondary school teachers.

The Concept of Inservice Teacher Education

Two views of inservice teacher education were held by various participants: *orientation* and *upgrading*. When the majority of interviewees reacted to inservice education issues, they had in mind orientation inservice activities which were intended to *orient* them to new school programs, help them gain confidence in handling the syllabi and teaching materials, or learn new techniques of teaching certain kinds of knowledge in the syllabus. For instance, an official participant reported that the MOEC had "launched a program called Teacher Text Technology Initiative (TTTI) intended to give inservice seminars to secondary school teachers and college tutors in various subjects, particularly sciences, on the use of the environment to teach what is in the textbooks or in the syllabi, and to make teaching aid from locally available materials." Other courses of this kind at secondary school and college levels included a language program called English Language Support Project (ELSP) which was being supported by the British Council. Many teachers who had upgraded from primary level teaching cited MTUU inservice program (Tanzania UNESCO/UNICEF Program) which was meant for primary school teachers. Only a few administrators viewed upgrading programs as a component of inservice teacher education. The discussion that follows explores further these "gun-shot" type of short inservice courses as the upgrading ones have already been dealt with.

Provision of Inservice Teacher Education

"None," "do not exist/non-existent," "unheard of," "lacking," "nothing has been happening for years," "we have been left to rot professionally," "teaching means academic and professional bankruptcy" and "teachers have no opportunity to brush up their minds and get new ideas" were among the verbatim statements articulated by teachers and other participants to express unavailability of inservice teacher education programs in secondary education system. Almost all teacher participants said that they had not attended any short inservice course since they started teaching. Only one graduate teacher said she had attended a one-week workshop on environmental education. A headmaster wondered why "inservice teacher education is not a priority while it is a common knowledge that the quality of most teachers graduating from our teacher education institutions leaves much to be desired." "The real problem," a teacher observed, "is the absence of the awareness on the part of key decision makers, of the crucial role inservice teacher education plays in an educational system."

An official from the Department of Secondary Education said that inservice teacher education programs disappeared for a long time at the secondary school level since the late 1960s. When they were brought back in 1985, there was no policy about how inservice teacher education would be organized and progress. The courses continued to be "gun-shot" type, occasionally conducted for one or two weeks and reaching only a handful of teachers. "The magnitude of inservice courses is very small indeed as they benefit *less than one percent* of the total teaching force a year in the whole country," an official observed. An inspector participant said, "What is sometimes done when funds are available is that fifteen to twenty teachers are collected at a given place, say for a week or so, and an elaboration is made by curriculum developers or whatever on what is usually thought to be hard or difficult parts of the syllabus." Such inservice courses not only involved extremely

few teachers at a given time, but were also very sporadic. The courses were based on "hit or miss" philosophy. Obviously, those teachers for whom inservice more often missed than hit the target could not be expected to be other than frustrated - and the majority for that matter. This frustration was expressed vividly by all teacher and tutor participants, and it may have been one reason which made some educators to quit the teaching profession.

A common reason that was given for lack of inservice courses by the officials responsible for organizing them was "shortage of funds." They claimed that funds earmarked for inservice teacher education were so few that allowed only a few courses to be mounted, and that sometimes no funds were allocated for this purpose. Other participants, however, found availability of funds not a main problem, but an attitude towards funding this kind of education. "Since some key decision makers in the government regard this education as rather unimportant, it is the one that is likely to suffer most in times of economic and financial crisis such as the one Tanzania is going through. Budgetary cuts for inservice education are easy in such times because they do not arouse public outcry on the quality of education and can be tolerated," an official explained. Another problem was that since there was no elaborate planning for provision of inservice education for secondary school teachers "most secondary school programs were launched into schools without teachers being ready to implement them," an official said. He cited an example of the Secondary Geography series - books I to III (books IV and V were being prepared) - which, he said, "was thrown into schools without the orientation of teachers." Of course, the "orientation" type of inservice education has been used in Tanzania as part of the top-down syllabus development and installation process which views "curriculum implementation as instrumental action" rather than "as situational praxis" (Aoki, 1983).

Multiplier Effect

Beneath the use of "gun-shot" inservice courses was an assumption of "transfer of training" and its "multiplier effect" held by key MOEC authorities, which convinced them that such courses would promote the professional development of teachers. An official responsible for coordinating inservice programs for secondary school teachers had the following to say :

> It is true that very few teachers get such courses and seminars. The sort of seminars or workshops that we tend to undertake are limited in terms of the number of teachers who attend them. We call few teachers per seminar with the idea that after they have undergone that workshop or seminar they will go and disseminate that knowledge or information given to them to the other teachers in schools. Even more recent seminars conducted for English teachers under the English Support Project, mathematics, and science teachers have not covered all subjects and all teachers in secondary schools. We do believe in using the *multiplier effect* in using this approach of inservice teacher education. We hold the view that these teachers will influence other teachers when they go back to their areas they come from.

This principle of multiplier effect seemed to be used as a rationale to justify the usefulness of such inservice teacher education courses. Unfortunately, the assumed transfer did not and could not take place because there were not any conditions at school and "class-roots" levels that would allow and facilitate exchange of ideas among teachers to take place. *School-based* inservice courses for teachers or *college-based* inservice programs for tutors were non-existent. They were not even perceived or suggested by any of the interviewed senior educational administrators. A former curriculum developer suggested a reason why school- and college-based inservice teacher education was absent in Tanzania:

> We can't do that because, first of all, we are centralized. The decentralization of curriculum has not taken place. We decentralized primary education in terms of administration only. The curriculum is still maintained by the central government. So there is no authority for schools and teachers in a school to carry on such activities as they find it fit. It is always the center which issues some directives for the periphery to implement. The system is highly centralized and as such we are not very democratic in terms of educational administration and supervision. Teachers receive orders from the center. They implement curricula according to those orders, not dialogue. They may be oriented somehow and that is all.

That school and college curricula were very highly centralized has been dealt with in earlier discussion. The control of inservice teacher education in Tanzania also remained in a tight grip of the central government and no plans were in place to make it a collaborative undertaking and responsibility shared by teachers and others at school level. Some officials were very enthusiastic and optimistic t' . the opening of the seven *teacher resource centers* under the Eighth IDA project (World Bank, 1990) would make the decentralization of teacher education possible. Whether or not this will be the case remains to be seen.

Hierarchy of Status of Subjects

There seemed to be greater preference and priority for provision of inservice courses to teachers teaching science subjects - chemistry, physics, biology and mathematics - and English than to teachers who were teaching other subjects, probably because of the government's emphasis on the development of science and technology in the country. This lopsided stance was depriving teachers teaching the social sciences, the humanities, and fine and theater arts the opportunity to access inservice education. When the coordinator of secondary education inservice programs was asked about the situation of inservice courses for social science teachers, he said:

> Now, we haven't had seminars on history, geography etc. for a long time .... But this year (1990) we have on our schedule plans to have zonal seminars for geography. That again will depend on the availability of funds. But of course history, geography, all the social science subjects have been de-emphasized in this regard.

An inspector of schools also made the same observation: "I have not for many years heard of such inservice courses for geography, history, and economics teachers. Hardly any at all," he said. The attitude of relegating social sciences and fine and theater arts and other subjects perceived as of "low status" to the secondary position in the provision of inservice programs and distribution of resources among subjects could also be noticed in the World Bank's report (World Bank, 1990). The effect of the euphoria for the transfer and development of science and technology to the teaching of the "other" subjects remains to be seen.

The Academic Tradition

When an official who coordinated secondary school inservice courses was asked to respond to the question: Do you remember any inservice program intended to explore the concept of an inquiring mind and possibilities to foster it?, he said:

> No. We haven't done that yet. And of course to do that would be the role of the Department of Teacher Education. This is because we the

> Secondary Education Department are essentially concerned with the *subjects* as such. So we cannot conduct seminars solely on the teaching approaches ... But, of course, whenever we conduct seminars always we reflect on the teaching approach but in view of the subject in question.

This response shows clearly what is regarded as the major role of the Department of Secondary Education: to have teachers teach "funded knowledge" of the academic disciplines. This goal is *not to teach pupils*. Pedagogy was not seen as a primary responsibility or priority of this department but a secondary issue. Its primary concern was to foster academic rationalism par excellence. Secondary school teachers and pupils had the same attitude as well. When asked whether they wanted to continue teaching and learning each discipline in isolation or adopt a "problem and issue oriented curriculum" in which content from various disciplines would be studied with a particular purpose of investigation, both teachers and pupils preferred the former. The reasons they gave for their choice included: "subjects are recognized internationally, so we can study them even abroad" and "employers will not recognize or accept certificates which do not show that you passed the subjects they require you to have." A graduate teacher participant wondered what pupils were going to inquire into geography as an established academic discipline: "What do you expect pupils to inquire about in geography? There is nothing to find out. Everything we need to teach them is available in books and other references. Why then pretend that pupils will discover and waste time for them?" These responses are a testimony to the fact that the ethos of academic rationalism had indeed entrenched itself very deeply in Tanzanian secondary school system. For both, teaching and teacher education at this level, what mattered was imparting disciplined knowledge, the *product of inquiry*, not the *process of inquiry* itself.

Methodology of Inservice Teacher Education

Some administrator and teacher educator participants who had conducted inservice courses agreed that besides inservices reaching too small a proportion of the total population of teachers to have any impact on effectiveness in the classroom, the courses offered were more of lecture and conference type than active involvement in which teachers modeled inquiry practice and collegial collaboration. They said teachers had attended courses only to come back confused about how to implement new ideas because theoretical lecturing on methods of teaching and teaching materials hardly helped them to internalize the significance of those ideas and how they would be used thoughtfully. Inservice courses emphasized mere technical competencies or skill as given and unproblematic. As with preservice programs, there was a *gap* between what teachers did during inservice courses and how they actually taught in schools. While inservice planned programs, like preservice ones, were largely based on technical, behaviorist model, serving teachers were traditional and autocratic in their practice, using lecturing, copy-copy and other passive, expository and depositing methods of teaching. These methods are best suited to imparting authoritative, disciplined knowledge.

Professional Support

A number of participants, particularly teachers, teacher educators and some officials expressed great concern about the lack of collegial and collaborative culture in Tanzanian secondary schools and teachers colleges. There was an utter absence of collegial support or peer coaching in professional matters either from among educators themselves within an institution or from professionals and practitioners outside it. The culture of conservative individualism that predominated the school and college ethos meant that teachers and tutors worked alone in individual classroom "cocoons" and hardly collaborated as peers to help

one another grow professionally through group action. This was so despite rhetoric on "cooperative endeavor," "collective leadership" and "democratic participation." An inspector of schools noted that "it is upon the teachers in the classrooms in secondary schools and teachers of teachers-to-be in teachers colleges to sit back individually and see if the way they are teaching is the way it should be done. If this is what *autonomy* should mean, in this case it does not support professional growth of our educators." This inspector was among the few officials who did not confuse between sham autonomy of teachers and tutors and the effect of conservative individualism induced by academic rationalism and "cellular organization" of schools and colleges (Lortie, 1975)

The problem of lack of professional support at school and college levels was even more serious for beginning teachers. Teacher as well as administrator interviewees including heads of schools reported that beginning teachers and tutors lacked guidance and support of any kind. "Many teachers beginning their careers are at a loss as to what to do, and how to do it properly. They are not given enough help by their peers or by teachers' guides which are supposed to help them. So they take a shortest way, that is, to teach the easy way of lecturing and giving notes," an inspector of schools commented. When asked to suggest the reasons why teachers lacked cooperation he said:

> I don't know why really. When I go to schools and ask teachers, they would say: "I have never thought of this before." But I say, "You have someone on the staff who has been here for six or so years," They say they are there. "Can you ask them to help?" The answer you would get is "Yes, I will try." But as a matter of fact they do not. I can't tell why; may be they are shy.

Indeed the explanation for this observation is difficult. But this problem is also a manifestation of the traditional separation of *preservice* from *inservice* teacher education, which seems to be based on the erroneous assumption that preservice teacher education is *complete* in itself and *terminal*. It is of course unrealistic to assume that the beginning teacher is a *final product*, however well-prepared for entry to the profession she or he may be. The pace of social change can only be expected to increase, thus putting even greater demands on teachers to sharpen their present teaching and inquiry skills, knowledge and dispositions and to develop a new world outlook. The current division between preservice and inservice teacher education may prove increasingly unproductive to maintain and we may do well to evolve a more *unified* and more flexible concept of "Teacher Education." It appears that to move towards this direction, school-based and college-based inservice teacher education which is inquiry-oriented will have to be emphasized as a central alternative to the current traditional "gun-shot" inservice approach.

One possible "growth pole" for teacher professionalism in Tanzania is the newly formed Tanzania Professional Teachers Association popularly known as CHAKIWATA. This association was initiated by the government of Tanzania as a response to the recommendations made by the Presidential Commission on Education in 1982. When an administrator participant who was an office holder in the association was asked to comment on CHAKIWATA's role in the fostering of an inquiring mind, he said:

> We haven't addressed this issue, and I think it is because this is a new organization and financially we are still incapable of convening the forums to discuss it.

The participants who reacted to the role of CHAKIWATA as a professional association of teachers believed that it was rather being managed as another MOEC's department at its headquarters or its parastatal organization such as ICD or NECTA. There

was nothing "professional" as yet about it. Although it had initiated a journal called The Tanzania Teacher, the articles in its publications had hardly reflected the participation of classroom teachers as among its key contributors.

SUMMARY

This chapter has attempted to assess teacher education factors which have influenced the fostering of an inquiring mind in Tanzania's secondary school system. Factors related to both preservice and inservice teacher education programs have been analyzed. Their total effect culminates in a basic finding that neither preservice teacher education programs nor inservice ones had succeeded to prepare an educator who was competent enough to develop an inquiring mind in Tanzanian secondary schools, and teacher education institutions. Noteworthy is the finding that the psychological, philosophical, political, and other factors which have tended to stifle the development and implementation of an inquiry-oriented curricula in secondary school system are mostly the same factors which have tended to hinder the designing and operationalizing inquiry-oriented curricula in teacher education institutions.

CHAPTER EIGHT

FACTORS RELATED TO EVALUATION

INTRODUCTION

While responding to the general question about the factors that have hindered developing an inquiring mind, all educator and administrator interviewees showed concern for the effects evaluation has had on the promotion of this goal at all levels of education in Tanzania. For this reason, evaluation is given much weight in this study. In this chapter, the focus of discussion is on the extent to which evaluation has influenced the development of an inquiring mind in Tanzanian secondary schools. A brief background to the evolution of Tanzania's evaluation system is first presented. The foregoing discussion only deals with evaluation in schools and teachers colleges which do the National Examinations Council's examinations. The university's evaluation system is not dealt with here, although it will be referred to in order to illustrate certain issues.

HISTORICAL BACKGROUND

According to Ndabi (1980), National Examinations in Tanzania came into existence in 1971, when it withdrew from the then East African Examinations Council (EAEC). Up to 1967, all major school leaving examinations were conducted by examining boards based in Britain. These boards included the University of Cambridge Local Examinations Syndicate, the University of London School Examinations Council, the Associated Examinations Boards; the City of Guilds of London Institute; the Royal Society of Arts (RSA), and a few others which concentrated on some specialized fields. Towards the end of 1967, the EAEC was established by an Act of the East African Legislative Assembly. It was enacted on behalf of the East African Common Services Organization (EACSO), which later became the East African Community (EAC). The EAEC conducted both O-level and A-level examinations in the three EAC countries, Tanzania, Kenya and Uganda. Other examinations, such as the RSA and the City and Guilds, continued to be conducted externally from Britain.

Following the decision by the Tanzanian Government to withdraw from the EAEC, the responsibility for running and conducting examinations at both the Primary and Secondary School levels were entrusted with the MOEC. Besides these examinations, the MOEC also took up responsibility for running Technical and Business examinations which formerly were conducted for the City and Guilds of London Institute and the RSA respectively. This new and challenging evaluation function was made the responsibility of the then Directorate of Curriculum Development and Examinations at the MOEC's headquarters.

The National Examinations Council of Tanzania

In December, 1973, an Act of Parliament Number 21, establishing the National Examinations Council of Tanzania (NECTA) was passed. The Act made NECTA the sole body which had to set and mark final examinations and award certificates for all school subjects. Under this mandate, the NECTA offered various examinations at primary, secondary, technical, business, non-formal and teacher education levels. At secondary school level the Council offers the National Form 2 Examinations (NF2E) in cooperation with the Inspectorate Department; the Certificate of Secondary Education Examinations (CSEE), and Advanced Certificate of Secondary Education Examination (ACSEE). The last two examinations are both *terminal* and *achievement* oriented.

The Council's Assessment Program

Beginning with the 1976 National Examinations, the evaluation of students' academic achievement has comprised of two components: the assessment of academic work and the assessment of character and attitudes towards work. The assessment principle underlying both modes of evaluating students' achievement was that a student's success or failure had to be decided on the basis of: (a) written examinations, (b) classroom performance, and (c) attitudes and performance in work oriented activities. The emphasis was placed on continuous assessment of student performance instead of relying on the mid and end-of-year written examinations as was practiced up to 1975. Thus, NECTA has been employing two types of assessment: Continuous Assessment (CA) and Final written Examinations (FE). Both methods were supposed to supplement each other in certifying candidates in their final years of schooling.

Continuous Assessment

Continuous assessment was incorporated in the National Examinations System in 1976, following a political directive issued by the National Executive Committee (NEC) of the then Tanganyika African National Union (TANU) ruling Party. The directive, better known as the "Musoma Directive, 1974" of Musoma Resolution, called for major changes in the examination system and stated as follows:

> We have to get rid of ambush type of examinations. At the moment, we are placing too much emphasis on written examinations ... Examinations should also enable us to find out whether a student has secured the type of education which will enable him to be of use to his village, or in whichever place he will be living after completing his studies ... The National Executive Committee therefore directs that the excessive emphasis now placed on written examinations must be reduced and that the students' progress in the classroom plus his performance of other functions and the work which he will do as part of his education must all be continuously assessed and the combined result is what should constitute his success or failure (NEC, TANU, 1974).

In actual fact, this critique of the evaluation system was an extension of the earlier more trenchant critique that had been made in the policy of ESR back in 1967. The policy called for the re-examination of the purpose of evaluation and the employment of alternative procedures of assessment as follows:

> Further, at the present time, our curriculum and syllabus are geared to the examinations set - only to a very limited extent does the reverse situation apply. A teacher who is trying to help his pupil, often studies the examination papers for past years and judges what questions are most likely to be asked next time; he then concentrates on teaching on these matters, knowing that by doing so he is giving his children the best chance of getting through to secondary school or university. And the examinations our children at present do, are themselves geared to an international standard and practice which has developed regardless of our particular problems and needs. What we need to do now is think first about the education we want to provide and when that thinking is completed, think about whether some form of examination is an appropriate way of closing an education phase. Then such an examination should be designed to fit the education which has been provided (Nyerere, 1968, p. 282).

The policy addressed this issue of evaluation further, with respect to the reorganization of the existing examination system. It said that "if pupils spend more of their time on learning to do practical work, and on contributing to their own upkeep and the development of the community, they will not be able to take the present level of examinations - at least within the same time period. It is, however, difficult to see why the present examination system should be regarded as sacrosanct" (Nyerere, 1968, p. 288). The policy suggested that school activities should not be "geared to the competitive examinations" and that "examinations have to be down-graded in government and public esteem" (Nyerere, 1968, p. 288), because "they generally assess a person's ability to learn facts and present them on demand within a time period. They do not always succeed in assessing a power to reason and they certainly do not assess character or willingness to serve" (Nyerere, 1968, p. 281). In response to the Musoma Directive, NECTA introduced Continuous Assessment (CA) in all secondary schools and teachers' colleges which, until January, 1990, carried out the three components of the program - projects, character assessment, and exercises and tests.

Tests

According to the new guidelines on the conducts and administration of continuous assessment in these educational institutions (National Examinations Council of Tanzania, 1991), "exercises and tests" component has been reduced to "tests" only, due to problems of administering numerous weekly exercises before that change. Now only a total of four tests were required for O-level secondary education and only three tests for teacher education and A-level secondary education. For O-level, the National Form 2 examination, which was administered at the end of the second term of Form 2 in Tanzania mainland, would count as part of CA. The other tests would consist of one terminal test at the end of each of the two terms of Form 3 and one terminal test at the end of the first term of Form 4. For teacher education and A-level three tests, students would do one terminal test at the end of each of the two terms of the first year of study and one terminal test at the end of the first term of the second year of study. All these tests would be prepared and administered by the subject teachers in schools and teachers' colleges.

Projects

Regarding the "projects" component of CA, students were required to do only one project at each educational level. In order to streamline the selection of topics for project work at the subject level, students would select one topic from any one of the following broad subject areas: (a) Arts and Social Sciences, (b) Physical Sciences, (c) Technical Subjects, (d) Agricultural Sciences, (e) Commercial Subjects, (f) Languages, and (g) Home Economics. Assessment of projects would be done in schools or teachers' colleges by subject teachers/tutors and would submit scores to the Council along with not more than three best students' projects selected from one of the above named broad subject areas. The role of the teachers in students' projects work would be to act as sources of information and guidance on all matters connected with the conduct of projects, including the marking of the projects themselves. Specifically, teachers would, among other things, help students to "(1) identify and delineate project themes or problems; (2) develop instruments for projects where this is necessary; (3) collect data, organize and analyze it; and (4) provide appropriate references, etc." (National Examinations Council of Tanzania, 1991, p. 11). To foster cooperative endeavor, students would undertake projects in groups of manageable sizes.

To redress the problem of the majority of students only doing "essay type" projects, the Council "recommended that teachers should acquaint their students with the following types of projects: (i) Investigative or theory oriented projects, (ii) Enquiry or

survey oriented projects, (iii) Causal-comparative projects, (iv) Creative projects, (v) Essay projects, (vi) Application oriented projects (National Examinations Council of Tanzania, 1991, pp. 16-17).

An analysis of these six types of projects is not made here, but they reveal a number of conceptual and philosophical problems. For instance, "enquiry" is equated with "survey" type of studies. "Creativity" is limited to "subjects like Music, Fine Arts, Sculpture and Literature, including Drama, Prose and Poetry." This list also reveals the predominance of positivist and rationalist thinking and culture of research. The document makes no suggestion for schools and teachers colleges to use methods of social inquiry. The basic method underlying these types of projects is the "scientific method."

According to these new guidelines, while tests would account for 45 percent in the final certification awards, the projects that were intended to develop an inquiring mind were to account for only 5 percent. Previously, exercises were awarded 20 percent, and tests 25 percent; thus, the new move did not lead to any change in the place accorded to projects in the national assessment system. In the final certification awards, CA carried a weight of fifty percent in each subject, while final written examination also carried a weight of fifty percent in the individual examinable subjects.

Character Assessment

Character assessment "seeks to measure behaviors such as attitudes and interest of learners which are less examinable under controlled conditions. It is concerned with the measurement of students' attributes in the affective domain" (Ndabi, 1986, p. 10). According to the Council's new assessment guidelines for secondary schools and teachers colleges, the concern would be to have assessments which were "as impartial and as less subjective as possible, to enable teachers and tutors to acquire similar conceptions of the attributes of students interests and attitudes and conduct the assessment as uniformly as possible" (National Examinations Council of Tanzania, 1991, p. 18). The objective is to "help schools and colleges to enhance the efficiency, reliability, validity, and relevance of the assessments (National Examinations Council of Tanzania, 1991, p (i)). The assessment would be made by each school or college and had to be carried out before registering students for their final national examinations. The following schedule was being used in assessing character in secondary schools (National Examinations Council of Tanzania), 1991, pp. 19-21):

901: **Diligence:** Conduct of applying effort with consistency, enthusiasm, perseverance, efficiency, and a productive, satisfactory amount of work.

102: **Valuing Work:** Conduct of showing interest in one's work, regardless of its nature.

103: **Caring for Property:** Conduct of applying care in handling property and of safeguarding it from loss or damage.

904: **Sociability:** Conduct of promoting social harmony and understanding; of showing appreciation and consideration of other people's viewpoints and feelings, and of being accommodating.

905: **Obedience:** Conduct of obeying lawful orders willingly and of following instructions faithfully.

906: **Cleanliness:** Conduct of being neat, orderly and tidy in appearance and presentation as well as caring for personal hygiene.

The schedule for assessing character of student teachers in teachers' colleges included diligence (905), obedience (906), honesty (907), and cleanliness (908) as in the case of secondary schools, but the other four character traits were different and included the following:

901: **Aptitude to the Teaching Profession:** Conduct of showing appreciation, interest in and commitment to dealing with children and/or other teaching duties in the teaching profession.

902: **Responsibility:** Conduct of being accountable or having a sense of duty as shown by regular attendance and punctuality to duties, as well as adherence to professional ethics.

903: **Cooperation:** Conduct of cooperating with others as shown by working well with others regardless of their rank or status, and accommodating others' interest and views (compare this with sociability above).

Each of these attributes was graded for each student as A=1, B=2, C=3, D=4, and F=5. A combined grade was obtained by adding all the points for the grades corresponding to the seven attributes, taking into account their respective weights. Finally, the total weighted score was converted in such a way that the overall award fell in three grades, namely, 1=very good; 2=good; and 3=poor. Grades 1 and 2 denoted a pass while grade 3 indicated fail. Heads of schools and colleges registered for national examinations only those students who passed in character assessment. The heads also had to notify those students who had been disqualified for registration on account of their having failed in character assessment. Before being assessed, students were to know how they were going to be assessed. Thus, character assessment determined whether or not a student qualified for being registered as a candidate for final national examinations. The assessment, however, did not affect the academic and continuous assessment scores that determined the quality of student certification.

Final Written Examinations

Final written examinations were being taken once every year by students completing Forms 4 and 6 in the case of secondary schools, and also at the conclusion of a teacher education course in the case of a teachers' college. All final examinations administered by NECTA were achievement in nature "in the sense that each test for a given academic subject represents a terminal evaluation of a students' status on the completion of secondary [teacher education] studies" (Ndabi, 1986, p. 8). All the phases involved in the development, conduct, and administration of final examinations were all centrally controlled by NECTA. These phases included setting and moderation of questions, printing of examination papers, parceling and mailing of examination papers to various centers, administering the examination, marking of worked scripts, and data processing and standardization of examination and continuous assessment scores. "Due to the sensitivity of examinations, setting and moderation activities are limited to a certain type of professional group. The activity is normally assigned to professionally qualified teachers with proven experience and integrity for handling examination matters. Such teachers may be drawn from the University, Secondary Schools, Colleges of Teacher Education, Technical Colleges and other post secondary institutions" (Ndabi, 1986, pp. 8-9). Examiners to mark examinations were also appointed by the Council and met in specific marking centers also chosen by NECTA. While at the marking center, the

marking panels prepared some descriptive statistics of the examination scores, which were submitted to the Council along with a detailed report from each chairperson. The report usually contained comments of examiners on each question and a general appraisal of the entire written examination in a specific academic subject.

This background is intended to provide the basis for uncovering and understanding the factors discussed in this chapter. The major sources of information include comments by various participants, documents, classroom observations, and my personal observations.

THE POWER OF EXAMINATIONS

All educator and administrator participants agreed that the long-standing problem of the educational system being geared to the examinations was still a pervasive problem, despite the reforms that had been made in Tanzania's evaluation system to redress the excessive emphasis on written examinations and tests. Some of the phrases used by various interviewees to express this concern were that the education system was "examination-oriented," "examination-driven," and "nothing else but geared to final examinations and certification." Other expressions were that "the major purpose of teaching in schools is not to teach or educate the pupils but to teach for passing examinations," that "a major problem with current examinations is their disproportionate power over the curriculum, to such an extent that teachers only teach examinable knowledge," and that "the main function of the school is to get as many final national examination passes as possible whatever the quality of those examinations is."

It was observed by several participants that since promotion from one level of schooling to another was still *very competitive*, national examinations figured extensively in the minds of students, teachers, and parents. Teachers and students tended to concentrate most of their effort and resources solely on preparing for final examinations. The power of the examinations compelled the teachers to focus their efforts to cover that content which was likely to be examined. Since the syllabi were too long and overcrowded with too many topics to be covered in too little time, with little connection between them, teachers were pressed to address these topics in a hasty and superficial way, conducive to rote memory teaching and learning. The most common way used by almost all teachers was to select the most important content and ignore the rest. The strategy teachers used to select the most important topics was exactly that one criticized in the ESR policy: teachers studied examination papers for past years and judged what questions were most likely to be asked next time, and then concentrated on teaching topics which were addressed in those questions. A teacher interviewee called this process "teaching by trend analysis of past papers," meaning that teachers analyzed the trend of the most examined topics by tracing the frequency of their occurrence over the years. Another strategy was to prepare *model answers* of the most frequent questions from past papers. The power of external national examinations therefore encouraged superficial coverage of content through copy-copy expository methods and learning by rote memorization of discrete information and teaching only examinable content. This meant lack of flexibility to depart from mere preoccupation with funded knowledge of academic discipline and thus alienating further learners and teachers from the realties of their community and depriving them of the opportunity to focus on inquiry-oriented teaching and learning.

Passing national examinations was very important for pupils and teachers, and the school as a whole. A teacher participant said:

> We are judged by the government, parents, and the society on the basis of the number of pupils we enable to pass these NECTA examinations. The more pupils pass, the more satisfied everyone becomes, no matter what they pass or how they pass it. So a teacher is seen as poor, lazy, or mindless of his or her duties, if his or her students did not pass those examinations or passed them with lower grades. Thus, if I were to spend time to develop my pupils' abilities to inquire, I and my school would show poor performance because all the content I could teach would be irrelevant to the intellectual demands of those national examinations.

External examinations were the number one source of motivation in matters of teaching and learning in all schools.

Besides teachers' strategies of "sampling" content to be examined and using model answers, external examination pressure was being manifested by the tendency of some teachers concentrating on "brighter" students. Student and teacher interviewees in some schools stated that better teachers tended to be channeled to "better" pupils who were also given the best attention and resources. Private tuition was being used by families to get their children better prepared for final examinations. Often school teachers acted as private "tutors," sometimes this interfering with their regular employment. The teaching of model answers of past papers was being exacerbated by the Council's publication and selling the past examination papers. In some cases, teachers mainly taught questions in those booklets and nothing else. There was also an emerging trend in some schools of teachers producing and selling to pupils "handouts" that contained model answers from the past papers compiled and published by NECTA. These "pass notes" "violated" the goal of downgrading written examinations in the educational system and encouraged learning by merely cramming model answers. The handouts also consisted of content copied blindly from the textbooks and private references, without presenting it in a manner that would encourage pupils to think about what they were reading and consulting other references. The publishing of past examination papers and teaching by model answers of these examinations defeated the purpose of developing an inquiring mind because these practices only helped to perpetuate passive teaching and learning. Drilling of model answers to students cannot help them to go beyond comprehension level at best and memorizing things without any understanding involved at worst. The Council's publication of past papers is a manifestation of the failure on the part of the examiners to think creatively about alternative ways and means of downgrading traditional national examinations and making the educational system less examination-driven.

The power of the external examinations was being also encouraged and reinforced by the practice of rewarding schools which were passing pupils highly in the national examinations by the MOE. Of course, the rewarding itself was well-intended, but its hidden curriculum was its tendency to reinforce the current primacy of anti-inquiry paper-and-pencil conventional examinations which still dominated Tanzanian educational system. The system was rewarding "wrong achievement." Pupils merely achieved the ability to memorize discrete facts, with very minimal or no effort to think, and regurgitate them upon signal rather than the ability to inquire.

THE ROLES OF EXAMINATIONS

The excessive power of examinations over the educational system is due to the fact that they have, for many complex reasons, taken on economic and social roles as well as educational. Indeed, the national examinations have, since the colonial days, served the

summative role of screening the candidates for further education and employment rather than *formative* role. Examinations of this kind, therefore, have little to do with assessment of learning, and a lot to do with allocating "life chances," to use Dore's (1976 p. 64) terminology. Consequently, the teaching-learning relationship has also served this purpose of evaluation. The heavy reliance upon external national examinations and traditional tests is the consequence of the economic and social context in which the Tanzanian educational system operates. Several aspects have determined this reliance on national examinations:

1. Limited educational opportunities for children to pursue their education beyond the primary stage and to move from secondary to higher education. This problem was exacerbated by the policy of restricting secondary school expansion in the 1970s, ailing economy and population increase with its consequent pressure on the allocation of available limited educational resources and opportunities.

2. Intense competition by school-leavers for a limited number of public and private sector employment opportunities.

3. Increased employment opportunities relating to the length of education experienced and examination passes possessed.

4. Starting wage or salary of a school-leaver in a job geared closely to examination success, whatever its definition.

5. Besides the academic pressure by the school (expectations of teachers and school administrators) and pupils' own desire to pass highly to meet conditions for being promoted to the next educational level and get employed, there are also community pressured or high social demand for pupils' success in national examinations. Employers, including the government itself, and higher education institutions wanted candidates who had passed highly, no matter what. They were only interested in certificates, whether genuine or fake, but not proof of their ability to conduct thoughtful inquiry and generate new ideas. The culmination was a heavy burden of national examinations that had to be passed as a gateway to success. The pressure extended on students at all levels of education meant that they could not do otherwise than learn by rote. This "pressure cooker" kind of education, however, does not put the need to develop an inquiring mind in the best position because it also "pressures" teachers to teach for passing examinations rather than devoting time to encourage students to inquire. Of course, "bright" pupils pass highly by memorizing things and get "A's" in these regurgitation examinations.

These factors have extended their influence to the classroom teaching and learning climate in the form of *intense competition* between pupils. Competition rather than collaboration and sharing dominated the instructional context in secondary schools. Some teachers and heads of schools said that teachers within a school and between schools were competing for better national examination results. They said that some teachers teaching the same subject or even topics within a subject competed for the same reason. Competition and thus lack of collaboration among neighboring schools was being undermined by the MOE's rewarding of the "best" schools. Some individual teachers also associated their promotions and other future prospects with their pupils' performance in national examinations. This association connects with earlier discussion on the hierarchy of status of disciplines: those subjects which were most valued were also vehicles for better prospects, not only for pupils, but also for teachers who struggled hard to ensure that their pupils passed examinations in those subjects, and therefore stood a better chance of being promoted. Some schools were known for passing many pupils in certain

"key" subjects, and parents who knew the rules of the game lobbied hard to have their children placed in those schools. And, of course, this tendency was another cause of corruption in the selection system. But these subject-centered influences further entrenched and cemented academic rationalism in the education system.

Intense competition induced by restricted opportunities to secondary education was being eased by the government's move to open more "community-based" day secondary schools. Some participants saw this measure as a positive step towards provision of the children an opportunity to further education, but other pessimistic participants saw it as likely or currently leading to the emergence of *dual* secondary school systems in Tanzania, the "poor quality" community schools versus better established, funded and resourced secondary schools which were mostly financed by the government. With this growing hierarchy of status of secondary schools, the selection strategies are likely to work in favor of the children of the rich stratum being selected for better schools, leaving the ill-equipped for the underdog. With a dual system it is highly possible for the favored secondary schools to have "excellent" examination results every year. The extent to which this hypothesis is valid needs an immediate investigation. It is possible that the role of the examinations as a means of allocating "life chances" is at the heart of this observation. It is for the same reason that the rich and powerful stratum of this country has successfully created silently dual schooling in the primary school system, the "superior" one being the "Bunge-type" and English-medium primary schools.

Formative Role

The dominance of the summative screening role of examinations has meant that they have hardly taken a formative role in diagnosing instructional problems, that is, communicating to the teacher weaknesses and strengths in teaching methods, particular language problems, areas where greater concentration is needed to be given to study certain skills and processes, and above all, to discover "room for maneuver" to orient the evaluation system to the fostering of an inquiry goal. We have already seen that while they were still at the marking centers, markers of scripts wrote reports which contained their comments on each question and general appraisal of the entire examination in each academic subject. When teachers were asked to comment on the usefulness of this feedback on written examinations, they all said these reports never reached them. Some heads of schools said they got the reports but they were confidential and were therefore locked in their offices, and that this feedback was not being disseminated to schools regularly. In fact, all teacher participants were not aware that this feedback existed. Instead of revealing this feedback to teachers so that it would be used as a source of strength and instruction, it was instead regarded as embarrassing and "dangerous" information that had to be dumped in file cabinets as "top secret."

The relationship between NECTA and other educational institutions and researchers has also been one of secrecy and distance. The Council has kept everything to itself, and it has never allowed researchers to analyze examination scripts for detailed feedback; scripts were confidential and were destroyed after a while. National examinations have thus served the summative rather than a formative role This secrecy, however, could be due to the power examinations have traditionally had in "judging" not only pupils, but schools, teachers, learning styles, and even the whole examination system, including the examiners themselves. The secrecy attitude of the Council may partly explain lack of collaboration between it and other educational institutions. All curriculum developer interviewees said that they never cooperated with NECTA in the setting of examination questions or at least to discuss together how to reform both the examination system and the curricula. Interviewees from the Council also said they did

not interact with the ICD on this issue. "We operate within the limits set by the Act of Parliament," one examiner reported.

Communication between schools and NECTA has also been lacking. Teachers were not being involved in the final written examinations, except where a few of them were appointed once a year to set questions, supervise examination sessions in their schools, and help in the marking of examination papers. This *token participation* actually tended to involve teachers in leadership positions such as heads of subject departments, academic masters, and those responsible for the discipline of pupils. Overall, the process of examination used by the Council has remained far removed from most teachers in the schools. A common way of the Council to communicate with schools and teachers' colleges has been in the form of NECTA issuing guidelines and regulations on the conduct of continuous assessment. But, such information is only valuable if it is *communicable* and *communicated*. The dissemination of this information, like other ministerial circulars and other documents, has usually been conceived as being dispensed from the high in the manner of prophets expounding the law, and often remain unread and unused as intended. In fact, important documents were not availed to all teachers for careful study and analysis. For example, the Council's booklet outlining the new guidelines on the conduct and administration of Continuous Assessment in secondary schools and teachers' colleges (National Examinations Council of Tanzania, 1991) had not been disseminated to teachers by the time data collection was being done for the purpose of this study. While, for example, the new guidelines had directed teachers to use character assessment schedule ranging from 901 to 907, schools were still using the old one that ranged from 901 to 911. My sons' 1992 reports from their secondary schools were still using the latter schedule.

NECTA is supposed to regularly conduct, seminars and workshops for teachers so that they know and appropriately utilize assessment procedures that it advocates. The examiner participants said the Council was unable to conduct such inservices due to lacking funds and personnel. Whatever the reason, however, there has not been any systematic way of examiners reaching out all or the majority of schools by the way of providing feedback and guidance on matters of evaluation of students and curriculum. Besides, examiners in NECTA have not been responsible for the evaluation of teaching process or learning *in situ*, a task assumed to be done by the inspectors of schools. Unfortunately, communication and collaboration between examiners and inspectors has been non-existent, just as was the case between examiners and curriculum developers. Lack of effective communication and collaboration between the Council and teachers in schools was likely to undermine the smooth supervision of the project component of continuous assessment by teachers, because they were likely to lack the guidance and support needed to comprehend and effectively use the proposed type of CA projects which also demanded a good background in educational research; a background which teacher interviewees admitted to be lacking seriously. Teachers said *research* and *evaluation* were among the topics which were either not taught at all or taught superficially through theoretical lecturing. They all agreed that they were weak in this field or hardly knew anything about it. These responses may point to the existence of the assumption of specialism in the evaluation field: that evaluation is the business of examiners in the NECTA and MOEC's headquarters rather than the school teachers. Teacher educators may have held this assumption and de-emphasized the importance of evaluation in their "lived" teacher-education curricula. They may also have suffered the same problem of having weak or no background in the field just as the school teachers.

The assumption of specialization may have been reinforced by operating with a highly centralized and strictly confidential evaluation system. It seems that this confidentiality has been hampering the Council from interacting with the educational

institutions which could have helped it gain creative insights into how to make examinations and tests inquiry-oriented. Since NECTA's major preoccupation was to prevent "leakage" of papers and marks, what has resulted was a siege mentality in which everything remotely concerned with assessment was kept under wraps. Such an attitude does little to solve the real problems of security and hinders the desire of educators to learn from and reflect upon the Council's evaluation practices and to collaborate with it in a manner that is likely to encourage development of an inquiring mind.

CONTINUOUS ASSESSMENT

The summative screening function of examinations becomes very important when associated with the significance of passing disciplines which are accorded high status and thus crucial to the allocation of "life chances" in society. Because the rewards of success in such examinable disciplines are high - high income and social status job, a place at secondary school and higher education and associated better living standards - it is possible that many people have desired the traditional paper-and-pencil mode of assessment which is seen as objective and fair. This attitude may partly explain the reason for over-awarding, and thus over-valuing, paper-and-pencil terminal tests component of continuous assessment. The economic and social significance of the written tests and national examinations to the future prospects of pupils and their families is so great that the pressure to pass them has led to corruption. Mukyanuzi (1978; 1990, p. 14), for example, reports that although continuous assessment was expected to encourage students to perform academic work continuously it led to corruption, since it was sometimes influenced by gender, income, and social class differentiation.

Continuous assessment was regarded by the Council as a way of sharing the responsibility of assessing and eventual certification of students between it and schools (National Examinations Council of Tanzania, 1991; Ndabi; 1986). An examiner interviewee stressed that by letting secondary school teachers take the responsibility of conducting continuous assessment which carried 50 percent weight, as written national examinations did, the Council had fully endorsed and operationalized the participation of teachers in the national evaluation system. This evaluator argued that terminal tests set by teachers in schools were not external since they were written and administered by teachers themselves. This argument looks plausible, but the fact that these tests were externally engineered, and the forms and procedures of their administration imposed by the Council, makes it is hard to accept the claim that they were not external. Teachers had no choice to act otherwise, but implement the guidelines of the Council. Teachers who had different notions of "efficiency, reliability, validity and relevance of assessment" (National Examinations Council of Tanzania, 1991, p. 1) had to comply with notions advocated by the Council. Teachers who believed that criterion-referenced tests limited the chances to develop their pupils' ability to inquire had to administer them whether they liked it or not. If discretion of continuous assessment had been granted to schools by NECTA, some, and probably most, teachers would have preferred to award 45 percent to inquiry-oriented projects and 5 percent to tests and thereby gear teaching and learning to activities that promoted an inquiring mind than reward highly traditional, discipline-based, academic rationalist tests which, like national examinations, encouraged rote learning and teaching.

Obviously rewarding 95 percent to written examinations was a mockery of the need to foster "core elements of such objectives, such as developing of the inquiring mind and problem solving abilities and skills; building of self-confidence in students; promotion of cooperative attitudes, orientation of education towards work, etc." (National Examinations Council of Tanzania, 1991, p. 8), which the Council hoped to promote through the projects component of continuos assessment. Over-awarding of written tests

and examinations can only continue to make the educational system overwhelmingly examination-driven. Unfortunately, the product-oriented, discipline-centered theoretical examinations and tests are by their nature not likely to enable teachers and pupils to produce their own knowledge and materials, critique existing ones and challenge the status quo, experiment, and thus act upon their environment in order to transform it for their own benefit and that of their society.

Some interviewees revealed that character assessment was being done arbitrarily, without basing it on systematic and reliable records of pupils' progress and attainment of character traits and dispositions. The reason for this problem could be due to treating this assessment as a marginal component to the awarding of success in the mastery of examinable knowledge. As long as scores in character assessment were not part of the final scores that determined the quality of certificates awarded by the Council, and since the chances of a student failing in this assessment were negligible, it was obvious that character assessment could not be valued as much as assessments in traditional disciplines which mattered crucially in determining one's future "life chances." Indeed, all student interviewees did not take character assessment seriously, as they were aware of its arbitrariness and the minimal effect it had on their academic success. All students believe strongly that the chances of their failing in character assessment was nil, and that it was not likely to affect their future prospects.

An analysis of the "character assessment schedule" reveals that this assessment is not primarily directed at the identification and fostering of the character traits or dispositions that are central to the promotion of an inquiring mind. The elements of conduct included in the schedule are definitely extremely basic to the nurturing of a good citizen. However, these attitudinal elements hardly include those character traits that a pupil needs to acquire in order to conduct meaningful inquiry. Preoccupation with the examining of examinable knowledge from traditional disciplines has precluded the possibility of identifying, inculcating and assessing inquiry-oriented attitudes and values that are necessary to the development of an inquiring mind. These schedules seem primarily intended to serve an ideological rather than pedagogical interest, hence the exclusion of score in character assessment from determining the quality of academic success of students. Furthermore, character assessment has not much value in an educational system based essentially on the ethos of academic rationalism, which seeks to be objective rather than subjective. We will return to this question of establishing objective standards shortly.

An inherent paradox of current examinations and tests was that, on the one hand they allegedly sought to assess a learner's ability to handle change and on the other, because of their need to maintain standards over time, they often sought to test outmoded attitudes and dispositions - for example, those attitudes and values related to academic rationalism, submissiveness, protecting the status quo rather than questioning it, and the like. Ironically, too, it seems that the attitude of students to examinations and vice versa: dependence and fear on the one side, authoritarianism and condescension on the other, contrast markedly with attitudes or dispositions which examinations in particular and teaching in general seek to foster. It seems, for example, difficult to promote the attitudes of "cooperative endeavor," participation in social action and social unity through the teaching and learning processes and then to test those attitudes by means of an assessment exercise and context which are competitive and socially divisive. It is also a contradiction to expect to promote the attitude of pedagogical democracy, which the ESR policy suggests, in an educational system that utilizes punitive and threatening teaching and evaluation practices. Genuine efforts to develop an inquiring mind in the Tanzanian school system will have to take the resolution of these contradictions as a matter of first priority. Resolving such contradictions could prove more crucial to the success of

meeting this and other educational goals than mere acquisition of funds and other resources that are usually regarded as critical to "modern" and "rich" teaching and learning climate.

THE NATURE OF TESTS AND NATIONAL EXAMINATIONS

All teacher and administrator interviewees believed that tests and national examinations mainly focused on the testing of knowledge category and not the assessment of elements of an inquiring mind. They agreed that examinations *per se* hardly assessed students' ability to think creatively, reflect on, or challenge ideas. They also noted that no one was paying attention to the assessing of inquiry elements by using tests and national examinations. Analysis of the 1988 to 1990 Certificate of Secondary Education Examination Paper 1 which was for both school and private candidates (paper two was for private candidates only) and the 1989 Form 2 Secondary Education Examination in Geography indicates that, although these examinations may have been of good quality in a *technical* sense - much technical measurement skills and care had gone into their construction and presentation - the range of content over which knowledge and skills tested was narrowly limited. Virtually all examinations tested funded knowledge from textbooks and only required candidates to merely remember and reproduce the crammed information.

The analysis of these past geography examination papers reveals that the type of questions set by the Council were mainly those which encouraged memorization and regurgitation of discrete information. For instance, the whole of the 1989 Form 2 Secondary Education Examination like the previous ones, consisted of multiple-choice, filling in, matching, and true/false questions - the so called *objective* type items. The paper consisted of two sections. Section A examined map work, physical and mathematical geography, while section B tested regional geography. Of the 70 questions asked in the whole paper, 17 required candidates to "write the letter of the correct answer in the space provided against each question;" another 17 questions wanted the students to "match two lists by filling the correct letter from list B in the space provided against list A;" 8 questions required students to "write True or False where appropriate against each statement;" and 28 questions required candidates to "fill in the blanks."

Analysis of the 1988, 1989 and 1990 Certificate of Secondary Education Examinations paper 1 (O-level) indicates that the paper consisted of five sections. Section A tested map reading and photograph interpretation; Section B asked questions on physical and mathematical geography; section C on East Africa; section D on the Rest of Africa; and section E on North Western Europe, North America and Asia. Of these sections, only section B consisted of objective questions. However, the questions in the other sections were short, well-structured or bounded questions which required candidates to *name, give, calculate, list, define, compare, differentiate, mark, show, draw,* and *state*. Examples of such questions from these past papers include:

(1) Name three types of geographical photographs.

(2) Give two similarities between an air photograph and a map.

(3) Name six essential equipment used in conducting chain survey.

(4) How does the scale of a topographical map differ from the scale of an air photograph?

(5) Define the scale of a map.

(6) What are the main factors which have influenced the location of X settlement?

(7) Draw a sketch map of East Africa and on it show the main physical features.

(8) On the map of North America provided

(a) Mark and name the following: (i) The Appalachian Mountains. (ii) Mississippi River. (iii) The Great Lakes. (iv) The Rocky Mountains. (v) Longitude 100 degrees West.

(b) Give four reasons for the industrial development in the South East and North East of the United States of America.

(9) (a) Give reasons why the Nile River is very important to Egypt.

(b) Why is livestock rearing limited to the Northern part of Nigeria?

(10) Give three main factors which have contributed to the agricultural development of Southern China.

Such questions ask candidates to remember and reproduce the content memorized from teacher-given notes and textbooks.

A study by Ndabi (1987, p. 16) in which he analyzed Physics, Chemistry, and Biology national examination papers for the years 1983-1985 provides some evidence that those examinations virtually tested theory only. The practical skills and processes of "manipulation of scientific equipment," "ability to plan procedure and techniques for solving practical problems," and "ability to carry out scientific investigation" were the least tested. In fact, the first two components were almost not tested at all. An examiner interviewee cited a similar study which was conducted by his colleague in which she found that about 80 percent of the questions asked by teachers in the teaching of Biology in secondary schools consisted of recall or comprehension questions. It is interesting to note that such analysis had been conducted for science subjects only; none existed for social sciences and other subjects. A general observation is that neither the school-based questions nor those set by the Council were focusing on or encouraging active inquiry into issues and problems genuine to the learner and society and the production and application of funded and non-funded knowledge in real-life situations. As one participant observed, "this kind of examination does not encourage pupils' reasoning, thinking things out, and putting them into a logical sequence of their own. They only look at the questions and tick. As a result, this makes teachers teach the facts needed in the examinations." The assumption seems to be that children will learn about "big ideas," the important concepts, and principles by doing tests and examinations that emphasize the trivial and inconsequential. It is assumed that when children have filled in all the answers to a test completely, they have really learned the subject.

This phenomenon, however, was not only confined to secondary schools and teachers' colleges. A professor participant from the Faculty of Education said that university-based examinations were also of regurgitation type. There seems to be a vicious circle here, too: the examiners set questions asking pupils to remember facts; teachers teach by copy-copy methods that lead to cramming and testing discrete facts; students memorize and reproduce in school-based and external tests and examinations; these students become teachers, tutors, and professors and teach and evaluate as they were taught and evaluated. It is a very persistent vicious circle.

Analysis of the past examination questions and tests set by schools revealed the existence of the backwash effect of the Council's practices on the former. Teachers tended to adopt the forms of questions and paper formats used by the NECTA. For example, the geography mock examination that was done by Form 2 pupils in one of the research schools in Dar-es-Salaam City in 1990, used the forms of questions and format that were exactly the same as those used in a Form 2 secondary education examination set by the NECTA for the year 1989.

Testing the testable seems to be a persistent, old, and probably international problem. Boraas (1922, pp. 6-10) made an analysis of the State High School Board Examination Questions given in Minnesota Schools during the years 1899-1912, and found that real thought exercises and examinations were exceedingly rare in those schools.

Testing Theory

Testing theory rather than practicals was becoming a big issue in Tanzania. Both examiner participants revealed that national examinations, particularly at O-level, were becoming extremely theoretical in nature because, they claimed, schools lacked the resources to enable students to do practicals before and during national examinations. As a result of this problem of shortage of needed equipment, examiners said, starting from 1991, the Council adopted a policy of not setting practical papers at O-level. For those subjects in which practicals were a necessary component, only alternative papers to actual practical exercises would be set, and they would include *simulations* of practical situations. Most teacher and administrator interviewees, including the examiners themselves, were worried that this Council's measure to test practicals theoretically and eliminate completely practical papers would aggravate theoretical teaching and learning that was already a common phenomenon in schools and other educational institutions in the country. Teachers and pupils said that practical activities both in the classroom and outside the four walls were not being done at all. With total absence of practical papers, teachers and pupils would see no reason to spend some time doing practical work, which was not going to be examined anyway. This Council's decision was certainly going to reinforce the current practice of memorizing discrete information for the sole aim of passing national examinations and thereby stifle further the possibility of orienting the educational system to "process-focus" rather than "product-focus." This decision actually amounts to the endorsement of the entrenchment of the ethos of academic rationalism in the education system and alienation of students and teachers, and thus the society, from tackling their real world life problems and issues.

Since the examination system stressed assessment of acquisition of disciplined knowledge only, the range of knowledge tested is limited to "needs later" - that which is useful for further study or use in the future - rather than "needs now" - that which is of immediate use in daily life. Of course, balanced assessment needs to focus on both needs, and it is only inquiry-oriented education that can serve both needs without promoting one at the expense of the other.

Ironically, too, this move is likely not to facilitate the development of science and technology, a preoccupation that has currently dominated the thinking and practices of the majority of policy makers in the educational field. Examinations of this kind can easily become the tail that wags the educational dog, producing a backwash effect upon content and methodology of the curriculum. This "backwash effect" may not only have a detrimental effect on the quality of the curriculum, but it could rob other agencies, notably teachers and pupils, of the power to influence the very results produced by the examination. Thus, the power of examinations, irrespective of how intrinsically good or

bad they are, may have dwarfed other equally legitimate influences upon directions of learning and teaching for the development of an inquiring mind.

One interviewee, for instance, cited an example of practicals in Biology and Geography. Despite beautiful flora and fauna, magnificent landforms, and numerous economic activities that surrounded secondary schools, teachers were drawing and testing diagrams of flowers, insects, plants, and relief features found in textbooks instead of getting pupils to go out into the field and collect the samples, observe, describe them, and write their own accounts. In geography, many practicals do not need expensive equipment. With little improvisation, many of them can be made by teachers and pupils in the school or with very little money involved. Besides, practical exercises can also be assessed continuously and be awarded marks that can be part of the final grades. Instead of the Council thinking along these lines, it decided to stop assessing practical work practically and introduced "simulated" theoretical practical questions. Indeed, this decision is another testimony for the Council having failed, or probably having "been failed" by some senior executives, to find alternative methods of assessment that would stimulate the educational system to focus on the development of an inquiring mind.

A Hierarchy of Status of Subjects.

Another serious shortcoming of the Council's examination practices, which links with the ethos of academic rationalism, is the neglect to examine subjects accorded a low status in the hierarchy of disciplines. It seems that forces behind the allocation of "life chances" through the examination system has led the Council and those involved in making decisions on the policy of evaluation in Tanzania to interpret relevance very largely as relevance of economic and employment needs, a perception that has been strengthened by the prevalence of the Human Capital Theory. What has happened is that the learner's needs of "self-esteem" and "self-actualization," which are an essential element in the development of an inquiring mind, have been ignored. Although there has been some rhetoric concerning the preservation of culture, on the whole creative and cultural elements in the curriculum and evaluation have been accorded a relatively low priority in Tanzanian secondary schools as well as primary schools and teachers colleges. It would be hard to find support for the view that art, dance, drama, or the writing of stories or poetry were of the first order of importance in schools. They are accepted and included in the school timetable, it is true, but in a strictly subordinate category to the "real purpose" of education and with the unspoken assumption that when the going gets tough, it is these elements which are eliminated. Lists of examinable subjects that constitute annual examination results released by the Council indicate that these aesthetic and other subjects such as sports and games (physical education) were not being examined at all in the school system. As a result, these subjects were not being taught because they were regarded as a waste of time by both pupils and teachers. As in the case of self-reliance activities, because these subjects have been relegated to a non-examined category, they have had little status among teachers and students alike.

The Councils' neglect of assessing these forms of knowledge and ways of knowing is another testimony for its deep-seated belief in academic rationalism and its concomitants. For the Council, relevant content to be examined is disciplined, theoretical knowledge and the skills associated with it. Deeper issues like developing elements of an inquiring mind, to enable learners to cope with change, have been given little attention. In the new guidelines regarding the "project" component of continuous assessment (National Examinations Council of Tanzania, 1991), the Council supports "creative" projects as those likely to cater for the fostering of this element of inquiry. Such projects, it is stated, "seek to encourage and foster the development of creative abilities and skills among the students. They require the student to cultivate an artistic sensitivity in

expressing his thoughts and feelings. In subjects like Music, Fine Art, Sculpture and Literature, including Drama, Prose and Poetry, students will usually be exposed to some examples of artistic work" (p. 27). Ironically, however, these six types of projects were optional. Students could opt to choose certain types of them and avoid others. Of course, this opportunity provides flexibility for the students to choose the projects of their interest, which is fine, but, it also means that creative category of projects can still be neglected and, if chosen, awarded five percent out of one hundred percent, with the remaining ninety-five percent being reserved for the traditional academic disciplines. This reward system ensures that academic rationalism is well rewarded.

Complexity of Examinations

Complexity of national examination questions was among the major problems addressed by the majority of interviewees, particularly educators and pupils. The concern was that some of the questions set by the Council were too complex for O-level and A-level pupils. Some teachers said that some Form 4 final examination questions were more difficult than similar questions set for Form 6 level. "NECTA seems to have no sympathy for secondary school students. Some of the examination questions administered to Forms 4 and 6 as final examinations are at the University level," a professor from the Faculty of Education commented. A curriculum developer interviewee, too, believed that "there is a tendency by NECTA examiners to think that the more difficult the examinations the better the standard of education. Yet most of those questions test recall of crammed information." This curriculum developer said that those complex questions tested more advanced knowledge than that included in the prescribed textbooks written by the ICD. Most teachers and pupils, however, said that the content in these textbooks was too shallow and inadequate to help them tackle those complex questions.

Mbilinyi (1975) revealed that the tendency to set "tough" questions was also a common phenomenon at the University of Dar-es-Salaam. She observed that "departments have been known to pride themselves at the University on the number of students flunked out in final examinations, a sign of the high standards of lofty knowledge of the lecturers" (p. 5). It seems there is another vicious circle here as well: the graduates of this top level academic rationalist institution carry with them this attitude to other educational institutions where they happen to work, particularly to schools, teachers' colleges, and NECTA. This system keeps reproducing itself indefinitely. Virtually all the pupil interviewees complained that some questions set in school examinations were very difficult. "It is as if some teachers want to see us fail in big numbers," a student lamented. Some reasons for this problem may relate to language problems which will be discussed later, but there is a relationship between this issue of complexity of examination questions with the characteristic of academic rationalism of making funded knowledge "rigorous," "pure," and "hard" enough to qualify for the training of the mind, a legacy of the British grammar school. There is a belief that the more difficult the questions are the more intellectually appealing they become. Related to this belief is the point observed earlier that students and teachers found several topics, particularly those that lacked concrete examples, to be very abstract and thus "remote" and "obscure" in their minds. These problems, coupled with the tendency to limit instruction to a textbook-based teaching and learning climate rather than investigating issues from various sources, must have contributed to this issue of complexity of questions set in school tests and national examinations.

Whatever the explanation of the attitude leading to setting complex questions in order to have some pupils fail, it does not serve the need to develop the inquiry abilities of our children. It is unfortunate that those students who pass such examinations are regarded as very intelligent, while in fact, they may only be good memorizers and parrots.

Children who cannot memorize but like to question things and understand them fail such regurgitation tests and examinations, and carry the dehumanizing label of "failure." This label should indeed be carried by the "engineers" of this educational system who impose onto schools and society depersonalizing frames of reference and practices.

EFFECT OF EXAMINATIONS ON THE PRODUCTION AND USE OF RESOURCES

The majority of interviewees attributed the dominance of "textbook-based" rather than "resource-based" teaching and learning climate in secondary schools to poor economy and lack of funds. While this attribution can not be denied, the power of the examination seems to have contributed greatly to the prevalence of this state of affairs. It seems that examinations have tended to severely limit the efficient use of the existing resources and the production and acquisition of new ones. The preoccupation with the sole goal of enabling students to pass tests and national examinations has led to reliance on a prescribed textbook and teacher provided notes as the only major teacher and student sources of information. Once notes are crammed, it becomes possible to pass the examinations. Consequently, neither the teacher nor the student sees the need for or feels the pressure to consult other various sources which are available in the school. Such an inquiry-oriented effort becomes unnecessary, a waste of time, and in fact redundant. This tendency may have been the reason for the school libraries remaining undeveloped, unused, and in some schools closed completely or absent. This reason may be why schools have not regarded the immediate and wider community as an important teaching and learning resource. Teachers, after having developed the habit of covering a prescribed textbook from cover to cover as a measure of completing the teaching of examinable knowledge, may have also missed the reason for being innovative, improvising, and creating a resource-based instructional climate or bothering to get their pupils conduct field work and community-based inquiries. The examinations' "backwash effect" has in this case confined teaching and learning to minimal sources such as "pass notes" that can enable pupils to memorize as many facts as possible to get them through those examinations.

The underlying message is that, even if secondary schools and teachers' colleges are to secure all the teaching and learning resources they require, there is a likelihood that those resources will remain unused, under-utilized or misused so long as the power of examinations continues to dictate the use of only one or two sources that will enable pupils to pass those examinations. Indeed, in all secondary schools visited, many books and other resources were not being used, but would have been very useful had teaching and learning focused on the development of an inquiring mind. In a sense, therefore, shortage of instructional materials that formed a common song in all schools was partly only an apparent scarcity prompted by dominant, anti-inquiry instructional practices. Under such circumstances, current attempts by the MOEC to rehabilitate secondary school and teacher education libraries and open one hundred new ones in select primary schools by using a loan from World Bank's Eighth IDA project is likely to be a gross waste of money and energy. However those libraries are stocked with authentic books, schools and teachers colleges are likely not to use them effectively as long as existing examinations continue to influence teaching and learning the way they currently are.

This point is an important message to those people in educational circles and key educational policy makers who have explained the shortcomings of Tanzanian educational system only in terms of economics - poor economy; lack of funds; shortage of qualified teachers and other personnel; shortage of books, desks, chairs, stationery and the like. Important as these resources may be, they may not be as important obstacles as the attitudes and values held about education and the way it should be provided. Change

of certain crucial attitudes and values by educational personnel and especially those who determine the fate of the educational system in the country may be a more central determinant of the direction and success or failure of the system than the money factor alone. The way things currently stand, no amount of money can enable the Tanzanian educational system to orient itself appropriately to the goal of developing an inquiring mind, unless certain inhibiting attitudes and values held by key authorities do change. Among these are those attitudes and values related to assessment and examinations.

In essence this means that continued borrowing of funds from international donors for improving the quality of education will hardly lead to the fostering of an inquiring mind unless these attitudes and values are critiqued, understood, and eliminated. If the World Bank spent its entire annual budget on Tanzania's education, that spending would not help foster an inquiring mind in the system so long as those attitudes and values and their supportive ethos persist. This problem partly explains the reason why Tanzania has registered tremendous quantitative success in education over the years since independence, but not a corresponding qualitative success. Money will enable us to build more schools, educate more teachers with higher qualifications, increase enrollments, pay higher salaries, build more libraries, import more textbooks or produce more locally and so on, but with those anti-inquiry evaluation attitudes and values prevailing at full force, the quality of education will continue to suffer. Persistence of the current examination system which is largely antithetical to the inculcation of an inquiring mind is a function of such attitudes and values, not money. Given the will for genuine educational change, such attitudes and values are not beyond our power to change. The development of an inquiring mind itself is an assured means to solve this problem: a serious inquiry into our belief systems about education.

CONGRUENCE-MEASUREMENT PARADIGM

Strong evidence indicated explicitly that evaluation practices and ethos in Tanzania are deeply rooted in what may be called *"congruence-measurement paradigm"* in educational evaluation. In Tanzanian curricula, the thinking and practice have been greatly influenced by Tyler's rationale, which in turn, embraces academic rationalism and positivism. This rationale, which is also based on educational measurement, has similarly influenced the thinking and practice in educational evaluation in Tanzania. The rationale advocates the congruence between student performance and objectives stated in terms of measurable, overt students' behaviors - the behavioral objectives.

The notion of congruence was first proposed by Tyler as an outgrowth of his work on the Eight-Year Study of the 1930's (Stufflebeam et al, 1971, p.11, Taylor and Cowley, 1972, pp. 1-4; Worthen and Sanders, 1973, p. 20), and it is typical of his rationale of curriculum and instruction. For Tyler (1950), "education is a process of changing the behavior patterns of people" (p. 6). Stemming from this conception of education, Tyler sees evaluation as the process of comparing performance with clearly defined objectives:

> The process of evaluation is essentially the process of determining to what extent the educational objectives are actually being realized by the program of curriculum and instruction. However, since educational objectives are essentially changes in human beings, that is, the objectives aimed at are to produce certain desirable changes in the behavior patterns of the student, then evaluation is the process for determining the degree to which these changes in behavior are actually taking place (p. 105-106).

In Tanzania, evidence of the belief in Tyler's congruence model of evaluation is provided by Lema (1973) when he writes:

> Evaluation in curriculum should enable us to compare the actual outcomes with intended outcomes, and on the basis of this comparison to decide on the future action. Evaluation is itself a process - a process carried out to determine how well an educational program is achieving its objectives. It follows that the most precise and specific the behavioral objectives of the curriculum, the easier it becomes to evaluate its outcomes (p. 45).

The extent to which NECTA adheres to Tyler's behaviorist rationale may be ascertained from its (Ndabi, 1986) specific guidelines for the purpose of setting an examination which include:

a. Listing of content topics or curriculum analysis. This is usually achieved by careful scrutiny of the set textbooks in current use, curriculum guides, teaching syllabus and question analysis of past examination questions.

b. Listing of specific instructional objectives, such as: knowledge of basic terms; understanding of concepts and principles; application of principles; interpretation of data; etc. *Specification of instructional objectives and other abilities elicited in the syllabus form the cornerstone of setting or developing any achievement test.* Essentially the process leads to drawing up of a test blue print, commonly known as a table of specification (p. 9) (emphasis added).

Ndabi (1986) discusses the *measurement techniques* used by the NECTA to quantify students' performance.

The Council's practices of educational measurement were also being extended to continuous assessment scores. Since teachers' assessment data were seen by the Council as purely *subjective*, the question of how this data had to achieve *uniform standards* had yet to be answered (Ndabi, 1980):

> It is well-known that our schools differ in many ways and in varying degrees. For example, school supplies, school environments, quality of teachers, quality of students and so on. In addition to these differences, teachers as well as individual schools tend to differ in their administration of CA. Knowingly or unknowingly, some teachers do set questions for the exercises and tests of very low standards and some of very high standards. The scoring of such questions will also vary in the same manner, thus giving rise to large disparities in the students' scores in different subjects and in different schools. As Mtani (1983) correctly observed, ... human element has some contributory factors too: Most of the teachers love to see their students pass ... examinations and therefore some of them may think awarding inflated marks would help ... [Also] CA scores tend to be higher than FE (Final Examination) scores in corresponding subject, of both O-level and A-level (p. 12).

Thus, "in order to minimize such irregularities, NECTA has devised a *standardization procedure* in which the FE score is used as a moderating factor" (Ndabi, 1986, p.12). In other words, a statistical procedure is applied to standardize subjective CA scores in order

to establish their objectivity. This process, which is based on objective scores obtained in the written national examination (that is, FE), is tantamount to transforming the "internal" assessments made by teachers into "external" objective standards set by the Council.

The notion of *mastery of the minimum essentials* used by NECTA to establish the level of difficulty of achievement tests situates the theoretical basis of the practices of the Council into the camp of the measurement movement that advocates "evaluation for mastery learning." This behavioral school of thought requires teachers to state all instructional objectives in terms of measurable, overt, student behaviors. Besides, each such objective can be utilized directly as a test item. It is in the light of this movement that Popham and Baker (1970), for example, advocate for what they label as "student minimal levels" and "class minimal levels" aimed at establishing mastery of the "minimum ess ntials" at both levels. Popham and Baker thus write:

> The teacher must indicate the level of proficiency that he expects of a particular student. For example, if he wants students to perform certain division operations involving three-digit numbers, he ought to state what proportion of the problems on the final examination the student will be able to solve correctly. For example, should he be able to solve eighty-five percent of the problems correctly? In many cases, the teacher will set a student proficiency level somewhat lower than one hundred percent to allow for calculation errors, causal oversights, carelessness, and so on (p. 40). In addition to establishing student minimal levels, the teacher ought to describe how well the total class should perform with respect to the objectives. For example, he might indicate that ninety percent of the class ought to perform with at least eighty percent proficiency on the sentence-analysis exercises in the final examination. Or, again, all of the students should be able to recite from memory, with no more than one error, the five-line passages indicated in the text (p. 41).

This movement and its concomitants has been embraced by the Council which at the same time purports "to strengthen pupils' inquiring mind" (Ndabi, 1986, p. 12). The crucial question here is to uncover the contradictions between the ethos of the congruence-measurement paradigm and conditions that are conducive to the development of an inquiring mind.

Some Limitations of the Congruence-Measurement Paradigm to the Development of an Inquiring Mind.

The congruence-measurement paradigm has influenced evaluation thinking and practices in the Tanzanian educational system. The degree to which its "backwash effect" has influenced the "lived" curriculum in schools and teachers' colleges is a question that needs immediate attention. But this paradigm roots in nothing else but positivism and other technocratic practices and beliefs typical of the competency-testing and mastery learning movement.

The congruence-measurement paradigm has shortcomings which might have contributed to the stifling of the efforts to develop an inquiring mind. This critique focuses on behavioral objectives because they form the cornerstone of the ethos of the congruence-measurement paradigm and related metaphors. These objectives constitute the basis of behavioral psychology which dominates the paradigm and to varying degrees, of cognitive and developmental psychology as well. It is significant therefore to lay bare the beliefs and attitudes that underlie these objectives if education has to depart from the dictates of this school of thought.

The distinction between behavioral and non-behavioral objectives lies in the choice of verbs. The behaviorally stated objectives use "overt," "performance" verbs such as to write, recite, identify, list, name, construct, calculate, draw, and the like, because these are publicly observable behaviors. Analysis of past national examination papers reveals the use of such verbs and, thus, the adherence to the principles of behaviorism. The nonbehavioral statements, covert verbs such as to enjoy, believe, have faith in, appreciate, understand, know, and so on, are regarded as "loaded words" which are open to a wide range of interpretation. These are seen as not indicating how the student will visibly show his or her understanding or appreciation much of which is neural and cerebral activity hardly open to observation and measurement.

One basic shortcoming of the use of behavioral objectives is that they limit achievement by putting ceilings on student aspirations and by not encouraging unexpected or creative learnings. It is even impossible to list and describe fully all the particular behaviors desired. In complex subject matters and skills, behavioral objectives may be neither possible nor desirable. "In the arts and subject matters where, for example, novel or creative responses are desired, the particular behaviors to be developed cannot easily be identified. Here, curriculum and instruction should yield behaviors and products which are unpredictable. The end achievement ought to be something of a surprise to both teacher and pupil" (Eisner, 1972, p. 75). However, insistence on behavioral objectives and testing the measurable has rendered examination questions to remembering questions which assess only discrete information and low-level inquiry processes. The use of so-called "loaded" verbs which cannot be captured by technical methods of instrumentation has always been omitted from evaluation of this kind. Analysis of past examination papers reveals that such knowledge and feelings and ways of knowing have been ignored and/or relegated to the marginal and subordinate status, as was the case with character assessment and aesthetic subjects. Here, again, a link between this paradigm and academic rationalism can be discerned.

A problem related to the above issue is that behavioral objectives are seen to be the only content of the curriculum. This narrow content compels the evaluation to assess everything in terms of effects on students - the student achievement. It is then assumed that performance of students can be used to make valid judgments regarding the performance of the teacher, generally in terms of the previously established class minimal level of student performance (Popham and Baker, 1970, p. 130). But the reason that leads these writers to suggest that the performance of the student cannot be generalized from the assessment of teacher's performance is the same reason that should cause us to hesitate generalizing the performance of the teacher from the assessment of student's achievement. Moreover, not everything learned by the student is the result of teacher's participation in facilitating student learning.

Eisner (1972) questions the belief that behavioral objectives can be used as criteria by which to measure the outcomes of curriculum and instruction. He argues that there is a vast difference between making a qualitative judgment and applying an objective standard. We can make a behavioral judgment of a piece of writing in terms of grammar, syntax, and even logic. But what shapes our preferences for literature or writing is the result of aesthetic impact of content and style - a qualitative judgment that varies with individuals and time. It is often the uniqueness of what the writers say and do rather than their conformity to a standard that gives their writing literary and artistic value. As such, not all outcomes of a program and instruction are amenable to measurement.

Related to this issue is the belief in the use of written and spoken word in teaching and testing in theoretical settings. Our schools have been made to believe and emphasize that to do well in studies requires that students are able to demonstrate their achievement

mainly in the written or quantitative statement and sometimes in the spoken word, and usually theoretically. The use of these symbols is of course of great importance in making one's way in the world. "But as important as these abilities are, they are not the only means through which we represent both internally and externally what we know, believe or value. The human's ability to construct reality takes a wide variety of forms, only some of which are couched in the written word. What men know surely exceeds what they can say. What one is able to conceive of is not limited to what one can define in linguistic terms alone. Our conception and our awareness exceeds our speech" (Eisner, 1975, p.8).

The problem is not these representations *per se*, but the limited and marginal way in which non-linguistic and non-quantitative competencies which form the crucial basis of an inquiring mind are regarded in school programs by advocates of the congruence-measurement paradigm. Being good in school is seen as being able to demonstrate competence through the written word at the end of instruction. And even there, as Eisner (1975) notes, the level of proficiency is often more concerned with the artless than the artful. Such thinking parochializes the conception of human ability and narrows the avenues available for human performance.

Another major problem related to the congruence-measurement paradigm is the question of linear programming, which always begins with the identification of behavioral objectives and ending with evaluation. This linearity causes evaluation to become a post-facto or terminal activity: evaluation is often seen as the last of a series of tasks, one that has to give an indication of final success. In fact, even behavioral objectives themselves are also referred to as "terminal behaviors" or terminal performances".

According to NECTA's current guidelines (National Examinations Council of Tanzania, 1991) all the tests which were supposed to be part of CA were terminal, just as the national examinations were. This terminal emphasis has led to valuing what students do not during instruction - the actual active interaction between teaching-and-learning process - but what they do after that process - its product. With their attention riveted to student achievement, evaluators have tended to overlook *process*, because the really important data for them, the *product* data, would be available only at the end of instruction when student behaviors could be checked against the objectives. The result of this focus is to divorce evaluation from instruction. This separation is based on the assumption that we must always teach first and evaluate later and that, as a technical activity, assessment of "learning" divorced from "teaching" can be planned and administered from a national center. This problem is typical of Tyler's rationale, which is unilinear in its procedures.

Eisner (1972) questions the assertion that objectives must be identified at the start. He distinguishes between the logical and psychological development of a course of study. Although it seems logical that a person should know where he is going when he embarks on a trip, it is often not the most psychologically satisfying way to travel. It is often more exciting to leave some of the itinerary unplanned or to change it when more interesting alternatives are discovered.

Aoki (1974) questions the notorious stance of linear programming and the tendency to reduce instruction to the testable. He believes that some existential relationships between student and teacher must be established to allow learning to be experientially exciting and meaningful. With such a situation it may well be that uncertainty, unpredictability and uncontrollability, are critical ingredients of excitement.

Aoki makes a case for objectives to be viewed as manifestations of transactional modes, as modes of being-in-the world as each student transacts with his or her significant action world. The critical feature of this orientation would not be detachment between the learner and the teacher resulting from emphasis on objectification, but rather intersubjective, transactive interdependence of teacher on student and student on teacher. Here it may be more significant to look not at human *behavior* as such but rather at human *acts*. Unlike the views which equate behavior with acts, Aoki makes a distinction between them. Typical behavior is viewed as a link in a causal or functional chain possessing antecedents and determinants, whereas acts can be viewed as being intentional goal-directed or aimed at something and as representing a life plan of some sort. He suggests that another way of specifying the outcomes of instruction, which departs from the notorious stance of unilinearity, detachment and objectification may be in an analysis of an anticipated "instructional dialogue." That is, an analysis of instructional situations should include both the intended and unintended outcomes. Hence, an alternative way of describing objectives may be to typify the transactional phenomenon of a person's life-mode.

Terminality of evaluation is mainly due to the belief in transfer of training and application of what a student has learned during instruction: that the student must apply himself or herself in a new situation. "Specifically stated evaluation should measure how well a pupil can use information and skill in different situations" (Shomburg and Sheridan, 1970, p. 32). This psychological principle suggests that a test of learning is what the individual can do with input in a different setting. Terminal tests and examinations are associated with this principle of transfer or application of what is learned to novel situations.

It may be possible that terminal tests and examinations engage students in application of what they learn during instruction. Besides, application is a key inquiry process that needs to be fostered. But the concept of application as used in this sense seems to derive its meaning essentially from the ethos of academic rationalism: application means the student's ability to reproduce the product of inquiry - that is, funded knowledge taught - on the examination sheet in a controlled examination setting. It is application in a sense that a student regurgitates some knowledge learned theoretically by rote memorization. Such application has nothing to do with the application of learnings in real-life situations or even reproduction on paper of what is learned in such situations. There is no single question in the past geography examination papers which requires a student to describe or explain how he or she applied a particular kind of knowledge in a real-life situation or to give an account of the process he or she used to arrive at a particular result or product and reflect on both process and product of his or her own effort. Analysis of the past papers also reveals that the knowledge actually examined is the same year in and year out. This characteristic is a feature of academic rationalist curriculum which, as we saw earlier, assumes that disciplined content is objective and thus "correct," "pure," and "durable." However, inquiry-oriented application of learning has to promote the student's ability to identify and solve real-life issues and problems in a real world situation by applying whatever knowledge, skills or dispositions relevant to the resolution of that problem, rather than having students engage in mere hypothetical or simulated situations and purposeless and thoughtless regurgitation of memorized disciplined knowledge for its own sake.

Terminal tests and examinations have been defended by being seen as "motivators," but they only motivate extrinsically, rather than intrinsically, and often in fact act negatively as "punishers." Since they are terminal, they come so late that they hardly reinforce desired responses, and inculcate the hidden curriculum that education is a terminal process. The traditional rewards - letters and numbers - do in fact jeopardize

students' and teachers' pride for their own creative and thoughtful accomplishments. They represent nothing else but the ability to cram and reproduce funded knowledge - the "truths" of subject specialists. Moreover, in real-life situations - parents rewarding their children, for example - we do not reward by numbers and letters.

The principle of congruence means that there should be a one-to-one matching relationship between the behavioral objective (input into the instructional system) and student terminal performance (output). Such congruence is only possible with a knowledge-laden curriculum in which testing of the testable is the only goal. When this matching exercise translates into teaching in the classroom it amounts to the belief that a teacher should administer tests and examinations to ascertain the degree to which the input equals the output. In terms of pedagogy, it translates into a questioning technique based on the mode: "the teacher asks; the student answers." Basically, such questioning serves a terminality function because a teacher examines as he or she teaches the extent to which students have "learned" that knowledge which he or she has "taught." The central function of the *question* here is to help a pupil remember and tell what has been taught rather than question it. During classroom observations, virtually all teachers used the question in this fashion. Teachers spent vas amount of time coaxing pupils to answer questions either from themselves, the textbook, or one written down in terminal assignments. Not a single teacher devoted time to encourage children to construct and ask questions about what they had learnt, were learning, and would learn.

Underlying the congruence-measurement paradigm is the belief in the separation of "evaluation" from "decision-making," and thus from evaluator and decision-maker. Stufflebeam et al (1971) and Stake (1973; 1972), for example, illustrate the advocacy of this position when they insist that the role of evaluator is only one of facilitating judgment by others rather than rendering judgments himself or herself. Stake argues that the evaluator who does participate in decision-making destroys his or her objectivity and hence, his or her utility. There has been a counter argument to this stance. Scriven (1972; 1973), for example, maintains that the evaluator must make the judgment of merit. He regards the evaluator who refuses to engage in decision-making as having abrogated his or her role.

In Tanzanian situations, a teacher is, strictly speaking, neither an evaluator nor a decision-maker. In the field of evaluation a teacher is merely an *agent* of testing for the Council rather than a collaborator. What a teacher does is to prepare and administer the instruments determined by NECTA's evaluators. As it has been shown, the final data used in the decision-making was being standardized and therefore stripped of the assumed teacher subjectivity. In the final analysis, such data can not be said to be teachers' data or reflect their thinking in evaluation. Teachers are simply subordinate implementers of decisions from the top. Students, on the other hand, are the target population of instrumentation; they are "subjects" to be manipulated in the process of data collection; they are the basis for decision-making.

Related to the distinction between evaluation and decision-making is another traditional dichotomy between "evaluator" and "evaluated" which is also related to the top-down mode of decision-making and administration. Real evaluators constitute the Council's staff and inspectors of schools who regard teachers and students as "out-theres" to be observed and evaluated and to be made to accept that role without questioning why or asking why they should not also evaluate the evaluators and decision-makers. In the final analysis, however, students are the most disadvantaged and the most downtrodden in the field of evaluation and decision-making. Unlike teachers, students have no place at all in this activity.

In the classroom, students were the only members of the instructional context who were being evaluated. Both classroom observations and interviews with students confirmed that they were the students who were always being evaluated. Throughout all observations in all secondary schools there was no single instance in which a teacher allowed pupils to evaluate his or her teaching, content taught, or whatever. There is of course a temptation to blame all this on teachers. Yet the real problem is the "backwash effect" of the Council's beliefs and practices in evaluation. The overt and hidden curricula of the Council's evaluation guidelines to schools and teachers colleges inculcate the belief that they were only the students who had to be assessed by teachers and tutors, and that the converse was a taboo. Since its inception, NECTA has never formulated a policy or guidelines intending to involve students in evaluating their own learning or the performance of their teachers and others who influence teaching and learning. When pupil interviewees were asked to say how they were being involved in evaluating their own work, the work of their colleagues and of their teachers, they said they had never been involved in such activity. Only occasionally a rare teacher would have pupils mark their own work in the classroom but even this activity would mainly be done as a summative evaluation. Also, [illegible] interviewees agreed that they never gathered data from their students about the effects of their instructional practices, curriculum and other aspects that affected the learning of their students. In some schools, teachers and heads of schools were in fact eager to learn that I was going to interview students. "What are they going to tell you?" or "Headmaster wondered. The overriding attitude of some of these teachers and heads was that the only business of pupils in schools was to be fed with what to learn and pass examinations.

The assumption that only the student should be evaluated must have aggravated teacher invisibility, which also makes it difficult to evaluate the teaching process and to use collaborative methods of teaching. The invisibility and "independence" of teacher performance, which is the result of the culture of conservative individualism, may have been a powerful force to maintain the status quo. The academic rationalist socialization of teachers into becoming authority figures that they should only deal with subject matter in which they have special expertise may have helped to create a social hierarchy of power and authority in the classroom in such a way that it was impossible for students to evaluate the teacher or challenge that hierarchy as well.

I have argued that academic rationalism embraces the "producer-consumer" business metaphor. This notion also manifests itself in evaluation thinking and practice. Indeed, Scriven's (Worthen and Sanders, 1972, pp. 28-48) distinction between "formative" and "summative" evaluations seem to have originally been necessitated by the need for promoting profit-oriented educational projects to produce a compendium of program materials for commercial purposes rather than for genuine concern to facilitate student learning. According to Scriven, the role of evaluation was to arrive at the judging of the merit of an educational program for producers (formative evaluation) and consumers (summative evaluation). Formative evaluation was used to improve the product of the program while being developed by the producer, and summative evaluation was intended to be conducted on the completed product, aimed at the potential consumer. Cronbach (1972), too, explicates the business metaphor in educational evaluation by stating that "evaluation, used to improve the course while it is still 'fluid,' contributes more to improvement of education than evaluation used to appraise a product already placed on the market" (p. 64).

In Tanzania, the business metaphor has been keenly built into the processes and procedures of developing primary and secondary school textbooks suggested by the World Bank (1991). The Bank not only advocated evaluating the prototype materials rubber-stamped from imported ones, but also went as far as imposing procedures of their

publication and distribution in anticipation of international market of such materials produced under its financial support. This way the school system is used as a testing and refinement ground for materials already on the market and a marketplace at the same time. "Zim-Sci kits," which the Bank wanted to be reproduced for Tanzanian secondary schools were already on the market in Africa. The Bank wanted Tanzania to use the loan to import these kits and other materials, negotiate rights for them and have them reproduced wholesale, tried, evaluated, revised and so on. This process had to begin in 1990 and end in 1996. Throughout the stages proposed by the Bank to reproduce and install these kits and other materials, formative and summative evaluation were supposed to be used in a manner stipulated by Scriven. The role of production was given to the ICD specifically and MOE headquarters generally. To enable teachers to become efficient consumers of these materials, the Bank agreed to pay for "training teachers in the use of newly developed materials" (World Bank, 1990, p. 32). Reading through Annex 15 and other sections of this Bank's report, one sees the dominance of Tyler's end-means approach to evaluation, the use of the R.D.D.A. (Research, Development, Diffusion and Adoption) model (Aoki, 1983, p. 8), and all the concomitants of the process of installing the curriculum into schools from the top. We can also note here the influence of the culture of silence on the part of Tanzanians who were involved in endorsing these agreements and were supposed to see through the hidden agendas of such arrangements.

EXAMINATIONS AND ACADEMIC SUBJECTS

From the introduction of this chapter it can be seen that, basically, evaluation in Tanzania has been modeled on the British system of evaluation; though, as we have observed, other schools of thought, particularly those from North America, have also influenced the thinking and practice in this field. The structure of NECTA and nature of national examinations all reflect the British connection of examinations and academic subject, a legacy of the grammar school system. This legacy can be traced to some extent in the 1947, 1955, and 1973 geography syllabi (Mbeo, 1975) which reveal a close relationship between examinations and academic subjects.

Goodson (1983) provides a historical background to the emergence of the direct connection between 'O' and 'A' level external examinations in British secondary schools, and the associated assumption that "able pupils" are those who can pass these examinations which are based purely on the academic tradition. In Britain, the connection between the subject taught in school and external examinations was established on the present footing with the birth of the School Certificate in 1917. From this point on, the conflict over the curriculum began to resemble the contemporary situation in focusing on the definition and evaluation of examinable knowledge. The School Certificate rapidly became the major concern of grammar schools, and the academic subjects it examined soon came to dominate the school timetable. A certain sameness in the curricula resulted from the double necessity of finding a place for the many subjects competing for time in the curriculum and the need to teach these subjects in such a way and to such a standard as would ensure success in the School Certificate examination. As a result of "these necessities" the curriculum had settled down into an uneasy equilibrium, the demands of specialists and subjects and examinations being nicely adjusted and compensated. The academic subject-centered curriculum was strengthened in the period following the 1944 Education Act. The introduction of the GCE (General Certificate of Education) in 1951 allowed subjects : ' be taken separately at 'O' level, and the introduction of 'A' level increased subject specialization in a manner guaranteed to preserve if not enhance the largely "academic" nature of the "O" level examination. There was little chance that a lower-status examination such as the Certificate of Secondary Education (CSE), which

was introduced in 1965, would endanger the academic centerdness of the higher status 'O' and 'A' levels.

The hegemony of the academic subject-based curriculum for 'O' level and 'A' level candidates was confirmed by the organizational structure of the Schools Council. The Secondary Schools Examination Council set up in the interwar years to ensure uniformity of examinations, mainly at 'O' and 'A' levels, used a subject-based organizational framework. When the Schools Council was formed, it was based solely on the structure of the Secondary Schools Examination Council, which had already developed a pattern for examination in academic subject. It was also the same structure that was being used by Tanzania's NECTA.

Goodson (1983) finds that, in Britain, accepting this structure of academic subject examinations, interest groups promoting new subjects have focused since 1917 on the pursuit of high-status examinations and qualifications. Subjects like art, woodwork and metalwork, technical studies, book-keeping, typewriting and needlework, domestic science and physical education have consistently pursued status improvement by arguing for enhanced academic examinations and qualifications. But, as in Tanzania's case, few subjects have been able to challenge the hegemony of the academic subjects incorporated in the 1904 Regulations and 1917 School Certificate. Goodson finds that the academic tradition successfully withstood the waves of comprehensive reorganization and associated curriculum reforms. The interconnection of academic subjects and written external examinations has come to mean that questions of a theoretical base or methodological perspective have often been subsumed by or channeled into the construction of acceptable written examinations. A central curriculum concern has been whether the subject's content could be tested by written examinations for an "able clientele." Acceptance of the criterion of examinability affects both the content and form of the knowledge presented but carries with it the guarantee of high status.

As it has been shown, the academic tradition which roots in the ethos of academic rationalism is content-focused and typically stresses abstract and theoretical knowledge for examinations. That the whole of the Tanzanian evaluation system is based on this ethos which was inherited from Britain cannot be denied; and, the system continues to reproduce itself. The way it tended to hamper the development of an inquiring mind has been explored. Educational evaluation is another field where the success of the development of an inquiring mind will depend primarily on a change of our attitudes and what we believe about this process regarding curriculum development, teacher education, teaching, and learning.

SUMMARY

This chapter has explored evaluation factors that may have influenced the development of an inquiring mind in Tanzanian secondary schools. Areas which have been looked at include a background to the evolution of evaluation in Tanzania; how the power of examinations influence teaching and learning generally, and their roles; continuous assessment; the nature of tests and national examinations; the effect of examinations on the production and use of teaching and learning resources; the congruence-measurement paradigm; and the relationship between examinations and academic subjects.

It has been shown that the evaluation thinking and practices were basically rooted in congruence-measurement paradigm which is itself based on behaviorism and academic rationalism. One of the major consequences of this situation is that the whole system of

evaluation makes curricula, teaching and learning to be geared absolutely to tests and examinations that assess nothing else but funded knowledge of the established academic disciplines. Tanzania's examination system, like its curriculum, is basically a legacy of the British academic rationalist educational system. For successful development of an inquiring mind in Tanzania, we need to break away from the yolk of this traditional ethos in education. This will partly require a change in the attitudes and values we hold about educational evaluations.

CHAPTER NINE

THE SOCIAL, ECONOMIC, POLITICAL, AND CULTURAL FACTORS

INTRODUCTION

This chapter looks at some of the social, economic, political, and cultural factors that may have influenced the development of an inquiring mind. The discussion focuses on the language problem in relation to the medium of teaching and learning, governance, the problem of equity, the economic situation and provision of educational resources, and the intellectual ethos of foreign aid. The sources of information include interviews, documents, classroom observations and my personal observations and experience.

THE LANGUAGE PROBLEM

The Language Policy

The language problem was among the most critical obstacles that substantially hampered the development of an inquiring mind in Tanzanian secondary schools and possibly in all educational institutions in this country. Very briefly stated, the extant language policy in education at the time of field research consisted of:

(1) teaching Kiswahili as a subject to all pupils at primary and secondary school levels;

(2) teaching all subjects, except English, in Kiswahili at primary school level;

(3) teaching siasa (political education) in Kiswahili at secondary school level;

(4) teaching education in Kiswahili in teachers' colleges; and

(5) teaching all the other subjects in English at secondary and tertiary levels of education. Kiswahili was also being used as a medium of instruction in the Kiswahili Department of the Faculty of Arts and Social Sciences of the University of Dar-es-Salaam.

Before independence in 1961, the status and roles of Kiswahili and English in Tanzania were clearly defined. Kiswahili was a cultural and commercial language. It was also the language of African politics, of education mainly up to Standard 6 and partly up to Standard 8, and of lower administrative levels. English was the official language and administration at higher levels, and the language of education from Standard 7 to tertiary levels. As a language of the colonial master, English held very high status in the education system and was conditional to getting a Secondary School Certificate of Education (SSCE) from the Cambridge University Examination Syndicate, and therefore a determinant for one to get better employment or be promoted to higher education levels. A student who secured all required credits to get first class but failed English was awarded a General Certificate of Education (GCE) instead of SSCE and was passed at third class level. Besides, English was an instrument of socializing the very few people who were used by the colonizer to serve the interests of the colonial state, rather than to educate the citizenry to become literate, critical, and reflective inquirers who would become masters of their own destinies. In other words, English was the language of the very few people who were lucky to receive formal education beyond Standard 6.

After independence, there was a pressing need for the provision of education at mass level. Education was not merely seen as a gate to white-collar jobs, but as a means to achieve freedom and unity, liberation, democracy, equity, dignity, progress and humanization of Tanzanians. It was Kiswahili language that would help serve these functions from grass-roots level, aided by English and other indigenous and international languages. As a result, since 1965, Kiswahili became a national language and assumed some of the official functions of English, which also remained an official language. In 1968, Kiswahili was declared the language of all primary education. At the secondary school level, Kiswahili was made a compulsory subject and a condition, along with Siasa (Political Education), for a pupil to qualify for an award of a certificate for Secondary Education Examination (CSEE). By 1971, Nyerere (1971), the then President of Tanzania declared that "our national language has been given the importance in our curriculum which it needs and deserves" (p. 49). The use of English as a medium of teaching in secondary schools was seen as a necessary, but temporary measure, that the eventual complete adoption of Kiswahili in the education system was just a matter of time. In fact it was hoped, as indicated in the Second Five Year Development Plan, (Ministry of Economic Affairs and Planning, 1969), that by 1974, Kiswahili should have taken over that function from English language.

These language policy decisions enhanced the status of Kiswahili as a teaching language, and contributed directly to its subsequent rapid expansion linguistically and geographically. The decisions, however, led, as a consequence, to the decline in the status and prestige of English in Tanzanian society and in its mastery among Tanzanian students. Adoption of Kiswahili as a teaching language at primary school level led to the loss of *linguistic continuity* between the end of primary schooling and the beginning of secondary schooling. The few pupils who were promoted to Form 1 had to grapple with an unaccustomed, practically alien medium even as they struggled to master the new concepts. The result was a pedagogical absurdity. A linguistic discontinuity, probably with similar effect, prevailed regarding diploma teachers who learned education in Kiswahili and upgraded to BA. Ed or B.Sc. Ed at the university where education was taught in English.

The decision to use Kiswahili in primary education had two implications: (a) It implied that the change in the language of teaching would be carried through to secondary and, eventually, tertiary levels. (b) It also implied that, in the meantime, the English language would be taught well in primary and secondary schools so as to enable the students to cope with teaching and learning and the readings that were still in English.

The government responded to this situation by proposing a program of gradual replacement of English with Kiswahili, starting in 1971. According to the program, the following subjects were to be taught in Kiswahili with effect from the indicated dates: (1) History, 1971; (2) Geography, 1971; (3) Political Education, 1969/70; (4) Mathematics, 1971; (5) Agriculture, 1971; and (6) Domestic Science/Home Economics, 1971 (Mulokozi, 1989, p. 4). Except for Political Education, this proposal was not implemented. Nevertheless, Mulokozi (1989, pp. 4-6) has documented a trend about how research and preparation for the changeover continued from 1970 to 1988 by educators and government institutions. At the time of field research in 1990/91, the Ministry which was responsible for Culture and the National Kiswahili Council of Tanzania were conducting a project of translation of secondary school textbooks into Kiswahili, a project initiated by the government in 1988. Indeed, much has been done in the technical and professional field since 1968 to enable Kiswahili to become the medium of teaching in secondary schools. In 1982, the Presidential Commission on Education (the Makweta Commission) recommended to the government (a) the adoption of Kiswahili as the medium of teaching in secondary schools from 1985; and (b) strengthening of

teaching of English in primary and secondary schools. The first recommendation rekindled the tempo by educators and scholars to prepare for the changeover. Despite all these, the commission's first recommendation was rejected, and the second accepted by the CCM Party and Government. To date, the changeover has not happened. English continues to be the medium of teaching and learning disciplines of knowledge in the secondary school system.

The Language Problem in the Classroom.

Evidence from classroom observations, interviews with teachers, pupils, heads of schools, inspectors, and other administrators revealed that very little learning was taking place in secondary school classrooms, mainly because both the teachers and the pupils lacked enough competence or proficiency in the English language. Indeed, interviews with tutors and other participants indicated that this problem existed even at teachers' college and university levels. It was a very serious national problem, both pedagogically and politically.

During the classroom observations, I observed that teaching in Forms 1 to 4 was usually bilingual, in both Kiswahili and English, particularly in Forms 1 and 2, where Kiswahili tended to take an upper hand. Many pupils simply were not fluent in English, and almost all teachers felt at home with teaching in Kiswahili. The classrooms could be seen literally struggling with English language. Those teachers who tried to use English in most of their teaching read everything from their lesson notes and followed their lesson plans to the letter. Some teachers assumed subject ignorance when English was the real problem. Student self-expression was constrained in English. Most students kept quiet, as they were embarrassed to speak aloud and risk teacher and pupil ridicule. When the pupils spoke, they only responded to teacher questioning with a very short answer consisting of a word or two or merely "yes" or "no" responses; even written responses consisted of similar short answers. The only lively discussion was done in Kiswahili. A participant who had made numerous classroom observations in secondary schools and teachers colleges as a teacher educator of undergraduate students stated:

> In political education classes, there is more lively discussion and students put forward searching questions partly because Kiswahili is used as a medium of instruction to teach this subject in secondary schools and teachers colleges. In subject where English is a medium of instruction - the rest - the students are hampered in their subject because of this medium of instruction and expression. They find it very difficult to express themselves in English.

The whole class could consist of not more than five pupils who tried to give longer answers, and these were pupils who were fluent in English prior to secondary school entry and were at a definite advantage with regard to school performance. A pupil participant who had attended English-medium primary school felt he was at an unfair advantage because teachers and the whole school context provides no models for him to maintain the level of English he had when he began Form 1, let alone improving it. "I am better than most of my classmates, but I am not improving my proficiency in English," the pupil lamented. Most teachers could not speak English fluently, particularly diploma and certificate holders. There were very few model teachers from whom pupils could learn good English. Even expatriate teachers provided no such model, as most of them came from non-English speaking countries. In the schools visited, only one expatriate teacher came from USA and was a science teacher. Others came from India, Germany, and Nordic countries. Only one school had been included in the English Support Project,

a program which had not yet had a noticeable effect on the quality of teaching and learning English. Thus, pupils were being exposed to numerous English language errors everyday from teachers, books, pupils themselves, and the larger community. English language was a real barrier to communication and understanding of what teachers taught and what pupils learned.

All participants reported that English was poorly taught in both primary and secondary schools and that teacher education institutions were unable to prepare teachers who would teach it effectively. Tutors admitted that their student teachers and even themselves had poor command of English. Like secondary school teachers, tutors also mixed Kiswahili with English when teaching academic subjects in which they were supposed to use English only. This problem of expression was particularly more serious for tutors holding a diploma and teaching certificate, who, due to shortage of graduate tutors, were teaching diploma student teachers for whom they were not qualified to teach. At university level, a compulsory "Communication Skills" course was introduced for all undergraduate students in the early 1980s, as a remedy to the poor English proficiency of university entrants from Tanzania high schools and other institutions. At this level, too, there was the English screening test which was administered to all first year students. Those who scored very low marks had to undergo an Intensive Grammar Program. The purpose of this communication skills course was "to improve students' language skills so that they may learn more efficiently through the medium of English, communicate more effectively in their specialist subjects, to extend their skills of listening to lectures, taking notes from lectures and books, and organizing written work" (Mongela, 1989, p. 1). During classroom observations, both graduate and diploma teachers mixed Kiswahili and English not only to enable pupils to understand, but also because teachers had problems expressing themselves clearly in English.

Studies Done About the Language Problem

Several studies and reports (Criper and Dodd, 1985; Schmied, 1986; Trappes-Lomax, 1986; Yahya-Othman, 1987; Mulokozi 1989; Lwaitama and Rubagumya, 1989) which have addressed the language problem in education in Tanzania have come up with similar findings. A study by Cripper and Dodd (1985) of the teaching and learning of English and its use as a teaching medium throughout the education system found that two thirds of Standard 7 pupils were unable "to read and understand any connected text" (p. 14). Moreover, "Ninety-five percent at least of primary school children have not yet started to master any English notwithstanding the five years that they have been learning English in school" (p. 14). By the second term of Form 1:

> Sixty percent are still at the level where they could read only 500 word picture books. There is no way that such pupils could follow instruction in other subjects through English (p. 14).

Halfway through Form 4:

> the number getting within reach of being able to read easy unsimplified texts is less than 10 percent. It is extremely worrying to find that nearly one third of all pupils are still at the picture book level after four years of official English medium education. These results are a clear indication that throughout their secondary school career, little or no subject information is getting across to about fifty percent of pupils in our sample. Only about

> ten percent of Form 4s are at a level at which one might expect English medium education to begin (p. 14).

These results suggest that little or no learning was taking place for the majority of pupils in secondary schools or alternatively that the English medium was not being strictly applied. Whatever the case, the use of English has led to superficial or complete lack of understanding of what was taught and learned. This problem in turn induced mere lecturing and blind copying and memorization of the information, only to be regurgitated during examinations and tests. This language problem may also have affected students' and educators' self-study and use of available resources. All pupil participants said they were unable to read and comprehend clearly the information contained in the textbooks and other reference materials, particularly the imported ones. The language problem may partly explain why, in all schools, most textbooks, new and old, and other teaching materials were kept unused in stores and elsewhere; and inappropriate use of libraries, their absence or closure in some schools. All diploma teachers admitted that they found geography books which had been secured from abroad difficult to understand, and also remained unused. But some of these books contained inquiry-oriented activities, which went beyond mere exposition of information like the mandatory geography textbooks written by the ICD. Of course, the prescription of ICD textbooks and the examination system that tested content in these mandatory textbooks also helped to discourage teachers and pupils to at least attempt to use the imported materials. However, the fact that English was a barrier to students' learning and teachers' teaching has led to the Kiswahili language to "force" itself in the classroom and "invade" the communication there. It was gradually taking over as a medium of teaching and learning in all subjects in a *de facto* manner.

The Debate On The Language Problem

The decline in students' and teachers' English proficiency with possible consequent low cognitive achievement, and the government's decision to continue with English as a medium of teaching, unleashed a heated debate between the governmen. and its supporters on the one hand and those who preferred Kiswahili to become the teaching medium on the other. The main arguments and counter-arguments (Mulolozi, 1989; Lwaitama and Rubagumya, 1989; Mongela, 1989; Sunday News, June 2, June 16, June 23, 1991) are summarized in Figure 10 below.

Figure 10: The Debate on the Medium of Teaching and Learning.

1. English is an international language which Tanzanians need when they go abroad to study, to attend conferences and the like. Students will never be able in the future to solve international matters since they will not be conversant with English.	(a) Not less than ninety percent of all secondary school learners will probably never go abroad, but will need and use Kiswahili in their daily lives. The "working knowledge" - "knowledge-in-use" which the majority of Tanzanians depend on in their day-to-day lives and workplaces is in Kiswahili rather than English. (b) Students who go abroad to non-English speaking countries have to learn the languages of the countries where they do their studies (such as French, Russian, Chinese, etc.). English is not enough. Besides, in Tanzania there are more foreign expatriates from non-English speaking countries than there are from English speaking ones. A general survey of countries that had supported Tanzania's major development programs in the 1980s supports this observation (Baregu, 1988).
2. English is the language of Science and Technology; thus poor proficiency in the language will hamper the transfer of Science and Technology from developed countries. Tanzania needs to "catch-up" with the rest of the world in scientific and technological development. In 1983 the Minister for Education said, "We must learn from foreign nations and in order to do so we must use English to promote understanding [of what is learnt] in schools." The most cost-effective means of getting access to scientific and technological advances in the world as a whole is to have as many Tanzanians as possible acquire adequate levels of fluency in English for the purpose.	Every language in the world is, and has a right to become a language of science and technology for its users. Kiswahili is currently serving this function in Tanzania's economy and places of work and its role in this regard is growing daily. It is precisely because many people in Tanzania including students perceive Kiswahili as a language of "real life chances" that they find English of less value to their day-to-day living. Tanzanians working in fields of science and technology needing good English fluency have and will be given the opportunity to study English and other relevant foreign languages.

3. English will die out if it is eliminated as an educational medium, for there would be no incentive to learn it.	It is erroneous to assume that adequate levels of fluency in English for the purposes of getting access to scientific and technological advances in the world as a whole cannot be achieved if English is not used as a medium of teaching. People in other parts of the world master foreign languages without having to use them as media of teaching. In any case, English will and should continue to be taught seriously in all Tanzanian schools and other educational institutions.
4. Kiswahili lacks the necessary terminology, books and specialists. Scientific and technological terminologies are difficult to translate into Kiswahili. Kiswahili has not developed enough vocabulary for such complicated subjects.	The technical aspects have to be created through conscious policy, planning and deliberation. Without a felt need, they will not just come about. Besides, every language which is "alive" is growing and borrowing from other languages, and Kiswahili is no exception
5. Kiswahili is already well established; there is no need to worry about it.`	If it is well-established, let it be used as a medium of education in secondary schools and higher education, and for science and technology, and stop complaining about its lack of terminology, precision and the like.
6. Use of Kiswahili as a medium of teaching has led to a drop in education standards in primary schools and consequently in secondary schools. To raise the standard of education, English should replace Kiswahili as a medium of education in primary schools.	On the contrary, it is the use of English, coupled with other socio-economic and pedagogical factors, that have led to the alleged fall in standards. Indeed, Kiswahili is not yet the official language of teaching in secondary schools. Furthermore, it is difficult to envisage a situation whereby the currently acknowledged inadequacies among students and educators in the mastering of English language as a medium of teaching and learning would be eliminated in the foreseeable future. The political, economic and cultural trends in Tanzania would appear to have set in motion the process leading to English ceasing to be a viable medium of communication in the educational system as a whole.
7. We are a democratic country; everybody should have access to English.	For that very reason, we should democratize our education through the use of Kiswahili, a language which is familiar to the majority. Everybody has also the right to choose to have access to languages other than English.

8. (a) Where is the money? Where are the resources to meet the costs of the changeover? (b)The government can't print enough Kiswahili books for all secondary schools in Tanzania (c) Most books which are ordered by the government from abroad are written in English; the government is not able to print its own books.	If we accept Kiswahili as our national language, it behooves us to give it the resources to match that status. Whereas local publishing in English is difficult, foreign currency would be required for the importation of books and other teaching materials and thus dependency on foreign resources may prove unsustainable. The shortage of teachers and teacher educators with the requisite knowledge of English is likely to be exacerbated by the political impossibility of stemming the tide of the proliferation of secondary schools. Unless this "mushrooming" of secondary schools is matched by appropriate teacher education, which is not the case at the moment, the problem of teachers who are not proficient in English will remain. This problem is already very serious in private secondary schools and is getting worse in newly opened public "community" secondary schools.

The Cause of the Language Problem

Several Tanzanian educational analysts (Mbilinyi, 1975; Lwaitama and Rubagumya, 1989; Mulokozi, 1989) find that the language problem in Tanzania is not basically pedagogical, but a political issue. Mulokozi (1989) believes that "the biggest obstacle to the adoption of Kiswahili [as a medium of teaching] was not technical, but political, that the Tanzanian ruling class appears to be on the verge of abandoning its historical mission of forging a new nation and a national identity" (p. 2). Mukokozi states:

> One possible reason for the government's failure to implement this process is that the (bourgeois) ruling class in Tanzania is still divided on the issue. The patriotic faction of that class favors Kiswahili, but cannot implement its wishes because it is already losing ground in the political and economic fronts. The compradorial faction, with the assistance of the IMF, seems to be in ascendancy. This class needs English to enable it to divide and rule the people internally and to facilitate its integration into the world capitalist system externally. The question of which faction among the two will win is as yet undecided (p. 10).

Lwaitama and Rubagumya (1989) find that Tanzania would appear to be facing a crisis in language policy formulation which some observers may find hard to understand. On one hand Tanzania is often cited as an example of a country in Sub-Saharan Africa which is an exception (together with Somalia and Ethiopia) to the rule that "foreign colonial languages are more favored now than they were before independence" (Mateene, 1980, in Phillipson et al. 1986; p. 91). Tanzania is seen as a country which has opted to promote the widest possible use of an indigenous language. On the other, Tanzania has, especially since 1983, opted to rationalize (like every other Sub-Saharan African country)

the continued use of a "colonial language" as a medium of education at the secondary and tertiary levels. Tanzania's current language policy in education is essentially based on the assumption that it cannot develop socially and economically without close linguistic links with a former colonial power, and that "transfer" of science and technology cannot take place without English being used as a medium of instruction. Lwaitama and Rubagumya believe that African countries are actually unlikely to develop if they continue to rely to a very large extent on technical assistance from former European colonial powers. Current political and economic trends in the world dictate a reappraisal of past language policy options which did not give due weight to the need for *diversification* in international contacts and the intensification of efforts to develop indigenous capacities. Lwaitama and Rubagumya suggest the teaching of languages other than those of their former colonizers, and the dissemination of information including that on science and technology in indigenous African languages, that is "in languages in which most of their people are most fluent." (p. 11).

Mongela (1989), however, favors the adoption of English as a medium of teaching and suggests the following:

> My suggestion here is that, in such schools, the subjects which are not very important at secondary school's level should be replaced by English period. These are cookery, sewing, typing and music. Centers for these should be established in towns to run evening classes and during holidays for interested secondary school pupils to attend. These should then register for the examination as private candidates if one wants to. The nutrition lessons taught in the Domestic Science could be incorporated in the Biology subject which is compulsory to every pupil (p. 9).

Mongela views the "not very important" subjects, those regarded as of "low status," robbing time for teaching English. Mongela's suggestion is another illustration of the academic rationalist thinking which is opposed to the teaching of vocational, theater, and fine arts subjects.

The language debate continues in Tanzania, and vacillation and ambivalence between acceptance or rejection of English as a language of teaching and adoption of Kiswahili continue to lead to a general ambiguity among Tanzanians about which language should be the medium of education. What is certain, however, is that there was very minimal learning on the part of the majority of pupils through the English medium, and that it was one of the greatest barriers to the development of an inquiring mind in Tanzanian secondary schools. Children could not conceptualize or internalize in English and were forced to cram per excellence the bulk of the teacher-given notes for regurgitation in tests and national examinations. Even those students who passed these examinations did so mainly because of their ability to memorize rather than understand and use meaningfully that knowledge in their lives, most of which they forgot soon after those examinations. The sooner the language problem is resolved the better for the future of the development of an inquiring mind in Tanzanian secondary schools and other educational institutions.

GOVERNANCE

Style of Governance

A number of participants found a contradiction between the goal to develop an inquiring mind and the mode of governance which was being exercised by some key

political and government authorities. The policy of ESR and Tanzanian political ideology had consistently stressed democracy, decentralization of power, equality, and grass-roots participation in development. In practice, however, the political and government leadership seemed to have been too bureaucratic and authoritarian to allow healthy growth of an inquiring mind to take place in society as a whole and in educational institutions in particular.

Participants observed that ESR policy, like other policies and programs, was introduced from above as a political imperative that had to be implemented across the nation without debate, experimentation, and reflecting critically and creatively on the actions and their impact. It was dictated from above as dogma and educators became mere implementors of a given policy that was not meant to be questioned, interpreted, or modified by participants in the light of new experiences and conceptions.

According to Issa Shivji (Family Mirror, June 1992, p. 5), the "Nyalali Report" on the "mono-multi-party" debate acknowledged the authoritarian and largely top-down governance since independence. Shivji wrote that the report said that the style of leadership had largely undermined people's participation in the process of governance; that the ruling party had transformed itself from a political party into a state-party controlling and manipulating all politics; that various civil organizations, pressure groups, and other non-governmental organizations came under the hegemonic control of the party, hence the fall of autonomous trade unions and cooperative movements after independence; that the statute book was full of colonial and post-colonial legislation restricting the freedom of citizens to organize and express themselves, to participate in the affairs of the state, and to criticize people in authority without fear; and that even the enactment of the bill of rights had not significantly enlarged the rights and freedoms of citizens.

A related concern by participants was that most Tanzanian intellectuals or scholars who would have conducted conceptual and other studies to interpret and foster an inquiring mind were largely "barred" from central participation in policy formulation and decision-making. Key positions of authority and power in the Party and Government were mainly entrusted in the hands of cadres whose vision, education, and experience were too inadequate to enable them to read and understand the policies and programs and go beyond the general goal statements of those policies. Although such leadership hardly knew anything about education, they had power to influence it. Consequently, the lowly educated or totally illiterate but powerful leaders developed very strong antipathy against the intellectuals who were derogatorily called in Kiswahili by the former as *"wasomi"* or in Kihaya language as *"nshomile"* (scholars). The marginalization of the intellectuals in the political and government affairs tended to frustrate and alienate them and force them "live" the culture of silence. As a result, they lost interest and were discouraged from conducting research on challenging issues such as the development of an inquiring mind, and only did those studies that would provide them immediate incomes to make their ends meet. Indeed, some bureaucrats not only frustrated and even despised intellectuals but also equated research with spying. Even Nyerere, the former President of Tanzania, noted this problem and expressed the hope "that we shall all abandon the idea that research is the same as spying, or that a researcher is really a person who is contributing nothing to our economy" (Daily News, August 12, 1988, p. 4).

The Military Metaphor

The "military" or "police" metaphor was another issue that tended to conflict with the intent of developing an inquiring mind. Inspectors of schools were seen by most

participants as playing the role of "field force" police rather than that of providing professional guidance and modeling inquiry-oriented practice. A teacher participant had this to say about this issue:

> Another pressure causing teachers to cover the ground of the syllabuses perfunctorily are the inspectors. They are concerned with the covering of the content, no matter how. The more content covered by teachers, the more inspectors appreciate teachers' performance. For them a teacher who finishes covering the content of the syllabus is a good teacher, competent and efficient. Developing an inquiring mind is not their central concern.

Experimentation to translate military metaphor in real teaching practice was introduced in four teachers colleges in Tanzania. Besides teacher education curriculum, student teachers were given military training throughout the course. Diploma teacher participants who went through this program at Morogoro Teachers' College resented military training in teacher education institutions, finding it incompatible with the ethos of the inquiry-based teaching profession. While they found it fit for training smartness and other military-related characteristics, teachers also believed that it inculcated the culture of silence by stressing the blind following of orders and subservience as was the case with colonial education. Besides, this military training was done apart from the normal military service. All diploma teachers who lived this program wanted to see it terminated because it did not only foster commandism and other non-inquiry behavior, but also tended to be undertaken at the expense of teacher preparation time and quality.

Political Education

Related to the extent to which political power and political will could critically affect the fostering of an inquiring mind was the teaching of political education both in schools and teacher education institutions. Political education was a compulsory subject in all schools and teachers colleges. At university level all students had to study development studies. The concern for some participants was that, although political education was a very useful subject, it was at times used as a means for thoughtless political indoctrination. Some participants observed that the urge by politicians to have politics in command and achieve Party supremacy led to excessive politicization to the detriment of inculcation of democratic values that would aid the fostering of an inquiring mind.

An official participant, a former lecturer of education, had this to say regarding the teaching of political education:

> Another thing that can very easily inhibit the development of an inquiring mind is resorting to indoctrination. It means inculcating, pumping or forcing certain ideas and beliefs in somebody. You are not giving him a chance to think otherwise. Thus, political education could have contributed to indoctrination. For, some of our teachers thought that in order to teach political education properly, they had to indoctrinate - to convert somebody into certain political beliefs. And so the student was not left with any chance of thinking otherwise, although in some instances there was freedom of discussion during political periods. If you are not careful, you can turn political education class into indoctrination, where you give a student no chance to think. The teaching of political education could have caused too much indoctrination. And indoctrination can inhibit

> the development of an inquiring mind because you are forcing somebody willy-nilly to accept certain notions and ideas. Indoctrination may have destroyed the development of inquiring minds.

All teacher and pupil participants believed that political education was a very important and useful subject and wanted it to continue to be taught because it enabled them to learn all kinds of political ideologies and economic systems of the world. Yet, they said, the element of indoctrination which was intended to persuade them to accept and follow a particular political ideology blindly was detrimental to the democratic process and the development of an inquiring mind.

These tendencies and several other mistakes made by political authorities in the ranks of the Chama Cha Mapinduzi (CCM) political party gave the socialist ideology a bad name and a consequent loss of popularity and support by many Tanzanians, including some of those who had genuinely supported this ideology. For example, some political fanatics, besides turning specialized classrooms such as geography rooms into meeting rooms for political purposes, went as far as withdrawing and destroying books and other teaching materials they labeled as "colonial" and "anti-ujamaa." Political populism and sentimentalism overpowered and overshadowed the sensibility to keep those documents for research purposes. It is thus not surprising to find that ESR policy was no longer being read and studied seriously and interpreted appropriately by policy makers and educators and educationists. The mode of governance itself has contributed further to the intransparency of the inquiry goal and its critical role in the development of Tanzanian society. As one official observed, an inquiring mind has hardly been a topic of discussion in official meetings and conferences, let alone involving classroom teachers:

> If there could be forums to meet and discuss the concept of an inquiring mind we could come up with some common understanding of it. But such forums can occur when people see the need for them. And I don't think so many people have seen the need for elaborating this concept.

> The type of forums common in the Ministry [of Education] at national, regional, district and school levels are normally administrative or business forums. They deal with issues of day-to-day activities - normal routine sorts of problems in the government. People in such forums do not discuss concepts like the inquiring mind or self-reliance in an academic way. But meetings or conferences held by the MOEC or its departments etc. are not of the academic nature ... So this is a weakness in our educational system. The weakness is that, despite the fact that we have provisions for meetings where ideas could come up, we hardly avail that opportunity to the common teacher or use it to dwell on such academic issues as the development of an inquiring mind.

Furthermore, the code of professional conduct for teachers does not encourage them to become inquirers, rather it stresses the view of a teacher as a subservient servant who simply follows rules without questioning them. The code thus induces the culture of silence which teachers learn to cope with lest they get fired.

The style of governance has provided limited examples for the youth and society as a whole to emulate democratic inquiry-oriented practice in which ideas are critically reflected upon and questioned freely and where the givens are made problematic. If it is true that the practice of the polity and schooling are more determinative of students' values and perceptions than the official ideology, students must have taken their cues

from the reality rather than the rhetoric, which has not matched the deeds. Thus, while Tanzanian people have enjoyed a measure of democratic life, they have at the same time lived an authoritarian element of governance which must have stifled the development of an inquiring mind.

Being a young nation still learning how to become democratic, and the fact that democracy itself is a complex, dynamic concept, Tanzanians can be proud of what they have accomplished. Yet, we have a long way to go in establishing conditions in schools and society which are supportive of democratic development of an inquiring mind. Hopefully, current political trends in Tanzania will result in greater democracy and hence more likelihood of fostering an inquiring mind. Democracy devoid of genuine people's freedom to inquire and express themselves without fear of being suppressed or persecuted is sham democracy.

It may be that an inquiring mind may represent the only defence of the "powerless" against those who seek to dominate them. Dictators have always feared thinking and inquiring people. "Yon Cassius," says Shakespeare's Caesar, "has a lean and hungry look. He thinks too much. Such men are dangerous ... He reads much. He is a great observer and looks quite thorough the deeds of men" (Hawes and Stephens, 1990, p. 76). Socrates was sentenced to die by Sophists in ancient Athens, who regarded him as an opponent of their personal views and ambitions (Boraas, 1922, p. 1-3). Dictators come in many disguises today, from the army officer to the advertising agency, but it is still essential for the individual to "look quite through the deeds of men" and recognize them for what they are.

A related issue is that inquiry can be exploited by the polity and some educators to serve their vested interests and suppress inquirers in the name of developing an inquiring mind. Smyth (1992), for example, explores the "politics of reflection" and argues that the rhetoric of devolution and practitioner forms of knowledge may not be entirely altruistic. Such calls, he suggests, are occurring in contexts that display significant moves to bolster central control; and, far from being emancipatory for teachers, reflective practices entrap them within the polity's political ideology.

School Administration

Secondary education is centrally controlled directly from the MOEC headquarters and is administered directly by the Department of Secondary Education in all matters concerning staffing, curriculum, examinations, and finance. At the school level there exists a definite top-down *hierarchical social structure*. The head is at the top, the pupils at the bottom, and the teaching and working staff members (also stratified) are in the middle.

The school administration, headed by the headmaster or headmistress, is supposed to perform *four* basic related roles. First, is an *administrative role* - to run the school and manage the staff. Second, is a *curriculum and teaching role* - to choose and advise about content and methodology, and to have the heads teach a few lessons in order to acquaint themselves with teaching and related problems. Third, is a *research and evaluation role* - to collect and interpret information about children and teachers and their performance and other issues related to teaching and learning. A fourth role is a *community role* - to establish good relationships with parents, the wider community members, and other agencies such as the mosque, the church, the political and government offices and other institutions.

All evidence points to the fact that, of the four roles, the administrative role predominated the school culture and life and was in all respect fueled by the demands of the political and government bureaucracy. Moreover, courses of heads of schools (and those of principals of teachers colleges) - and there were far too few of them, and some had received none - tended to stress this administrative role, relegating the other three to a strictly subordinate status.

The central bureaucracy tended to control strictly what was going in schools such that the school administration had very limited power and authority to make any significant school-based decisions. All school head participants complained that they had no power to influence substantially the way teaching and learning were conducted in their schools, even if they wanted to. The Presidential Commission on Education itself recognized that essential decisions and services were often delayed as a result of overcentralized control, with the result that: "teachers and other staff think that school heads do not have the necessary authority over their institutions" (Ministry of Education, 1984b, pp. 41-42). A number of recommendations were then made to increase the relative autonomy of school heads and boards in decision-making; but, these recommendations had not been implemented. The school as a whole continued to be dictated from above. As one official participant noted, this problem was "based on the type of mentality or thinking whereby people think that it is only those on the top who can think and generate ideas (the so-called think tank). There is a tendency to fail to understand that actually the best ideas could come from below because they are the people who are doing the activities."

The relationship between most heads of schools and teachers in the schools visited were non-collaborative, and a marked teacher/administrator divide could be seen among them. In most schools, heads kept a distance between themselves and the rest of the school population, and simply issued orders from their offices. In only one school the head looked interactive and dynamic, exchanging ideas freely with teachers and pupils. The national top-down model seemed to have replicated itself in schools. Commenting on this phenomenon, an official participant said:

> The relationship is such that the school is not democratic just as the society is as well. Actually the way the school administration is behaving is a reflection of what is happening in society. Schools are not islands. But we sometimes want to do wonders in schools while the community is actually moving in the opposite direction.

On the other hand, some participants believed that the society outside the school culture was more democratic than school itself. "Schools are still very punitive and custodial. A public school is a government bureaucracy in which rigid orders are the order of the day," an official observed.

The school administration and most teachers wielded great power and authority over pupils, the downtrodden. In all schools, teachers and administrators were expected to have absolute power and authority in the classroom and in the school; pupils were powerless. Comments from various participants indicate that school administration in Tanzania's secondary schools was mainly concerned with maintaining strict discipline and meting out punishments to pupils - in some schools pupils spoke of the "fimbo" (cane in the hand), harsh teachers who caused fear and terror among them; punctuality and abscondment of pupils; teacher and pupil absenteeism; enforcement of school rules and ensuring that day-to-day routine was followed smoothly and according to the laid down timetable, and dealing with normal office work. In few schools pupils said they were being urged to study hard - cramming notes - to pass national examinations well. Life in

school seemed to be a drudgery and was hinged on extrinsic rather than intrinsic rewards, boring, monotonous, formal, impersonal, punitive, externalized, and devoid of creativity and intellectual excitement.

Regarding a curriculum and teaching role, none of the heads of schools taught, though they were expected to teach one or two lessons. One reason that the heads did not teach was that, due to increased enrollments through the double session system, secondary schools had grown so large that the administrative role had overwhelmed the heads' abilities to take other roles. Besides, the school administration regarded this role the sole responsibility of the ICD and inspectors of schools. Consequently, although this role was recognized, it was underemphasized.

The research and evaluation role was also absent in secondary schools. There was a lack of culture of inquiry and experimentation of ideas. True, heads of schools or their assistants collected some statistics which they passed on to the national level, but these activities were viewed as part of the administrative role, done with little or no thought to their educational implications. Besides, such information remained confidential and was not availed to teachers or to be discussed in staff meetings for the purpose of improving teaching and learning.

The community role was also scarcely stressed. In all schools, there were no activities that integrated secondary schools with their immediate communities. There was no indication in the schools that integration existed. The schools were hardly using the community as a teaching-learning resource. Pupils reported the absence of people, including parents, coming to school as resource persons or schools going to the community to use its resources for teaching and learning. The school-community integration spirit that was once high had died out. It was very striking that the question of community integration was not raised by any of the participants. The death of the concept of the integration of the school with the community must have happened several years ago. Almasi (1985), for example, found that in the four agriculture bias schools which he studied:

> school/community integration tended to take place on an ad hoc basis and not through laid down policy statements. School teachers and students were no longer participating in literacy classes. Further, schools in the sample did not operate projects in collaboration with village communities. There was also lack of representation by either side in each others' committees (p. 27).

Although it is recognized that good training and recruitment of educational administrators is fundamental to the quality of education and thus to the development of an inquiring mind, this had not been given proper attention. This problem was, indeed, national. Because of quantitative pressures within and upon the educational system, education officers of all kinds were still being appointed to undertake these crucial roles with not training at the outset and little if any training on the job. All heads of schools agreed that, even when action was taken to mount inservice courses or establish an institution such as the Institute of Management Training for Education Personnel (MANTEP) to provide training for educational administrators, content still tended to address management as a set of instrumental technical skills divorced from the goal to develop an inquiring mind in the institutions they led. All participants including pupils also believed that the appointment system was greatly responsible for recruiting incompetent and mindless administrators and supervisors, especially when appointments were based not on appropriate professional and academic qualifications and experience,

but on patronage, favoritism, nepotism, regionalism, feminism, and such other backdoor means, a phenomenon which contributed further to labor imbalance and its concomitants.

The total effect of these actions was that the administrative practices of secondary school administrators were not supportive of the development of an inquiring mind. Their training and experience had not helped them to take the role of fostering an inquiring mind. Their major role was that of maintaining order, discipline, and stability; keeping peace, and resolving conflicts; and ensuring fidelity of the MOEC's policies and programs. A teacher participant expressed the situation thus:

> The administration of the school does not care about teachers' affairs. The headmaster does not monitor teaching and learning, and if he does, he reads reports and ledgers, but he doesn't talk to us and discuss problems of teaching and learning and how to solve them. This discourages me. I expect my head to solve my problems, but he doesn't. He is interested in other things. Staff meetings are not devoted to academic and professional issues and problems. The administrator is not a source of inspiration for us to tackle such things as the development of an inquiring mind and become creative by writing our own books and conducting innovative projects. The administrative system of the whole ministry is frustrating our resourcefulness.

This scenario was indeed a common phenomenon in all research secondary schools and Dar-es-Salaam Teachers' College.

Teacher Motivation to Inquire

A number of factors contributed to low levels of teacher motivation to inquire. Some of these factors have been cited in previous discussion but will be revisited very briefly in this section .

The basic observation by teachers was that the Tanzanian educational system lacked conditions that would encourage and facilitate teachers' engagement in initiating and conducting inquiry-oriented projects and experimentation. Many factors worked together to hamper teachers from engaging in such activities, and some of them have already been observed. However, one factor noted by teachers themselves was the lack of time to conduct inquiry-oriented activities and projects. They cited heavy workload which was caused primarily by teaching too long prescribed syllabi which led to overcrowded timetables, many periods, and large and overcrowded classes. These overcrowded classrooms were a consequence of increased enrollments through the double session system. The class sizes cited in Forms 1-4 ranged between forty to fifty pupils per class, with an average of forty-five. In one school some classes consisted of up to sixty pupils. (The situation was even worse in primary schools where the class sizes were reported to be between eighty and one hundred pupils.).

Increased enrollments led to an increased number of streams and overuse of physical facilities and lack of space. Dodoma Secondary School, for example, had a total of 22 streams - six in Forms 1-2 and five in Forms 3-4 - with an average class size of forty students per stream; but only three teachers were teaching geography besides teaching other subjects. On the average, each teacher had to interact with about 300 students, about the size of Galanos Secondary School in 1969 where I started my teaching career in 1965. The official class size for Forms 1-4 was thirty to thirty-five pupils (forty for primary school classrooms), which was of course already rather large. The class size

at 'A'-level classrooms was about twenty-five to thirty students, with an average of about twenty students. Teachers reported a workload of thirty periods per week; but, in some schools, this number was as low, for some teachers, as fifteen to eighteen periods per week.

Increased enrollments not only led to big class sizes but also to a loss of teaching time. The effect of double sessions was that, besides enabling rather incapable pupils who could not profit from secondary education to be enrolled, it led to both reduction of the number and duration of some periods which were regarded as of "low status." For example, teachers and pupils reported that the number of periods for geography were reduced from three to two per week and the time was reduced from forty to thirty minutes per period. This reduction of time, coupled with the problems of timetabling and administration, resulted in big loss of teaching time. Pupils estimated that not less than forty percent of teaching time was being lost per week through various ways.

Difficult living and working conditions did not allow teachers to concentrate on their professional matters, and much of their time was spent making ends meet. Long hours of working on supplementary income earning projects led to teacher and pupil exhaustion with consequent lack of time and loss of interest in self-study at home and school and to pursue the slightest research work. Furthermore, lack of basic resources including authentic reference materials, library and other supporting services such as resource centers and professional guidance also contributed to the absence of teacher motivation to inquire. Teachers said that professors, MOEC officials, and researchers visited schools to research them or monitor compliance with government policies and programs, but not to share their professional expertise with teachers and pupils. Lack of office space meant lack of peace of mind for them to seriously study.

Teachers also found the reward and incentive system unfair and discouraging creativity and experimentation. They said people found it a waste of time and energy to engage in innovative projects which would not be recognized or rewarded. Moreover, inexperienced and unconscientious teachers who cared very little about their teaching responsibilities were being paid the same or higher salaries and even promoted earlier than those who showed interest to teach better. "Ability to teach" was not a major criterion of rewarding or promoting teachers. This unfair system led to frustration and some teachers quitting teaching. This problem was exacerbated by bureaucratic, top-down administration at both ministerial and school levels; lack of politicians' support of the development of an inquiring mind as a central educational issue; dependency mentality on the part of both administrators and teachers, and lack of officials' confidence in the ability of teachers to conduct independent inquiries and projects. "It seems the officials have no confidence in our abilities to conduct independent research and projects. They prefer imported books and other materials and employment of foreign experts to do things that we can handle ourselves. As a result, this deprives us of the opportunity to learn how to inquire and use local resources," a teacher complained bitterly. "The way the education system is being handled by politicians and administrators makes it impossible for teachers to develop their professionalism, and in fact it is a self-defeating system," an officer interviewee added. What was encouraging, though, was that most teacher participants were optimistic that most of these other problems would be redressed if the system enabled them to learn to inquire as they taught.

The Policy of Universal Primary Education.

As a result of the 1974 policy of Universal Primary Education (UPE), Tanzania attained one of the highest primary enrollment rates (96 percent of 7-13 age group) in

Africa during the 1970s as well as high literacy rates among the adult population. However, the UPE also spawned undesirable effects: the quality of primary education eroded due to the rapid expansion of primary schools. As Table 6 shows, the percentage of the 14-17 age group which obtained access to secondary education fell gradually because of the deliberate policy restricting expansion of secondary schools and the competence and number of candidates for secondary and post-secondary education declined significantly.

Table 6: Primary Education Leavers and Form One Selection 1963 - 1990

YEAR	STD VI/VII LEAVERS	PUBLIC	%	PRIVATE	%	TOTAL	%
1963	17042	4972	29.2	0	0.0	4972	29.2
1964	20348	5302	26.1	548	2.3	5760	28.3
1965	29367	5942	20.2	2329	7.9	8271	28.2
1966	41083	6377	15.5	2591	6.3	8968	21.8
1967	47981	6635	13.8	2610	5.4	9245	19.3
1968	58872	6989	11.9	2511	4.3	9500	16.1
1969	60545	7149	11.8	3021	5.0	10170	16.8
1970	64630	7350	11.4	3254	5.0	10604	16.4
1971	70922	7780	11.0	3667	5.2	1147	16.1
1972	87777	7956	9.1	4379	5.0	12335	14.1
1973	106203	8165	7.7	4964	4.7	13129	12.4
1974	119350	8472	7.1	5144	4.3	13616	11.4
1975	197559	8680	6.3	5786	4.2	14466	10.5
1976	156114	5659	5.5	6590	4.2	15249	9.8
1977	169106	8706	5.1	7165	4.2	15871	9.4
1978	185293	8720	4.7	8467	4.6	17187	9.3
1979	193612	8908	4.6	6677	3.4	15585	8.0
1980	212446	8913	4.2	7095	3.3	16008	7.5
1981	357816	9178	2.6	7988	2.2	17166	4.8
1982	419829	9241	2.2	8469	2.0	17710	4.2
1983	454604	9899	2.2	9606	2.1	19505	4.3
1984	649560	10077	1.6	11745	1.8	21822	3.4
1985	429194	10881	2.5	12625	2.9	23506	5.5
1986	380096	11721	3.1	15709	4.1	27430	7.2
1987	380758	14626	3.8	18007	4.7	32633	8.6
1988	347978	15675	4.5	20789	6.0	36464	10.5
1989	267744	18551	6.9	23585	8.8	42136	15.7
1990	306656	19673	6.4	-	-	19673	6.4

THE PROBLEM OF EQUITY

Factors that cause unequal distribution of social and economic opportunities also have implications to the type of and access to education to various people in the country. This inequality in turn affects their chances to develop an inquiring mind.

Kurian (1987, p. 1911) reported that, in Tanzania in 1983, 2.3 percent of the national income was received by the bottom 20 percent, while 33.5 percent went to the top 5 percent of the population. The percentage of population in absolute poverty in 1983 was 10 percent in urban areas and 60 percent in the rural areas.

In education, the Ministry of Education (1986, p. 32) reported that of all the students who were going to school in 1985, 96.93 percent were in primary schools, only 2.55 percent in secondary schools, 0.38 percent in teachers' colleges, 0.04 percent in technical schools, and 0.10 percent in universities. Regarding education for women, in 1990 female students comprised 49.5 percent of the primary school total enrollment, 36.4 percent of public and 45.3 percent of the private secondary school population, 42.7 percent of teacher education population in teachers colleges, 6.7 percent of total enrollment in technical colleges, and 18.8 percent of the university undergraduate population (Ministry of Education and Culture, 1991b, p. 35). In 1990 (Uhuru, July 1st. 1992), female teachers in primary schools were 116,000 as compared to 172,000 male teachers. In secondary schools, the number of female teachers was 5,000, compared to 14,000 male teachers.

There were also spatial irregularities in educational opportunities in Tanzania. For example, Malekela (1984) found that there was remarkable regional disparity in secondary school education in 1982. The regions with more public secondary schools also had more private schools and more seminaries. One region which consisted of 5.3 percent of the country's population had 20.6 percent of the country's institutions which offered secondary education. Another glaring regional inequality was that 25.2 percent of all students in the Universities in 1979 originated from one region, whereas another region accounted for only 0.8 percent of the student population (Malekela, 1984, p. 3).

To redress this spatial inequality in education in regional, rural and urban access to secondary education, a regional *quota system* was introduced as a basis to ensure that equity was achieved in the selection of Form 1 pupils. At Form 5 and university levels, a quota system was introduced, aiming at providing more access to female students. With small promotion rates to Form 1 (Table 6), one might expect secondary school students to constitute a higher proportion of high achievers. However, all participants, including pupils themselves, reported the existence of very weak pupils who benefited very little from their studies. Participants reported that some of these pupils were so incapable that they could not even read and write, even in the Kiswahili language.

Although the quota system succeeded in minimizing spatial and even gender inequalities, it also led to the selection of "low achievers" due to a variance in pass marks across the country, which were reported to have ranged between 120 out of 150 marks in some regions to as low as 50 out of 150 marks to others. Consequently, the system left out more competent pupils in regions where the pass mark was higher, and promoted those who were relatively weaker in other regions. With increased enrollments through the double session system, the "catchment area" from which to select such weak pupils has expanded.

Selection of incapable pupils has been exacerbated by corruption, favoritism, nepotism, regionalism, cheating, examination leakages, and the nature of School Leaving Primary Examination (SLPE) which was of the multiple-choice, "objective" type. Some pupil participants believed that some pupils were capable, but low ability in the English language incapacitated them from achieving higher, at least in Forms 1 and 2. In fact, this problem was one of the reasons for allowing Form 2 pupils to repeat once if they failed the Form 2 examination.

Occupational disparity also existed. For example, Mbilinyi (1975) found that a very large proportion of secondary school pupils were children not of peasants, but of wage earners or businessmen. The wage earners were predominantly officer status in the government service or secondary school teachers. It is also possible that a greater proportion of the peasant children came from the richest stratum of the peasant population. Mbilinyi also found that access to primary school had also been unequal in the rural areas. Children of poor peasants were not enrolled in schools, not so much due to school fees, but rather due to the opportunity costs involved in releasing them from their labor contribution on the family *shambas*. So long as small holder agricultural production continued to use the same organization of production with no change in technology and other inputs, this constraint was likely to affect enrollment for the poor peasants.

Some evidence exists to show that the academic rationalist hierarchy of status of subjects (Goodson, 1983) is indeed a class issue, and this also helps to show how vocational subjects have been manipulated to serve the creation of classes in Tanzania. Psacharopoulos (1984, p. 16), for example, found that in Tanzania there tended to be more students from farming backgrounds in agriculturally biased schools than in others. According to him, fathers whose children entered agricultural bias had the lowest income, the highest proportion of farmers, lowest wage workers, and the next to lowest educational level of all fathers. Cooksey (1986, p. 194) found that it seemed that, in reality, a disproportionate number of Form 1 students from backward regions were being shunted into the least "desirable" bias as regarded future academic and/or occupational opportunities and choices. If it is true, as Cooksey (1986) and Mukyanuzi (1985) claim, that cognitive and linguistic gains have been least in the agricultural bias, it follows therefore that pupils in this bias have had the least opportunity to develop inquiring minds. Whether or not this has been the case needs further investigation, but these observations throw some light on the possible existence of the relationship between the hierarchy of the status of subjects taught in secondary schools and the socio-economic status of pupils.

Some practices in secondary schools also reveal class oriented social dynamics. In all secondary schools, teacher and pupil participants said that streams were labeled "bright" and "dull." Individual students and groups within a stream were also labeled bright or dull. Some teacher participants revealed that, in their schools, these ability groups almost corresponded exactly to the socio-economic origin of the children. Then there was a tendency for teachers to concentrate on the "best, "brightest" or "able" pupils who in turn tended to be children of the rich and bureaucrats. There was a belief among some teachers and school administrators that these few pupils would manage to keep up with the flood of content matter to be mastered, and that these were the pupils who counted most. Furthermore, they were the "able" pupils who occupied leadership positions in schools and got favors of all kinds, including borrowing and taking home the only copy of the best reference available in the department which never got availed to the "dull" ones. In two schools, pupils complained that there was favoritism in the allocation of teachers. They said that the most experienced and resourceful teachers were assigned to teach "brighter" classes while "dull" ones were given novice diploma teachers, whom it was believed, were inadequately prepared to teach in secondary schools. In such schools, most experienced and better qualified teachers spent most of their time teaching the "able" and "rich" pupils.

Mbilinyi (1975) also found that class backgrounds of pupils affected school performance and teacher-pupil relationships in countless ways. "Rich" pupils clustered together and indulged in petty ridicule of their poorer schoolmates. Teachers knew when a pupil was a child of a "somebody" or a fellow somebody, and they behaved differently

towards such pupils. Rich pupils got sent to school in private and official vehicles while poor pupils (and teachers of course) relied on inefficient and unreliable public bus transport or walked on foot. They were also the ones who missed most of the classes due to this factor, yet got punished - including being caned - for not being punctual. All these affected student and teacher motivation and relationships in the classroom. The material and psychological rewards offered by the school to its pupils accrued to those who had a "rich" background. Unfortunately, too, academic achievement and success were only measured by passing academic theoretical, regurgitation, examinations, that tested disciplined knowledge.

Most, if not all, these socio-economic disparities and tendencies can be attributed to the tenets of the grammar school legacy. In fact, even the attitudes of "intellectual arrogance" and "white collar" tendencies criticized in the policy of the ESR may be traced to the influence of academic rationalism which is intended to produce an "academic lord," and politically a "linking agent" (Bacchus, 1990) to the western colonial master. In other words, this class issue manifesting itself in schooling and curricula has a strong relationship to the colonial and colonizing education which, according to Mbilinyi (1975), colonizes pupils' minds:

> Tanzania inherited a formal education system which was designed to colonize its pupils and to fit them to the respective places in society: very few were selected for higher education, based on examinations which legitimized class formation in society ... The vast majority of schooled youth received minimum formal education in the schools, adequate to remain *passive* and become more productive peasant producers, but not enough or of a kind to provide for a subversive force of resistance. At all levels of education, high or low, education was designed to passify and colonize, to produce acceptance of the colonial and capitalist system. Schools, especially post-elementary schools, were organized in a military way. An authoritarian structure for school and classroom indoctrinated in the pupils their powerlessness and limited worth. Teacher education was a colonization process of special importance. Since the majority of school teachers at elementary level were Africans, it was imperative that they contribute to the maintenance of the colonial and capitalist system. We must note that, whereas the highly educated acted to do away with colonial relationship of a direct nature, they have been instrumental in preserving the neo-colonial capitalist process we experience today (p. 2).

This historical element has been addressed by Mazrui (1984) and Bacchus (1990). To ensure that their interests were safeguarded and their intents and strategies maintained, the colonizers - including neo-colonizers - created "middlemen" and even "middlecountries" as a linking agent to continue reproducing and transmitting the key ethos and characteristics of the colonial regime from one generation to the next. Bacchus (1990) finds that the approach was to attempt to "educate" or socialize a few of the local population to accept the values and beliefs of the colonizer, including the assumption of their superiority. These individuals were then used both as models for the locals who were aspiring to improve their conditions of life and to establish some links with the masses. The colonial education provided to the indigenous population, therefore, aimed at providing a *cultural bridge* between the expatriates and the African masses through creating a loyal group of local supporters. This linking group was provided with the same type of classical secondary education which was available to the middle class in the metropole. The colonizing powers aimed at developing and expanding "an intellectual infrastructure in their colonies which would help to ensure the emergence of a comprador

elite class that would continue to serve the interests of the colonizers after they had physically withdrawn from the local scene" (Bacchus, 1990, p. 295). All these strategies were made possible through the inculcation of academic rationalist curricula which taught the colonized how to cram and regurgitate rather than to think, create, and reflect critically on content and process. To date, the kind of education provided to students at all levels is basically still of this type, an antithesis of the goal of developing an inquiring mind.

Psacharopoulos' (1984) and Cooksey's (1980) observation on agricultural bias in relation to the children of peasant families can be related to the fact that class differentiation regarding vocational programs was historically spatial in terms of rural and urban differential. Vocational programs differed spatially and racially during the colonial times. In agricultural areas the bias was agricultural and technical, the latter being limited mainly to woodwork and masonry, whereas commercial, industrial, and engineering science courses were taught in urban areas. But this rural/urban dichotomy coincided with two racial divisions, the predominantly poor rural African indigenous population depending on agriculture, and the minority rich urban dwellers who consisted of mainly the European colonizers and Asians who engaged in commerce and industrial production. Except for a "superior" African school, almost all African schools were located in rural or rural-urban areas and engaged in those vocational activities that were despised as of low status and not undertaken in European and Asian schools.

What was common to the three sub-systems of colonial education was an academic rationalist curriculum of classic disciplines. It is thus most likely that this racial differentiation pertaining to vocational programs had a hidden curriculum which instilled into the African students the belief that agriculture and other technical courses they studied constituted of a "low status, inferior education" only for the poor, "unable," "dull," unintelligent, uncultured, children. It is no accident therefore, that those Africans who understood this hidden message of colonial education resisted these vocational programs. Consequently, African students had to struggle to do away with such degrading identity and ended up valuing only disciplined knowledge, which was seen as the major gate to higher status and being wealthy, and living in urban areas where they could lead better lives like Europeans and Asians. This attitude, however, led to despising agriculture by the majority of school graduates in a country where this economic activity was and still is the backbone of the lives of over 90 percent of its population. It also resulted into the long-standing problem of rural-urban migration by the youth in anticipation of leading a better life in towns, a problem that continues to be of high cost to the government by supporting unproductive, unemployed labor in urban areas.

A crucial point is that the curriculum organized on the basis of academic rationalism naturally embeds an urban rather than rural orientation because grammar schools were meant for an urban elite and autocratic class in England, and aimed at preparing an urbanite of intellectual excellence whose vocations did not involve "sweating" practical work or manual labor. In essence, therefore, this kind of education was totally irrelevant to the development needs of predominantly rural, agricultural countries like Tanzania. In fact, it is not conceptually appropriate, as Goodson (1983, p. 29) says, to assume that classical liberal education was non-vocational at all. It was indeed vocational to the extent that the academic rationalist vocations were only those fit for upper-middle class gentlemen. These "high status vocations" had acquired a separate dignity which was refused to the "low-status" vocations. The "low-status practical knowledge" was seen as consisting of "non-academic-intellectual vocations" which were viewed as unsuited for training of the mind and acquisition of intellectual excellence. However, such a view of education divorces theory from practice and is "non-praxis" in nature. This kind of education is still basically imported in Tanzanian secondary schools.

This is why vocational programs have been "academicized." This education is intended for the urban life, oriented more to urban employment and lifestyle than rural, agricultural life.

An adequate account of the problems of inequality in education in relation to the development of an inquiring mind will need to reflect critically on the customs and traditions of parenting and child rearing, which tend to encourage submissiveness, subservience, and fear to ask challenging questions and accepting tradition and custom as given and immutable; oppressive parental and marital customs and traditions which relegate women and children to the secondary position and discriminate against them, depriving them of their basic rights and freedoms; food habits and traditions that do not help nurture a healthy society and other such factors that directly and indirectly hamper the fostering of an inquiring mind in families, schools, and society as a whole. Society also has to protect its people and particularly its youth from problems such as drug abuse and consequent violence, which seemed to be on the increase in Tanzanian society, particularly in urban areas (Daily News, February 8, 1991; Daily News June 24, 1991).

THE ECONOMIC SITUATION AND PROVISION OF EDUCATIONAL RESOURCES

All the participants in this study believed that the economic environment in which teaching and learning took place was not particularly conducive to the smooth development of an inquiring mind in schools and teacher education institutions. They observed that, since the economy had been bad for a long time, it had "destabilized" everything including education. The bad economic situation had also acted as a disincentive to work because people were not interested in their work because their salaries could not support them. Consequently, most people, including educators and students, spent much of their time doing sideline economic activities in order to supplement their meager incomes and make their ends meet. "The cost of living seems to have forced everyone in this country to do away with the work ethics," an administrator participant commented.

Nguyuru Lipumba (George, 1988) found that:

> The intensity of the economic decay has demoralized large segments of the population. Public morality and social responsibility have declined. The political enthusiasm of the late 1960s and early 1970s has been replaced by widespread apathy and resignation (p. 98).

The bad economic situation affected the government's ability to provide educational institutions with basic teaching and learning materials. A survey of secondary schools carried out in 1981 found that:

> All institutions are in urgent need of maintenance and repair; buildings as well as the technical installations, furniture and equipment. Lack of funds, material and personnel has... up till now hampered the planned maintenance activities. The generally poor physical conditions of schools and lack of teacher housing, ... hamper quality improvement. Acute shortages of textbooks (one set per four students), materials and library stock affect the quality of both public and private schools" (Ministry of Education, 1981, p. 5).

At the time of field investigation this situation had improved, but not substantially. Participants still found secondary schools and teachers colleges to "lack necessary resources which could help inquiry happen." But, the physical environment of these institutions was improving substantially, partly due to a very supportive and empowering maintenance project started in 1986 and financed by the Danish International Development Agency (DANIDA). The project was imparting practical and theoretical knowledge of preventive maintenance techniques to the management of public secondary schools nationwide and to the MOEC school maintenance unit which was the implementing body of the program. Under this "Elimu-DANIDA School Maintenance Project," the project staff themselves were not doing rehabilitation of the buildings, but rather teaching the pupils to learn how to maintain the school buildings themselves. The project, therefore, helped pupils learn some skills by doing, and thus promoted the spirit of self-reliance.

It is true that the general lack of certain basic resources affected the quality of teaching and learning but, as indicated earlier, in some schools even available resources were not adequately used and in some situations misused and abused. The reasons for the existence of this situation included teachers' inadequate knowledge and experience in using certain teaching materials; poor proficiency in the use of English language which incapacitated teachers and pupils to understand clearly the content funded in the sources of information and thus got discouraged to use those resources or used them superficially; lack of relevance of content in certain imported textbooks as they were not originally meant for use in Tanzanian schools; textbook-based national and school examinations which limited teachers and pupils solely to the memorization of only that knowledge funded in prescribed textbooks; lack of certain resources which led to rendering the available ones useless; mindless administrative practices which resulted in locking up useful and authentic instructional materials in school stores; and, of course, the culture of basing teaching and learning on textbooks.

The Culture of Textbook-Based Teaching and Learning

Despite a real and apparent shortage of textbooks, and the fact that the available ones were inappropriate for the development of an inquiring mind, textbooks constituted a dominant teaching material in all the research secondary schools. In these schools, teaching and learning were absolutely *textbook-based* rather than *resource-based*. Making this point, an official participant, former curriculum developer with the ICD, observed:

> We are not promoting an inquiring mind for one basic reason: our teaching-learning situation is not resource-based but single textbook-based and teacher-based. This is the basic culture of schools since colonial times. With this teaching situation the pupils depend on the teacher and the teacher depends on that single textbook. So, both the teacher and learner are dependent on a single textbook. And this is what the ICD is encouraging; that is, writing a single textbook for a Form level. If our teaching-learning situation were resource-centered, then it would mean that the child would be sent to look for information from various sources. If this attitude is not promoted, the development of an inquiring mind is actually stifled. And this is what is actually happening in all of our schools.

This participant contributed a very significant observation. The culture of textbook-based teaching and learning has crippled the emergence of the ethos of an inquiring mind in all secondary schools and indeed other educational institutions, since

the colonial era, and thus contributing to the passivity inherent in the culture of silence. Textbook-based teaching and learning runs counter to the development and instructional use of libraries, current documents and primarily sources of information including resource persons, and other resources available in the immediate and extended community.

In some schools, libraries were closed. Where they were being used, their role was passive. Libraries were used as a place for pupils to revise their teacher-given notes or copy paragraphs from a lone textbook and gossip. Libraries, both school and public, were hardly used as a teaching and learning resource not mainly due to the "unattractive stock and lack of trained staff" as the World Bank reports (World Bank, 1990, p. 8), but primarily because of the effect of the textbook-based culture of teaching and learning which precluded the possibility of cultivating an inquiring ethos in the schools, teachers colleges, and other educational institutions.

The culture of textbook-based teaching and learning in Tanzania was discipline-centered and thus helped to entrench and perpetuate academic rationalism. A senior administrator participant from the MOEC headquarters actually believed that teaching of social studies and integrated science was suited to situations where the instructional environment was "rich" in resources, while the teaching of disciplines of knowledge was appropriate in a resource-deficient environment because curriculum developers could prepare a single textbook for a particular discipline at a particular Form (Grade) level. "Given the Tanzanian situation," he said, "this [social studies/integrated science] approach is not suitable because we have a shortage of teaching materials, personnel and all that. I think it is good for a society where you have materials." The assumption is that basing teaching and learning on discipline-oriented, textbook-based climate helps solve problems of shortage of instructional resources. This assumption is tantamount to believing that the culture of resource-based teaching and learning was in fact redundant and undesirable.

Belief in the use of a textbook was indeed a deep-seated teachers' frame of reference. All teachers were requested to respond to the question: *What are your views about the use of a textbook?* Virtually all teachers said that a textbook was the most basic and necessary instructional material. To some teachers a textbook was tantamount to schooling itself. "For good schooling in all societies, teachers and pupils must have adequate textbooks," a teacher insisted. But, as another participant suggested, "textbook-based instruction also implies that it must be teacher-centered." Not only that, in fact, this practice puts "specialist funders of knowledge" of all kinds at the center-stage of teaching and learning, leaving both teachers and pupils mere faithful consumers of someone else's products. Even if pupils are supplied with enough textbooks, this culture will hardly allow the ethos of developing an inquiring mind to take root in Tanzanian secondary schools.

Educational Human Resource

Evidence from some participants and documents indicate that there was a shortage of teachers in secondary schools, and teacher educators in teacher education institutions, which affected the quantity and quality of teachers being prepared in these institutions.

One major factor that caused quantitative and qualitative shortage of teachers in secondary schools in Tanzania was rapid expansion of the secondary school sector. As tables 7 and 8 indicate, the number of both public and private secondary schools was increasing faster than the rate of availability of secondary school teachers.

Table 7: Number of Public and Private Secondary Schools: 1984 - 1992.

Year	1984	1985	1986	1987	1988	1989	1990	1991	1992
Total No. of Schools	170	190	219	245	288	319	348	385	413
Public	85	86	95	103	113	124	135	158	165
Private	85	104	124	142	175	195	213	227	248

Source: Ministry of Education (1989, p.17; 1990b, p.18). MOEC (1991b, p.17; 1992, p. 6).

Table 8: Number of Teaching Staff in Public and Private Secondary Schools: 1984-1990

Year	1984	1985	1986	1987	1988	1989	1990
Total No. of Public Teaching Staff	2478	2726	2936	3185	3674	3866	3661
Percentage Increase	5.7	11.8	9.0	8.5	15.4	5.2	-5.3
Total No. of Private Teaching Staff	1497	1603	1897	2472	2922	2982	2928
Percentage Increase	10.1	7.1	18.3	30.3	18.2	2.1	-1.8

Source: Ministry of Education (1989, p.15; 1990b, p.16). MOEC, 1991b, p. 17).

Table 9: Average Number of Teachers Per School and Per Stream in Public Secondary Schools: 1984 - 1990

Year	1984	1985	1986	1987	1988	1989	1990
No. of Schools	85	86	95	103	113	124	135
No. of Teaching Staff	2478	2726	2936	3185	2674	2866	3661
Average No. of Teachers per School	29	31	31	31	32	31	27
No. of Streams	1240	1255	1278	1343	1489	1613	1690
Average No. of Teachers per Stream	2	2	2	2	2	2	2

Table 10: Average Number of Teachers Per School and Per Stream in Private Secondary Schools: 1984 - 1990.

Year	1984	1985	1986	1987	1988	1989	1990
No. of Schools	85	104	124	142	175	195	213
No. of Teaching Staff	1497	1603	1897	2472	2922	2982	2928
No. of Teaching Staff per School	17	15	15	17	17	15	14
No. of Streams	856	1045	1148	1435	1735	1913	2103
Average No. of Teachers per Stream	2	1	2	2	2	1	1

Not only was there a decline in the percentage increase of teachers, reaching - 5.3 and - 1.8 for public and private secondary schools respectively (Table 8), but the average number of teachers per school was both small and decreasing as well, reaching 27 and 14 in public and private schools respectively (Tables 9 and 10). This latter figure was alarmingly smaller in private secondary schools where the average number of teachers per stream had also plummeted to one teacher while in public secondary schools it had been a constant of two teachers over the seven year period. In fact, these figures could be lower as by 1992, secondary schools had mushroomed to the tune of 413, public ones being 165 and private ones 248 (Table 7).

This situation was coupled with other factors. These included the unwillingness by high school graduates who passed highly to join the teaching profession due to its "low" status; and the competition from other more prestigious professions, which led to selecting mostly Division Four holders to take teaching; past government policy of keeping down the number of secondary school graduates and limiting university entrance, resulting into a shortage of graduate teachers (Cooksey, 1986; Mukyanuzi, 1990; Mosha, 1990); and, limited resources.

All these reasons led to the fact that Tanzanian secondary schools were primarily staffed by non-graduate teachers, particularly diploma teachers. This fact can be observed clearly from Tables 11 and 12. Table 11 shows that only about 26 percent of secondary school teachers were graduates, and 74 percent non-graduates, including diploma teachers who accounted for about 70 percent of the total teaching force in Tanzania secondary schools. Yet, evidence pointed to the fact that diploma teachers were very poorly prepared through crash programs, and that a good number of them lacked a background to teach in secondary schools. The proportion of secondary school graduate teachers has been falling from a high of 40 percent in 1980 (Cooksey, 1986, p. 184).

Table 11: Qualifications of the Teaching Staff in Tanzania Public Secondary Schools.

Qualifications	Number of Teachers	Percentage
Ph.D..	1	0.02
MA./M.Ed..	33	0.90
MSc./M.Ed.. Sc.	26	0.73
BA/BEd Arts	456	12.91
B.Sc./BEd. Sc.	389	11.08
Dip. Arts/Sc.	2463	69.80
Certificate	58	1.64
Form VI	28	0.79
Grade "A"	69	1.95
Grade "B"	6	0.16
Grade "C"	1	0.02
Total	3530	100.00

Source: TSS4 Form, Department of Secondary Education, Ministry of Education and Culture, March, 1990. (Data was compiled from returns from 130 public secondary schools).

The poor preparation of teachers must have been one major reason for the declining performance of secondary school pupils. The bitter fact is that secondary schools in Tanzania have been staffed mainly by an incompetent, mediocre teacher who can hardly develop an inquiring mind. The causes for this can partly be attributed to the performance of teacher education institutions, but primarily to the interests and style of governance of the polity. Leaving professional matters to the incompetent layman simply because he or she has the power to order and dictate teachers must have incapacitated efforts and thwarted the enthusiasm to prepare capable teachers at all levels of teacher education.

Other factors related to this issue have contributed to quantitative and qualitative shortages of secondary school teachers. One of them is the brain drain, particularly in inter-occupational skill exfoliation. In the Ministry of Education and Culture, the mobility trend in 1989 was about 900 teachers (Mukyanuzi, 1990, p. 11). Brain drain to other countries was alarmingly high with regard to University staff where, on the average, there was an annual exodus of 10 lecturers (Mukyanuzi, 1990, p. 12). Appointing teachers to leadership posts within and outside the MOEC has also been siphoning out the best teachers. One participant noted that this practice has a long history as it intensified in the early 1960s with the Africanization drive, and in the early 1970s with the policy of regional decentralization. The economy must have contributed to poor preparation of teachers, as they were also prepared within a difficult context in which teacher educators were also in a hurry in order to secure time to do sidelines for survival.

Table 12: Number of Teachers According to Their Qualifications and Teaching Subjects

	P.HD..	MA, M.ED. Arts	MSc, M.ED. Sc.	BA, BED Arts	B.Sc., BED Sc.	DIP Arts and Sc.	CERT.	FORM VI	GD. A	GD. B	GD. C	TOTAL
Kiswahili				40		166	13	2	21	2		244
English		8		104	1	237	3	5	5			363
French	1			15	1	28		1				46
Political Ed.		9		107	6	123	11		12			268
History		6		85		153	2	1	1			248
Geography		3		63	16	196		3	5			286
Economics				19		8						27
Maths		5	8	2	94	289		5	6			409
Additional Math				1	11	18		1				31
Biology		2	5		90	210	2	1	1			311
Physics			6	1	75	221		6				309
Chemistry			4		81	245		1	1			332
Commerce				10	1	81		1				93
Accounts				5	1	50		1				57
Typing						11	4					11
Fine Art				2	1	15			1			23
Physical Ed.									2			2
Music				1		20	7		3	1	1	33
Home Econ.					1	66	4		9	3		83
Civil Tech Ed.					1	65						66
Mechanical Tech Ed.			2	1	3	49	1					56
Electrical Tech Ed.						43	1					44
Agriculture			1		6	154	7					168
Woodwork						15	3		2			20
TOTAL	1	33	26	456	389	2463	58	28	69	6	1	3530

Another observation from Table 12 is that there was a tendency for non-graduate teachers to teach so called "low status" subjects such as fine arts, music, and vocational subjects. The government policy was that only graduate and diploma teachers were supposed to teach in secondary schools. However, as it can be seen from Tables 11 and 12, teachers with lower qualifications including a Grade "C" teacher (a grade that has been phased out) were still teaching in secondary schools due to shortage of graduate teachers.

Impact of International Trade

The hard economic situation in Tanzania was the result of both local and international factors. At the international level, the language was one of protectionism, falling commodity prices, rising prices for imported goods, inflation, high interest rates, the debt crisis, including the "debt trap," unemployment, and rising cost of living and falling standards of living. All of these had a tremendous impact on the ability of the government and parents to provide for education.

Tanzania, like any other developing nation, was an "unequal" participant in the world trade. Protectionism and persistent decline in the world prices of Tanzania's export commodities have had a great negative impact on the economy of the country. Not only did Tanzania's export earnings take a nose-dive, but the quantities of export crops that it could market also declined. By 1984, export earnings were 30 percent below the 1980-81 average; in 1985 fully 40 percent below what they had been five years earlier. In 1986 the price on the world market for cotton, one of the major export crops, dropped from 68 cents a pound to 34 cents a pound (George, 1988, p. 99). President of Tanzania, Ali Hassan Mwinyi (1990, p. 8), reported that in 1990 the price of Tanzanian coffee in international markets was £600 per ton, but three years earlier the price was £3,000 a ton. The price of cloves was $9,000 a ton in 1982 but in 1990 it was only $1,700 per ton.

While the prices for the export commodities were declining so drastically, the prices for the imported goods increased at an alarming rate of 900 percent or more. For example, President Mwinyi (1987, p. 9) reported that in 1982 the price of one Leyland bus with 65 seats was 902, 750 Tanzanian shillings and the bus fare was 17 cents per kilometer. In 1987, the price for the same kind of bus was 7,823,208 Tanzanian shillings and the bus fare had risen to 1.38 Tanzanian shillings per kilometer.

This trend led to Tanzania being unable to import required basic producer goods such as machinery, spare parts, and raw materials for the young industries, or agricultural inputs, such as fertilizer and insecticides. Industrial production plummeted, and most of the factories were operating far below installed capacities. In 1988 the industrial growth rate for Tanzania was reported to be a mere 5.4 percent, but its investment had leaped from 2.7 percent in 1986/87 period to 20.2 percent in the 1987/88 period (Daily News, June 19, 1991 p. 4). The results of these economic changes was to produce less and less consumer and producer goods, increased unemployment, falling standards of living, and less ability to provide for educational institutions.

Impact of Foreign Aid

Like other developing countries, Tanzania's leadership has heavily depended on foreign aid for its development programs; but, this dependency of course, was not without serious problems and misunderstandings. It is obvious that some of the conditions imposed by the IMF and the World Bank as a cure to Tanzania's economic ills have been a bitter pill for the majority of Tanzanians. They included devaluation of local currency, raising of interest rates on loans from local banks, liberalization, and privatization of the economy. These conditions tended to aggravate the already bad economic situation.

President Mwinyi (1990, p. 9), for example, reported that one major condition of the IMF was that Tanzania had to devalue its currency massively. This step led to an unprecedented inflationary economy in the country. For instance, in 1986, one US dollar was equivalent to 17 Tanzanian shillings; in 1990 the same dollar was equivalent to 200

Tanzanian shillings. By 1993 one US dollar was worth over 470 Tanzanian shillings. This devaluation reduced further Tanzania's purchasing power of imported goods, raised the prices of all goods and services in the country and reduced greatly the people's purchasing power to meet the cost of essential needs, and contributed to snowballing of low industrial and agricultural production, unemployment, and inability to provide for schools, other educational institutions, and educators. President Mwinyi (1990) articulated this problem as follows:

> Also, devaluation endangers the real incomes of our people. It sharply reduces the purchasing power ... their monthly earnings have been so much eroded that they cannot meet their basic needs for thirty days. So they spend their salary in six days, seven days, ten days. Then they have got to do something to make sure they survive until the end of the month when they get another (p. 9).

The economy has for the past 22 years experienced high inflation rates. For the period between 1980-1988 the inflation rate had been over 30 percent (Daily News, March 19, 1991, p. 4). As a result, virtually all employed people in the country had to find other means of earning additional income.

In 1991, the government made it legal for workers to hold two or more jobs and endorsed efforts to have other means of earning income provided that this did not affect one's official job. The extent to which this policy will affect teaching and learning remains to be seen. Other conditions, particularly the raising of interest rates on money borrowed from local banks by 30 percent, also tended to exacerbate inflation and other economic difficulties. The benefits and hardships caused by these conditions are yet to be assessed, but it is most unlikely that teaching and learning in schools would improve towards development of an inquiring mind as a result of these prescriptions.

Local Factors

The hard economic situation emanating from international forces was complicated by local factors such as shortage of well-trained workers and inexperience in managing the modern economic sector; poor planning and inappropriate economic policies; rigid centralization and the top-down model of leadership and decision-making; and placing politics more "in command" than economic principles in order to achieve "Party Supremacy" with consequent marginalization of the majority of scholars and labor imbalances (Mukyanuzi, 1990).

Funding of Education

All participants, including pupils, found that one reason for the low quality of education in Tanzania was the government's minimal allocation of fund to the education sector. "Education is poorly financed," "we are not provided enough money to support the education system," "decision-makers in financial matters and politicians do not take seriously education as a national priority," and "the government is not providing enough funds for the education sector to function as effectively as it is supposed to" are among the participants' responses which expressed this problem.

Table 13: Central Government Budget Allocation to the Ministry of Education (Recurrent) in Million Shs. 1980/81 - 1990/91

Year	Total Budget	Ministry of Education Allocation	Percent
1980/81	14895.0	1737.7	11.7
1981/82	18316.1	2258.6	12.3
1982/83	18993.0	2524.0	13.3
1983/84	21460.9	2502.6	11.7
1984/85	27438.4	1795.1	6.5
1985/86	39764.4	2321.2	5.8
1986/87	53300.6	4227.1	7.9
1987/88	77667.9	4268.2	5.4
1988/89	118672.0	5659.3	4.8
1989/90	144248.7	8322.0	5.8
1990/91	160000.0	10153.7	6.3

Source: Ministry of Education and Culture, (June 1991, p. 39).

As Table 13 shows, the government's financial commitment to education has been minimal over the years. By 1988/89 fiscal year, only 4.8 percent of the government's recurrent budget was allocated to the Ministry of Education. There has been some slight increase of this percentage beginning 1989/90 budget, but it had not made any difference in terms of the quality of teaching and learning in schools.

The government's low expenditure on education was rationalized by some MOEC officials as due to the bad economic situation in the country. However, some participants felt that, although this was true, the effects of this problem could have been minimized had education been a priority in the minds and eyes of the polity and policy makers in the allocation of the meager resources to competing needs. An official participant found that the problem was lack of priorities in the use of funds and that, as a result, "shortage of funds is sometimes not real but an assumed problem." Another participant found that "for political interests, politicians prefer to spend huge amounts of funds on constructing 'white elephants' rather than on educational service. They go for things that put them in the political limelight, and are not interested in abstract and invisible things like an inquiring mind." These participants believed that much could have been done to improve the quality of education within the existing financial constraints had education been a genuine priority for political and government leadership.

Tanzania has relied heavily on foreign aid to finance education. Major donors have been the World Bank, the Swedish International Development Agency (SIDA), and the Danish International Development Agency (DANIDA). The World Bank has been the major lender, particularly in the capital development of secondary education (Cooksey, 1986; World Bank, 1990). Over a six-year period 1981/82-1986/87, an amount of 2,230 million Tanzanian shillings came from external sources. For the fiscal year 1987/88, a further amount of 456 million Tanzanian shillings was received by MOEC as assistance accounting for 49.3 percent of the capital budget (World Bank, 1990, p. 83). Despite this donor aid, the government's financial commitment to education has remained minimal.

The World Bank (1990) agrees that: "Much of the decline in the education share of the Tanzanian budget has resulted from the heavy and increasing demand on the Reserve Fund to serve the country's rising external debt" (p. 13). Regarding this issue, the Bank also observes that 'education has also lost some ground relative to the other economic sectors. In 1983, the education share of the budget net of debt servicing was 17

percent, about the same as it had been in 1968. In 1984 and in all years since then, it has been in the range of 14 percent. Indeed, the debt crisis had greatly affected Tanzania's ability to provide quality education in general and to stifle the possibility of thinking about the development of an inquiring mind in particular.

Another source of funds for financing education is fees paid by students. Following the recommendations of the Presidential Commission on Education (1984b), the government reintroduced fees in public secondary schools in 1985 and rates have been varying year after year. In fact the major source of income for financing secondary education is student fees, which were introduced to offset the increasing cost of education.

Two major concerns were raised by some participants concerning fees. One was that funds so raised might not contribute greatly to educational improvement if they were not going to be channeled directly to the Ministry of Education, but get paid to the central government revenue. They suggested that all such funds needed to be allocated for qualitative improvement in education, including the development of an inquiring mind. Another concern was that the reintroduction of fees would lead to inequality in educational opportunities, as only the majority of sons and daughters of the rich were likely to have access to education or to a "better" one and consequently to better "life chances." They believed that rampant corruption and self-interest on the part of some authorities would tend to preclude a fair selection process to secondary and higher education and encourage misuse of fees exemption arrangements for the children of poor parents. Up to 1992, however, fees in public secondary schools were much lower and affordable than those charged by private secondary schools. Efforts to increase income generating activities in schools through self-reliance activities have contributed little to the recovery of costs, with income estimated to be more than 4 percent of costs even in schools where such programs were considered successful (World Bank, 1990, p. 13).

A major strategy to reduce the cost of education was the government's decision to establish only day secondary schools in the future and phase out boarding schools, because the latter were expensive to run. The provision of newly opened day secondary schools would be shared by the central MOEC and the local *community*, in that government would provide building materials and standard designs and the local community would provide the labor. During the fiscal year 1989/90, 28 such secondary schools were commissioned under that expansionist policy of secondary school enrollments. One major concern voiced by some participants regarding these "community" secondary schools was that their infrastructure was very poor compared to those secondary schools which were solely managed by the government; they also lacked teaching equipment, laboratories, libraries and books, office space, and teachers, both in quality and number. Most of those schools have been built on political populist reasons. The community spirit to provide more opportunity for standard seven leavers to secondary education is good. However, this trend at the same time was likely to result in the existence of a *dualistic* structure of the educational system whereby secondary schools wholly managed by MOEC provided better education than the "community" ones. As a result, this dual system was likely to contribute further to inequality in educational provision. It was indeed reported by an official participant that some children of rich parents and high ranking officials were refusing to go to the community-based secondary schools, and instead opted to go to very expensive private secondary schools or lobbied to be enrolled into Weruweru type public secondary schools.

The Curriculum Paradigm

Samoff (1992) observes that "increasingly, the World Bank has come to be the leading agency in setting the education and development agenda" (p. 63) in many African countries, and he analyzes the factors that have contributed to the World Bank's interest in and ability to assume this role. The Bank's lead in this respect is accompanied by its philosophical and psychological advocacy in curriculum matters. In Tanzania's context the Bank's thinking in curriculum development and implementation can be identified in its report (1990).

The World Bank's central view of curriculum development was that of "curriculum as instrumental action" a top-down installing process that embraces the "business metaphor" and sees teaching and learning as "management" of education. This view is rooted in paradigms pivoted on empiricism, positivism, and rationalism. The current Bank's project for Tanzania enhances the existing highly centralized top-down curriculum development practices and structure, rather than empower classroom practitioners and enable them to assume a central role in the curriculum development and implementation process. There was enthusiasm and excitement among some participants that the proposed ten Teacher Resource Centers (TRCs) would empower teachers and tutors in this regard, but an analysis of the World Bank's report reveals that those TRCs are intended to act as mere technical and instrumental orientation centers for installation of ready-made, merely copied and duplicated commercial programs and materials, but not essentially for promoting teachers' and students' ability to inquire and innovate. Both teachers and ICD curriculum developers are seen as mere consumers of imported specialist products. Then the Bank intends to net some profit from the sale of those products, using the teachers and pupils not only as guinea pigs to pilot test the quality of those products, but also as final consumers. In my view this approach is unethical and unacceptable. Yet it is precisely what the World Bank planned to do to Tanzanian secondary schools.

The process is like this: according to the Bank's report (1990), trial kits of the programs to be installed would be imported into the country at different stages for the ten TRCs. Sensitization seminars for the TRC team would be conducted. These seminars would be followed by orientation seminars at TRCs for teachers involved in the trials. Then trial material would be introduced in schools while the ordering and production of re-supply kits and more seminars for other teachers were being done. The installed programs would then be evaluated or field tested and revised, printed, and integrated into the Tanzanian examination system.

A section of the World Bank's report on the development of secondary school textbooks states that the Eighth IDA project would increase the availability of textbooks for secondary schools to the ratio of one book of each basic title for every two students, by supporting the secondary textbook production program which would be implemented in two phases. During phase one, the ICD would review the current O-level series and select from a sample of titles available from African countries the appropriate series, and obtain the reprinting and adaptation rights for these books. The reprint editions would be pilot tested in a small sample of twelve to fifteen secondary schools selected as field-testing sites. Feedback subsequently gathered would be the basis for the development under phase two of a new secondary series. Then the revised secondary textbooks would be published following International Competitive Bidding (ICB) procedures following IDA guidelines, for editorial and other services including printing. Distribution services

would be awarded following Local Competitive Bidding (LCB) procedures following IDA guidelines (World Bank, 1990, p. 37).

Besides strengthening the top-down installation process, the World Bank's program reinforces the time-honored culture of textbook-based rather than resource-based teaching and learning. Curriculum development is largely seen as helping the ICD to produce and/or reproduce an authoritative textbook or kit for a teacher and pupil to use as given truths. Then project implementors are socialized into the ethos enshrined in the language of "pilots" and "take-off" like jet liners, "trickle-down," and "multiplier effect," and other linear input/output technocratic views which imply that development in education is really only measured by end-product rather than the process of inquiry as well.

According to this report, "teachers would be trained in the *use* of newly developed materials" (p. 32). Although the Bank's aim is to "improve the *quality* of instruction at primary and secondary levels," teachers are seen as *instruments* of the implementation of the Bank's program. Indeed, it is stated in the report that "the proposed project would assist the government address the issues and goals [of education] and would support the government aim of improving the quality of education from the *bottom-up*." Yet the whole project is based on the traditional *top-down* model of decision-making and curriculum paradigms and practices that are totally antithetical to the development of an inquiring mind. Throughout the World Bank's (1990) report, this crucial inquiry goal is not mentioned anywhere, but rather remains "invisible" and "intransparent" in the eyes of the well-trained Bank's international educational experts vested in current thinking and trends in curriculum and instruction. I was encouraged, however, that both participants from the ICD said they resented strongly this approach to curriculum development which reduced them to mere passive receivers and users of expert knowledge and rubber-stamping of imported curricula. "We have to write our own books with Tanzanian orientation, be them poorly written or cheaply bound. Without this opportunity to gain experience and learn from our mistakes we cannot learn and produce better books," a curriculum developer participant reacted

The Research Paradigm

The dominant research paradigm utilized and advocated by donor agencies is another factor that may have influenced the possibility to develop an inquiring mind in Tanzania. The World Bank's research and development philosophy, for example, influenced the thinking and practice of Tanzania's policy makers and intellectuals long before the promulgation of ESR policy in 1967 (Cooksey, 1986). As Samoff (1992) observes, developmental programs of the African countries seeking financial support are forced to be responsive to the agenda and preferences of the funding agencies. The funding agency makes the provision of support conditional on the adoption of specific policies, priorities, or programs that are based on a particular research and intellectual paradigm. Making this intellectual ethos conditional to the provision of fund aid, the donor agency uses it as a means of controlling and influencing the *thinking* of intellectuals and policy makers in the recipient country and the nature and direction of its development programs and lifestyles of its populace. Indeed, it is a process of "colonizing" the minds of the people receiving the financial aid by using those local intellectuals who get socialized into this ethos.

Samoff (1992) analyses the nature of the conjunction of financial development assistance to African countries and research commissioned by donor agencies, a phenomenon he terms *"financial-intellectual complex of foreign aid."* Samoff finds that

the *"research that is deemed relevant by the donor agencies, particularly the World Bank, is generally instrumental and relatively narrowly gauged since it takes the existing patterns of economic, political and social organizations as given"* (p. 61). One assumption embedded in the intellectual-financial complex of foreign aid is that "project managers want to know *what works*. Samoff (1992) observes that "'what works' must be specified in explicit and quantitative terms" (p. 65). Reacting to the same issue, Eisner (1992) observes that "our narrow conception of rationality is expressed in our incessant search for "what works;" it supports the belief that there is, in fact, a single best way, that the main task of researchers is to find it, and that the primary obligation of teachers is to use it" (p. 594).

The need to know *what works* both nurtures and is compounded by the tendency to *generalize*. To address fully the particularities and uniqueness of each setting would make it impossible to develop rule-like, generic principles and priorities to guide funding decisions. Samoff (1992, p. 66) observes that usually these generalizations are made on the basis of sorely limited evidence. He finds that "the research that fulfills this role is limited in perspective and approach with little evaluation to critical review by people with relevant expertise" (p. 74).

Samoff (1992) finds that the dominant research ethos of the financial-intellectual complex of foreign aid, particularly that advocated by the World Bank, is rooted in "scientism and super-rationality" (p. 66). Samoff writes:

> The prevailing rationalist and utilitarian ethos requires an affirmation in the form of 'it [this investment] is [cost] effective,' or 'it will work,' or 'this strategy works best' ... most often the affirmation of effectiveness must rest on appropriate research findings. Only some research can play that role. The specification of the sorts of research that can credibly support (or reject) the affirmation of effectiveness is another dimension of the financial-intellectual complex. The greater the role in the approval process played by individuals who consider themselves *hard scientists* (a self-description that in the social sciences is common among, but not limited to, economists), the greater the pressure for explicit and unambiguous research findings expressed in quantitative terms (p. 66).

Samoff also notes that the financial-intellectual complex not only consumes and commissions research, but it also specifies the type of research that it will regard as legitimate and capable of generating valid results. He finds that *"it is the behavioral science mainstream that is preferred, especially studies that seek to test hypothesized relationships through the analysis of quantitative data, an orientation that has a broad reach"* (p. 72). In other words, the dominant research ethos of the World Bank and other donor agencies is rooted in the empiricist-positivist-rationalist philosophical and psychological tradition which favors the utilization of process-product and competence-based educational research. Indeed, the current World Bank's research agenda under the Eighth IDA package for Tanzania is typically of this category (World Bank, 1990).

The major concern here is not that research has no role in decision-making or that policy makers should ignore research in favor of non-scientific decision making processes. Rather, the issue is the consequences of a largely uncritical reliance on claimed findings generated by a particular sort of research in a setting where the arbiters of research quality are also the providers of funds. Samoff (1992, p. 67) finds that the manifestations, consequences and problems of this conjunction of funding and research are multiple: influencing and constraining the education and development discourse; legitimizing weak propositions; entrenching flawed understandings by according them

official status; seeding and fertilizing theoretical and analytic fads; and treating education primarily as technique and administration.

Furthermore, the local populace lacks participation in the decision-making process. In the process of utilizing positivist research as the visa required to cross funding's frontier, the prevailing understanding, indeed faith, that education is a complex undertaking whose organization and management are best left to the relevant specialists limits popular participation in discussions of education policy. Consequently, as Hawes and Stephens (1990, p. 33) note, quite often worthy projects heavily funded by large aid organization have failed to have any impact because, at each stage of the development of the project, scant regard has been paid to the involvement of local people in the decision-making and implementation process.

This problem was already apparent in Tanzania in relation to the English Language Support Project, which came as a *pilot project* in the secondary schools. There was a complaint that there were "cultural contradictions" in the reading materials which were directly imported by the British Council into the Tanzanian situation without regard to the local cultural realities. For this reason, those materials were being rejected by some teachers and pupils, thus rendering the effort a waste of resources. Another concern was that, since the program was not school-based and thus lacked genuine support from educators and depended mainly on donor funding, there was a high probability of the program collapsing and terminating when such support was withdrawn after the agreement expired.

Regarding the "pervasive treatment of *education as technique and administration,*" Samoff observes that the common terminology of policy-oriented research by donor agencies is more likely to talk about delivery systems than teaching and learning, about inefficiency than the realization of human potential, and about returns on investment than nurturing curiosity or encouraging innovation or the creative expression of ideas and insight (Samoff, 1992, p. 72). This intellectual ethos seeks to maximize efficiency and certainty. As Hawes and Stephens (1990, p.180) observe, management of change in these circumstances is concerned with two fundamentals: realignment of priorities within the development programs and more effective control over the management of those programs. To achieve this control in educational context, curriculum development and implementation process must, as well, work to achieve a perfect fit with this research ethos. Curriculum process and consequently instruction have to be rooted in the top-down, instrumental technocratic paradigm.

As Samoff (1992) notes, however, the

> insistence on certainty in an uncertain world is neither liberating nor rejuvenating. The cascades of certainty that constitute research on education and development neither wash away ignorance and confusion nor irrigate the seed beds of local imagination and initiative. Instead, as it becomes a set of largely externally defined rules specifying acceptable courses of action, research disorients and imprisons. Even worse, the prisoners themselves become the warden and jailers" (p. 73).

Samoff (1992) asks: "How, though, will Africans overcome their dependence on external intellectual leadership and standards if learning and creativity are not the central focus of education and development initiatives?" (p. 72). Those educators and others dedicated to the course of designing and providing an education that aims at fostering an

inquiring mind and thereby humanizing, liberating, and empowering learners and educators will have to address such questions seriously.

THE CULTURE OF SILENCE

Like colonial education, one major problem of dependence on foreign aid is its propensity to engender *passivity* in its recipients. Paulo Freire (1985), more eloquently, talks of the poor's *"culture of silence"* - a silence lacking any critical response to events enacted in their name. The research and intellectual ethos of the international aid agencies embraces this notion of the culture of silence. But, if this passivity is made to continue, it will *never* give a chance to the recipients of such aid to develop an inquiring mind and become self-reliant. This passivity is one of the most dangerous "poisonous weeds" the colonizer succeeded to plant and fertilize in African societies.

The "indigenous" education which prevailed in the pre-colonial days was, as Bacchus (1990, p. 290) observes, largely non-formal and geared primarily at preparing the young to grapple with the realities of life which they would likely face in their futures and thus learned by doing. In Hawes and Stephens' (1990) terminology it was education focusing on "needs now" and "needs later" rather than merely the latter as is the case with current academic rationalist formal education. Despite its shortcomings, indigenous education was to a large extent inquiry-oriented and relevant to its recipients. The youth participated in the solution of societal and individual problems through active thinking in a "praxis-situation" whereby theory evolved from practice and practice evolved from theory in social action. It was an education that enabled African people to create and invent, innovate and produce knowledge and artifacts rather than merely consume the products of others. This trend, however, began to be reversed with the advent of colonialism and its dehumanizing and depersonalizing agenda.

The fate of Africa's genuine development and creativity was sealed with the coming of colonialism. The colonial administration introduced the Africans to the *products* but not the *process* of their technology. The encounter made the African the consumer of the products of science and technology, leaving the colonizer (including the neo-colonizer) to go ahead with innovation and production of finished products, and the colonized, the producer of raw materials. It was an encounter based on the true meaning of the *business metaphor*. And, in this respect, the development of an inquiring mind becomes a really hot political issue. For, this colonial relationship extended to the educational plane, inhibiting progress in the fostering of an inquiring mind in all fields of knowledge. It was a deliberate policy of the colonizer to stifle and stunt the inquiring abilities of the colonized so that they would not become equals. As a result, the colonial regime was committed to a restrictive, but nonetheless effective, policy of providing an academic education designed to produce efficient junior civil servants and a mass of laborers. This education taught them to write, spell, add, and multiply correctly; but, it did not dispose them to ask too many questions. And, when questions were asked, they had to be uncritical and supportive of the interests and authority of the colonizer - hence the culture of silence. As Bacchus (1990) puts it, "the colonized were in essence taught to be subservient and loyal to their imperial masters and to accept willingly their own positions at the lowest levels of their social and economic hierarchy of their societies" (p. 291).

As if this dehumanizing process were not enough, the colonial encounter came with it a *colonial indoctrination* which was intended to "colonize" the minds of the colonized "subjects" to the extent of negating their own historical and cultural achievements and indeed their own existence. The Africans with such *"colonial mentality"* were made to view indigenous African science and technology as

"uncivilized," "primitive," "backward," "metaphysical," and "unscientific." By controlling the mentality of the colonized, the colonizer waged a philosophical, psychological, and cultural assault on the process of indigenous science and technology and its products and rendered it impotent and worthless. Today this colonial legacy manifests itself in the politics of independence of dependency rooted in the business metaphor.

The passivity and dependence that was planted in African societies by colonial regimes is enshrined in and perpetuated by the financial-intellectual complex of foreign aid. Inculcation of the culture of silence, which is absolutely antithetical to the development of an inquiring mind, is a deliberate agenda of some donor agencies, a phenomenon of neo-colonialism. Of course, some agencies are genuinely ready to help; yet, as Hawes and Stephens (1990) observe "they are equally anxious not to disturb a world economic order that centralizes economic decision-making in western capital cities" (p. 33) or which ensures smooth capital flow from poor to rich countries.

This latter observation has been documented. Hawes and Stephens (1990) find that the debt crisis in developing countries "means that when we take into account investment, official and private lending, and subtract repayments of interest and capital, the net flow of resources is now from the developing world to the industrialized world" (p. 185). Marie-Luise Hauch-Fleck (Family Mirror, June, 1992), commenting on the UNDP's "Human Development Report, wrote that "the capital flow from the North to the South changed from plus $ 43 billion to minus $ 33 billion. In other words the poor countries were financing the rich" (p. 14).

The culture of silence embedded in the financial-intellectual ethos of foreign aid has partly helped the rich countries of the North achieve this goal. It is wishful thinking, therefore, to believe that a poor country can become rich and empower its people by *relying* on foreign aid. As evidence shows, aid has failed and will never succeed to alleviate poverty in Africa or any other part of the developing world. True, as Lwaitama and Rubagumya (1989) observe, African countries are actually unlikely to develop if they continue to rely to a very large extent on assistance from colonial powers. This dependency which nurtures and perpetuates the culture of silence will continue to stifle the development of indigenous scientific and technological capabilities, and in turn accentuate economic dependency and passivity. Current international economic and political trends show that even empowering foreign aid will in the future not be as forthcoming as it used to be for African countries, including Tanzania. These trends would seem to demand the adoption of self-reliance policies. This situation demands that the culture of silence that inhibits us from developing indigenous scientific and technological capabilities and a firm foundation upon which fostering of an inquiring mind can take place will have to be challenged and dismantled.

SUMMARY

In this chapter some of the social, economic, political, and cultural factors that may have influenced the fostering of an inquiring mind were explored. The themes looked at included the problem of the medium of teaching and learning; the governance, including school administration and teacher motivation; the problem of equity; the economic situation and provision of educational resources; the intellectual ethos of foreign aid; and the culture of silence. A complex web of factors operating at local and international levels, some of which are historical and have been reproducing themselves, have made it difficult for Tanzania to reach the goal of developing an inquiring mind in secondary schools and other educational institutions. It will be shown in the next chapter

that despite this complex, unsupportive situation, it is possible, with some imagination, to look for a "room for maneuver" and work towards achieving this goal.

CHAPTER TEN

CONCLUSION: POSSIBILITIES FOR CHANGE

INTRODUCTION

Freire (1985) suggested two basic, interrelated stages in the process of change: the stage of the "language of critique" and the stage of the "language of possibility." A critical understanding of the present situation, considering options, discussing viable and non-viable choices, and preparing the ground for deciding, establish a "language of critique" in which critical reflection, understanding, and consideration provide the "vocabulary" of the moment. Priority is given at this stage to such things as knowledge of the present trends, grasp of the current practice, and consideration of likely consequences once the decision is implemented.

In the second stage, the "language of possibility," Freire interprets change in terms of hope, involvement, and responsibility of those participating in decision-making and those most affected by it. He suggests too that the latter be those substantially involved and in direct dialogue with the former (Mackie, 1980; Hawes and Stephens, 1990).

Chapters two, three, five, six, seven, eight, and nine of this study constitute essentially the "language of critique." This chapter addresses mainly the "language of possibility" but, admittedly, briefly. The chapter tackles the question: *What can possibly be done to help reach the goal of developing an inquiring mind?* It is assumed that, given the "language of critique" addressed in this study, the reader will interpret that "vocabulary" himself or herself and come up with what is possible to be done in the light of specific circumstances and settings. This assumption becomes meaningful when it is appreciated that a particular finding in a study can *suggest* different possibilities for various people. For this reason, the study does not provide a list of *recommendations* for the reader. Instead, an attempt is made to identify basic *growth poles*, to use the language of one of my participants, which are likely to act as sources of strength and hope, and as areas of involvement, responsibility, and accountability of those who will be participants in the development of an inquiring mind. The "language of possibility" implies that the suggestions made are tentative "possibilities" that can still be turned into the "language of critique" or made problematic. The "dialectics" between the two "languages" will, hopefully, lead to appropriate "room for maneuver."

As can be seen from the interview guides (Appendices A to C), all participants were involved in making suggestions pertaining to all themes and subthemes addressed in this study. Their contributions form a key source of the "language of possibility" used in this chapter. Other sources include documents and my personal observations.

GROWTH POLES

This section dwells on the identification of some growth poles that are likely to act as springboards for development of an inquiring mind. Some possibilities for change under each growth pole are suggested.

Existing Educational Infrastructure

Most participants believed that, basically, Tanzania had developed an educational infrastructure which, if used appropriately, could provide a solid foundation to the fostering of an inquiring mind. What was needed was to orientate the utilization of this

infrastructure towards the reaching of this goal. This infrastructure included, among others, the *classroom* as the basic unit, the school, teacher education institutions, institutions of higher learning, departments and parastatals under the MOEC, particularly the NECTA and the ICD. These and other organizations, private and public, have resources and potentials that can be used *now* to foster an inquiring mind. Some of these resources and potentials are currently underutilized, misused, mismanaged, and even abused. We need to change such wasteful and mindless practices and direct whatever is available for educational improvement to meet the goal of developing an inquiring mind. The personnel constituting this infrastructure also need to change their roles, practices, beliefs, and attitudes such that they adopt and/or adapt those that are conducive to the development of an inquiring mind.

The Teacher

It was very encouraging to find that all participants, including pupils and teachers themselves, shared the belief that they were the classroom teachers and teacher educators - educator practitioners - who had to spearhead the fostering of an inquiring mind. "Our major force are our teachers," "we have to bank on teachers including teacher educators as key participants," "teachers are the most important growth pole and therefore need to be helped to manage this role," participants suggested. Their notion of "teacher" included school teachers and teacher educators. Teachers themselves appreciated the fact that teaching and learning were hardly inquiry-oriented and expressed willingness to explore the meanings of an inquiring mind and how to foster it. What was needed, they said, was to mobilize the resources and potentialities in order to cultivate a supportive environment and empower them so that they acquire the abilities, confidence, and voice to make relevant decisions and act creatively. If teacher willingness and awareness are sustained and utilized appropriately, they could constitute the greatest sources of strength in achieving the goal of developing an inquiring mind.

Resources

All participants believed that if the priority was to develop an inquiring mind in educational institutions, Tanzania was able to secure enough resources to foster this goal. Sources of strength to equip schools and teacher education institutions would continue to be both local and international. But, they also insisted that self-reliance approaches requiring maximum utilization of local resources and talents needed to be depended upon more than a dependence on foreign aid. Some participants were optimistic that there were signs of economic recovery, and that as the economy improved the government would be better able to provide more funds for education budgets which have been dwindling for decades. Furthermore, parents' contribution to the cost of education would increase as it was also contingent upon improvement in their income levels.

Some participants, however, particularly several administrators, tended to view *economic* factors, particularly *funds*, as the most crucial determinant of the possibility to reach an inquiry goal. They believed that money was a decisive factor and the sole panacea for solving all educational problems in Tanzanian educational system. Their belief was partly influenced by studies that make international comparisons of the provision of education between "developing" as against "developed" countries in order to prove that "economically, the resources available for education in developing countries are negligible when compared with the developed world" (Rust and Dalin, 1990, p. 308). Thus, according to the World Bank (World Bank, 1988, p. 15), the annual expenditure on a primary education child was US $ 50 in Africa whereas the figure was thirty times greater in developed countries. In respect of secondary education, unit expenditure per student was US $ 240 in Tanzania compared to $ 2,200 in developed countries. According to Fuller (1986, p. 5), the difference between recurrent expenditure per pupil in low-income

countries in 1980 ($ 59) was less than 2.6 percent of industrialized countries ($ 2,297), and expenditures on instructional materials per pupil in low-income countries ($ 1.69) was less that 1.9 percent of industrialized countries ($ 92.32). Furthermore, whereas industrialized countries almost doubled per pupil expenditure between 1970 and 1980, per pupil expenditure in low-income countries declined (Fuller, 1986, p. 11).

While there is no denying that the money factor is important in securing educational resources and utilization of available potentialities, it may be argued that *money is not the most decisive factor in the fostering of an inquiring mind*. Increased per pupil expenditure may not necessarily help fostering of an inquiring mind and improvement of the quality of education provided, especially when the education budget is spent on providing irrelevant and oppressive education such as that which colonizes human minds. There is evidence showing that massive expenditures on education cited above for developed countries in fact, have had no desired effect in terms of fostering an inquiring mind and improving the quality of education provided. For instance, it has been reported in a recent study (Alberta Education, 1991) that "North America research shows strong and consistent evidence that the level of expenditures on education is not directly related to student achievement and as a corollary raises questions about the apparent waste of resources"(p. 7). It was reported on CBC television's Prime Time News early this year (1993) that despite Canada spending 44 billion dollars per year on education, the quality of education remained unsatisfactory and that 30 percent of the students were dropping out per year.

Wassermann (1988) reported a teacher whose classroom "contains much high-tech equipment - an opaque projector, a cassette tape library, a language lab, a videotape recorder and playback system. The shelves in his room are filled with multiple copies of books, social studies, and science texts. In terms of hardware and software, Roger Stevens would himself affirm that his classroom is more than adequately equipped" (p. 19). Despite this very rich and highly technicalized classroom, this teacher's methods of teaching and learning were typically of the "banking" type. Wassermann (1988) writes:

> A visitor to his classroom immediately observes that there is an absence of children's work on display. A closer look reveals no sign of art or pupil projects of any kind. If pupils are involved in any cooperative learning venture, in any hands-on curriculum experience, there is no evidence of it. A morning's observation reveals that almost the entire three-hour session is spent in activities dominated by the teacher. A language activity, lasting more than an hour, consists of homework review. Pupils are asked for the correct answers to a 40-item assignment emphasizing grammatical construction. They do not speak unless recognized. Most of the time, pupils wait. They wait to be called on; they wait for the correct answers to be found; they wait for the activity to be over. In this language activity, no one engages in language except the teacher.
>
> When the language activity is over, a "thinking" activity is distributed. The type of thinking called for is primarily "low level" - recall of single, correct answers from an earlier reading. Throughout the morning, all activities flow from the teacher and are directed to the whole class. The morning drags on; "tedious" and "oppressive" are words that come to my mind (p. 19).

Wassermann finds that Steven's classroom seems representative of the state of the art across North America. The same scenario was also portrayed in the America's report called "A Nation at Risk: The Imperatives for Educational Reform" (The National Commission on Excellence in Education, 1983, pp. 11-16).

John Goodlad's extensive study of 1,000 classrooms throughout the United States found that educational reforms, much touted in education rhetoric, appear in practice to be non-events. In the United States as in Canada, textbooks predominated as the medium of instruction; telling, questioning - usually in whole-class groups - constituted the prevailing teaching method; inquiry or discovery approaches to learning were seldom evident; there was little individualization of instruction; an inordinate amount of time was spent in classroom control routines and busy work. Science and social studies instruction were heavily textbook-based, rather than being based on experiments, projects, and exploration of problems or issues arising out of the phenomena of these fields. Furthermore, they were the least emphasized subjects, taking a back seat (Goodlad, 1984; Wassermann, 1988). Even in the United States, the richest country in the world, money had not enabled it to develop an inquiring mind adequately in its schools.

Hawes and Stephens (1990) report that some studies have shown that teacher professionalism depends on the way teachers conduct themselves. What this would seem to imply is that the teacher is very much the agent of his or her own development, and that at the heart of an improvement in teacher efficiency and effectiveness is the ability of the teacher, with support, to take personal initiatives in raising standards of teaching and learning in the classroom (Dove, 1985). It appears , therefore, that changes needed to reach the goal of developing an inquiring mind seem to require not a *heavy* input of resources but rather more time, effort, and dedication or commitment on the part of the teacher. It is possible to have adequate resources in schools that are used to teach by "banking" or that are lying idle as was the case with geography equipment that was available in secondary schools, yet unused.

The basic implication of this observation is that teachers themselves must be enabled to become good inquirers: they need to learn and teach through the use of an inquiring mind. This observation makes it even more necessary to establish not only economic but other conditions and contexts that will raise teachers status and morale and thus promote their interest, commitment, and motivation to want to inquire and foster an inquiring mind. It is the teacher, not money and other economic factors *per se*, who is the most decisive factor in reaching this goal. As Hersh (1982) puts it, "the conditions for effective schooling are in our control, that more than money, it is a *will* for excellence that may best serve as the catalyst for school improvement" (p. 9).

Development of an inquiring mind will depend on the contribution and participation of various people directly and indirectly related to educational matters. Yet, the teacher will always be the key participant. It is the teacher, whose ability to decide what is most appropriate, make the best use of resources, and communicate and interact with the learners, who will make a difference. It is very necessary to genuinely empower teachers and support them so that they can make their own initiatives and decisions without waiting to be told what to do and how to do it. Lack of empowerment of teachers means that it is possible to have highly paid, rich teachers enjoying excellent living and working conditions and getting everything they need in life, and yet act like robots in the classroom. This should never be allowed to happen in Tanzanian society.

Development Plans

Related to the question of educational resources and development is the issue of planning for and assessment of national development which have traditionally been based mainly and sometimes, only on *economic indicators* such as per capita income and expenditure, Gross National Product (GNP) and the like. However, if "the ability to inquire" will be seen as a basic growth pole for national development, the yardstick for development should include people's opportunity to develop their abilities to inquire and the extent to which those abilities are used to access good housing, education, health, employment, and other basic social services, and not just focus on "economic growth" as an end in itself.

The suggestion being made here is that human development plans and programs need to include the development of an inquiring mind as the most basic component. Elements of an inquiring mind and conditions to foster them need to be the basis for drawing such plans and programs and the assessment of their success or failure. As the UNDP's World Development Report of 1991 (Daily News, May 24, 1991 p. 5) has suggested, an assessment of human development should include indicators of democracy, social justice, and dignity. The absence of factors such as freedom of press, association and demonstrations to express unhappiness, and absence of policies and laws to ensure peace, justice, equity, and human dignity are likely to stifle the development of an inquiring mind. Indeed, it is such political factors and "political will," not finance *per se*, which will determine whether national budgets and foreign aid will go for education and health and the development of an inquiring mind or for construction of white elephants, leisure, corruption, and subsidies for the wealthy.

Collaborative Support for Education

It must be made clear that to say that money is not a *decisive* factor in the development of an inquiring mind does not mean that finance in not needed or that it has no effect on teaching and learning. However, money can be used to develop educational policies, programs, and pedagogies that are peripheral or antithetical to the fostering of an inquiring mind, or which sidestep and dictate key participants - teachers and students - reducing them to the status of a robot. Spending billions of dollars or shillings on education rooted in empiricism, positivism, and academic rationalism is unlikely to support the goal of developing an inquiring mind in Tanzanian society. We need to ensure that educational finance is spent on relevant programs and efforts for developing an inquiring mind, not on its antithesis. The government's commitment to fund education needs to be increased substantially. Even the most dedicated, talented, and resourceful teacher has a limit to which he or she can improvise without funds to purchase basic teaching and learning materials. Government authorities and politicians need to appreciate the significance of fostering an inquiring mind in Tanzanian society, value and support its development, and thus view it as a high priority in educational deliberations. Development of an inquiring mind needs to be seen as a key link around which all other educational goals, plans, and programs should revolve. Fostering of an inquiring mind should be a vivid and permanent item of the educational budget in all MOEC's departments and parastatals.

In fact, development of an inquiring mind needs to be a component of budgets of all government ministries and parastatals and indeed all non-governmental organizations (NGOs). In other words, the funding of education, at least for the purpose of reaching an inquiry goal, should be a collaborative undertaking. It is erroneous to suppose that the fostering of an inquiring mind is the sole responsibility of the MOEC and the University. Other government ministries and most NGOs do have educational programs and educate. While the MOEC and institutions of higher education should be at the forefront, all other

educational institutions and units need to be responsible for the development of an inquiring mind. They need to participate in the defining of an inquiring mind, drawing programs, providing resources and creating supportive environment, and providing encouragement to all educators who will be involved in reaching this goal. The private sector, particularly various companies and factories, could prove to be an important growth pole not only as sources of resources and ideas, but also as "schools" where students would go to practice inquiry itself.

This suggestion implies that collaboration should not be limited to and among the "traditional educators" - the school teachers and teacher educators - but needs to include all those involved in teaching, making educational policies and decisions, drawing educational plans, and programs and implementing them. A consortium or network is needed to bring together all *educators* and even parents, so as to share knowledge and experiences and thinking about ways and means of making an inquiry goal a reality.

Foreign Aid

It would be very unwise and naive to suggest that Tanzania does not need foreign assistance for its development, including the fostering of an inquiring mind. Empowering rather than dehumanizing international assistance of whatever magnitude is a sign of international solidarity, mutual support, peaceful coexistence, and understanding. We must acknowledge the substantial contributions made by various donor countries, agencies, and individuals to the development of Tanzania. We have had problems, of course, in the securing and utilization of foreign assistance, and many of them have been discussed. The most disturbing problem of the "donor/recipient syndrome" (Wilson, 1992 p. 83), in my view, is the loss of dignity and freedom that some of the aids come with. Yet, not all aids have an agenda of "control and colonization" and perpetuation of the culture of silence. Truly empowering and liberating assistance provided by friendly countries, agencies, and individuals, if well utilized, will become a significant growth pole in the reaching of an inquiry goal in this country.

Some conditions attached to certain foreign assistance have had negative effects on Tanzania's development including education. The conditionality that we should reproduce ready made kits and install them wholesale in the classrooms is not only immoral but totally unacceptable. Yet, some conditions are positive and need to be observed. For instance, conditions aiming at encouraging intelligent use of resources, and curbing waste, theft, embezzlement, and misuse and abuse of public property are positive aspects of foreign aid. Those conditions aiming at making plans and programs flexible and realistic, and forcing people managing them to become responsible and accountable need to be accommodated.

We also need to seek support for the purpose of developing an inquiring mind not only of big agencies and countries but also of individuals and NGOs interested in this goal which every nation cherishes. International support needs also to be viewed as consisting not only of the provision of funds, hardwares, and softwares, but also *ideas* on and *insights* into the development of an inquiring mind. This implies that we need to continuously identify people at both local and international levels who can help blaze the trail of fostering an inquiring mind. Professional forums such as conferences, workshops, and seminars need to be organized for this purpose. Donors could support such efforts including the publication and dissemination of the products of such forums. Similar support could be provided to help the conceptualization of "an inquiring mind" and exploring avenues for fostering it as it has been attempted in chapters two and three of this study. The purpose of such aid should be to enable the involvement of Tanzanians themselves including teachers and students at the "class-roots" level, rather than having a "project appraisal team of experts" from a donor do the job for them and dominate the

process. Meaningful collaboration between local and international educators and researchers in this field needs to be encouraged. Joint ventures and projects aimed at the promotion of an inquiring mind need to be designed and undertaken.

Donor support needs to be used for widening rather than narrowing of the parameters of aid and assistance. This widening can be done by supporting and building upon activities that are succeeding or likely to succeed and operating at local levels rather than concentrating solely on large projects that are guided solely by generic, scientific generalizations. To stick to "scientism" and "specialism" is tantamount to excluding the participation of the majority of educators in reaching an inquiry goal. Donors have inevitably to aid smaller innovations, both governmental and private, so that individual and small group efforts can be harnessed and channeled to the fostering of an inquiring mind from the grass-roots level. Current efforts by the Rockefeller Foundation to provide research support to individual African scholars to pursue educational studies at such a small scale is a step in the right direction, and other donor agencies need to do likewise. Donors also need to focus on short-term rather than merely on long-term goals and improvements. This suggestion relates to emphasis on "needs now" as well as "needs later" rather than concentrating on the latter.

Efforts to build the necessary resource support base and establish better information and coordination systems is another area in which foreign aid could be used to foster an inquiring mind. Such resource support will ensure efficient and effective processing, retrieval, and dissemination of information and communication. The effort by the MOEC to open teachers' resource centers, update and reinforce library collections in secondary schools and teachers colleges, and to open libraries in 100 primary schools under the World Bank's Eighth IDA project is appreciated. However, if these centers are not properly used they are in fact likely to strengthen "banking" and help entrench the type of education that is antithetical to the development of an inquiring mind. The resource support base needs to help educators and other education workers address appropriate questions and not to design educational programs which, as Hawes and Stephens (1990) put it, "appear to prefer starting from where they are, thus confusing the "language of critique" with the "language of possibility" (p. 56).

At school and teacher education levels, a resource base needs to include facilities that will enable every teacher and teacher educator and their students to manipulate materials and use equipment or tools to produce their own products rather than merely consume those of others. The aim should be to enable educators to design a flexible, *resource-based* teaching and learning climate, not a *textbook-based* one. Hopefully, international donors will increasingly appreciate the fact that oppressive and dehumanizing aid which deprives people their ability to become self-reliant but engulfs them into the "debt traps," makes impossible the identification of "room for maneuver" to develop an inquiring mind and thus deepens the culture of silence, thereby threatening the rightful existence of humankind is unethical. Such aid must be resisted and rejected.

Teacher Education Institutions

To suggest that teachers are the most decisive growth pole in the development of an inquiring mind implies that teacher education institutions have even a greater role of preparing teachers and teacher educators who can foster effectively an inquiring mind into their students. Participants made several suggestions about how to improve teacher education, but the most basic one was that it should be inquiry-based. Teacher education must be built directly on the elements of an inquiring mind. Participants called for preparation of "better trained teachers" by "getting away from the old idea of teaching by using talk-and-chalk method" and by "adopting methods that do encourage pupils and

student teachers to analyze the notion of an inquiring mind and translate it into practice." "Teachers must be exposed to inquiry conceptually, methodologically, attitudinally and practically, and be helped to change their spoon-feeding habits," an examination officer participant suggested.

Various participants suggested that the role of the teacher should be that of a "facilitator," "enterprising and creative educator," an "unobtrusive leader," a "democratic and autonomous organizer," a "self-reliant teacher who can improvise and stop depending on the MOEC for everything he needs" and a "caring parent." Another participant suggested that "pupils should have the freedom and protection to challenge ideas, feelings, and beliefs of educators and others in an open discussion without fear of being punished or victimized." Another participant called for a *revolution* in teaching and learning: "We need a real revolution in teaching and learning methods. By revolution I mean if we can understand the fact that it is not the acquisition of facts that one gets education, then we shall begin to realize that people have various talents and can do things in different ways."

Regarding inservice teacher education, participants suggested that more inservice education is needed and must be provided; that elaborate inservice programs be initiated; that inservice education be continuous rather than occasional and intermittent; that the methodology and content of inservice teacher education should focus directly on the development of teachers' abilities to inquire and foster inquiring minds - by making these programs inquiry-based; that *all* teachers be enabled to participate in inservice activities; that supportive resources and services which teachers can use to design, adopt and adapt inquiry-based methods be provided; that teachers should be given time and space to discuss, conceptualize, and try to operationalize the concept of an inquiring mind as they teach; and that teachers need to be enabled to work collaboratively as a team rather than individually.

Indeed, we need to help teachers and teacher educators become concrete examples of good inquiry practice in which development of an inquiring mind is actually taking place. Methodology has to be designed directly on the basis of elements of an inquiring mind, and educators and students need to undergo the process of inquiry itself as they teach and learn. We need to identify and study continuously examples of good inquiry practice. Such an investigation can be done in schools and teacher education institutions, but needs to extend beyond these institutions and include education practitioners in other government ministries, parastatals, NGOs, and enterprises. We may find somewhere outside the normal school and teacher education institution an educator who can make a difference. We need to look for examples of good inquiry practice from the certified and "uncertified" teacher in private secondary schools and from within and outside the country.

These examples will be the basis for identifying teacher activities and behaviors that are supportive to the development of an inquiring mind. Such investigations may reveal that the practice of teaching which is conducive to the reaching of this goal in fact needs or necessitates more *change in attitudes* to teaching and learning than any increase in resources. For example, encouraging children to ask questions, using local resources in the immediate and extended community, encouraging students to reflect critically or collaborate in whatever they are doing, lesson preparation requiring pupils to engage in making decisions, loving and caring for children and modeling humane, democratic values are all asking for a change in the way we teachers and teacher educators perceive our roles. Such a change needs to be managed, discussed, tried out, and then evaluated by the educator practitioners themselves and not imposed onto them from above.

Another investigation essential to the facilitation of the development of inquiry-oriented teacher education programs and adopting good inquiry practice constitutes an

inquiry into models or paradigms of teacher education and teaching. Chapter three of this study illustrates such an investigation. There is a lot of literature dwelling on this issue. Zeichner (1987), Avalos (1985), Hawes and Stephens (1990) and Smyth (1992), for example, have made specific proposals that can help design inquiry-based teacher education programs. Such an investigation could also be made regarding ready-made commercial and non-commercial "thinking" programs and those on "effective teaching" in order to understand their negatives and identify and adopt their positive aspects that may help develop an inquiry-oriented educational system.

The point emphasized here is that Tanzanian educators have to be enabled to become creative and innovative, and adopt the attitude of wanting to cultivate a culture of inquiring in schools and teacher education institutions. It is proposed that *to achieve such an ethos both teacher education and curriculum development need to be partly school-based.* This approach will definitely contribute greatly to the professional growth of teachers.

School-Based Preservice Teacher Education

One way to ease the shortage of teachers and at the same time make preservice teacher education inquiry-based is to consider alternative patterns for the provision of initial teacher education. One possible "room for maneuver" could be a combination of part-time teacher education of fresh, competent student teachers at the secondary school level where they could teach some periods and learn teaching as they teach under the supervision of carefully selected experienced, competent *supervising* teachers who are themselves examples of good inquiry practice. These school-based "teacher educators" would take this role in very close collaboration with and guidance of teacher educators from the Faculty of Education and teachers colleges, and personnel from the ICD, MOEC's departments, and other people from the community who are conversant with and are interested in teacher education. The supervising teachers and other non-professional personnel would be given continuous education to enable them to take the role of teacher educators. Such an innovation would need to be carefully and properly staffed with competent, motivated and adequate professionals and be provided with supportive services and resources to avoid the danger of producing under-educated and mediocre teachers. Such school-based preservice teacher education, if well supported and managed, would be supplemented by distant (corresponding) education including the one that will be offered by the Open University.

Attempts to make preservice teacher education school-based are not new in Tanzania. The much researched and written about distant teacher education program which was launched to prepare teachers who were needed for the Universal Primary Education (UPE) program was partly school-based. Unfortunately, this preservice program was mismanaged, poorly staffed and hurriedly implemented without regard to the quality of the product. Yet the problems faced and experiences obtained from undertaking this program could be the source of strength and "room for maneuver" to design better and more promising programs for both preservice and inservice education. Besides, we need not begin with massive numbers of schools and teachers as was the case with UPE teachers. A few schools in both public and private sectors would be selected as experimental starting points.

Professional Growth of Teachers.

The success of teacher decision-making in matters of developing an inquiring mind will depend on the professional growth and development of teachers in this field. This means that Tanzania's educational system requires practical ways and means for advancing teachers' professional abilities and competencies. As has been indicated elsewhere in this study, there are several ways that can be used to promote teacher professionalism. But one "room for maneuver" that utilizes the school and teachers as a key growth pole in the development of an inquiring mind is to make both inservice teacher education and curriculum development partly school-based.

The suggestion to adopt a school-based curriculum development approach is not new in Tanzania. In 1978, N.A. Kuhanga, the then Minister for Education made the following suggestion:

> I would further suggest that a deliberate move should be made to spread curriculum development skills to more people engaged in the field of education at various levels, whether formal of non-formal. The current practice of leaving curriculum development and evaluation almost entirely in the hands of the professionals alone, keeping others out, should be discouraged, for it tends to strengthen the notion that curriculum development and evaluation is an extremely difficult undertaking which requires the mastering of lots of difficult technical jargon. At our level of development we cannot afford to encourage small guilds of specialists in areas which form the backbone of our development struggle. [To] most rural people - an expert is no more than a primary school teacher and the community development assistant. Thus, there is a need to disseminate the skill: of curriculum development not only to professional curriculum developers and evaluators but also to ordinary classroom teachers and extension workers. (Institute of Education, 1978, p. 13).

Kuhanga was addressing the problem of business metaphor and its concomitant monopolistic specialism in curriculum development matters. Bayona (1988) and Punch and Bayona (1990) have even proposed a model which, in their views, would guide school-based curriculum development and maximize teacher participation and decision-making in this process. Mbeo (1975) made the same suggestion towards the promotion of an inquiring mind in secondary schools. To date however, these suggestions have not been utilized. It is now time the ICD considers taking this suggestion very seriously, as the current top-down model with which it is operating cannot help empower teachers and students by giving them the power and authority to make decisions and inquire. To become an effective growth pole for the development of an inquiring mind, the ICD needs to change its role - from that of merely producing a single textbook and simple teachers' guide and rubber-stamping imported, ready-made kits, to be installed wholesale in the classroom, to that of providing supportive services and resources to enable schools to become genuine and strong centers for developing inquiry-based curricula and offering inservice education. There will of course be other levels of curriculum development, but these other levels need to view the school as the basic center where all other efforts should converge and be translated into reality with teachers and their pupils as equal participants in the designing and implementation process, not mere consumers. The purpose of all curriculum development centers should be to redirect their focus from the traditional preoccupation with funded knowledge of the academic disciplines to the inquiry process itself.

There are several advantages of school-based approaches to preservice and inservice teacher education and curriculum development. The approaches will enable all

three educational endeavors to operate together and support one another at a single center. The approaches will enable economic utilization of resources and minimization of costs. School-based teacher education and curriculum development will be cheap to run and will result in maximum utilization of available resources, services, and ideas. Some methods and resources intended for a preservice course may be used for inservice program or designing a school curriculum. Action research, for example, could be used in all three deliberations at the same time. Serving teachers and student teachers could be encouraged to undertake collaborative projects. The products of such projects would not only be the source of intrinsic motivation but would also contribute to the easing of current shortage of appropriate instructional materials. A deliberate focus on the production of relevant teaching and learning materials as one of the major goals of utilizing these approaches will stimulate the use of resources locally available in the community; junk will now be viewed as valuable resources for creating inquiry-based school and college materials. The approaches will enable teachers and student teachers to learn as they teach continually, and thus save time and funds which would be spent on traveling to attend teacher education elsewhere.

Indeed, school-based approaches to teacher education and curriculum development will act as intrinsic motivators for teachers by minimizing the effects of the top-down model of decision-making. Besides causing decisions about content and process to be made out of the context of the learners and instruction, the top-down decision-making model tends to overlook the "proximity principle" that "in order that curriculum activities develop effectively, decisions should be made as close as possible to the point of implementation. The motivation and vitality of the persons involved with the development of the curriculum rises sharply with their sense of identity with the activity undertaken. The things we do are much more vital than the things they require us to do" (Stewart, 1968, pp. 29-30). A related advantage is that the benefits accruing from these approaches will be felt and utilized immediately in the classroom practice. A teacher or student teacher is likely to try out an innovation while undergoing the course, rather than relying on transfer of training through multiplier effect which does not happen anyway.

School-based approaches to teacher education and curriculum development are most likely to encourage collaboration among teachers within a school, between schools, and between teachers and other personnel such as curriculum developers, teacher educators, researchers, inspectors, and others who will come to schools not as "commanders" but as resource persons who are a source of insights into the development of an inquiring mind and as learners as well. School inspectors, who have consistently stressed a summative rather than formative role in their work, will have to change their practices and attitudes towards teachers and pupils and become developers of an inquiring mind, not an educational "military force." Teacher educators would establish a link between school-based teacher education and university- and college-based teacher education in matters of designing programs, initiating, and conducting various research and other projects, field experiences - particularly single lesson teaching practice, assessment, and several other fields. A possible arrangement would, for example, be to design a college-and-university based teacher education program aimed at availing school-based student teachers the opportunity to learn at those institutions. Through such collaboration, these approaches would minimize, if not eliminate, the artificial gap between preservice and inservice teacher education and have them serve one another and resolve the contradiction between theory and practice.

Another advantage of these approaches is that they will enable inservice teacher education and curriculum development to reach all serving teachers. The approaches will be a practical way of enabling *all* teachers to get the opportunity to be involved in inservice activities, unlike the "gun shot" "hit and miss" approach which avails such activities to only a handful of teachers intermittently, leaving the majority frustrated. The suggested

approaches would prove extremely useful to private secondary schools where the majority of teachers have not received any teacher education and those few who have had no opportunity to attend even occasional inservice courses offered in the public school system. There is no "magical" program that can enable even a quarter of serving teachers in Tanzania to avail inservice teacher education with the current approach. The only realistic approach to improve the academic and professional status of teachers in both public and private secondary school systems is to teach them as they teach at their workplaces.

The suggested approaches will also enable inservice education and curriculum development to be a permanent feature of the education system. The approaches will also ensure the consistency and continuity of the innovations. One way of introducing new ideas in Tanzania's educational system has been a long and varied record of *pilot* projects which in fact never piloted anyone anywhere. Most innovations introduced this way have failed to take root due to lack of continuity resulting from failure to involve teachers in the introduction and management of such innovations. If managed by teachers at school level as they teach, school-based innovations and efforts to develop an inquiring mind will no longer depend on the external expert for their existence and continuity. There will no longer be a worry about important innovations, projects, and programs collapsing or being terminated when experts leave or donor agencies withdraw their support. In fact, not only are the suggested approaches likely to build up a core of local expertise at school level but also use effectively and efficiently the existing expertise where it is most needed. School-based teacher education and curriculum development will ensure self-sustainability of efforts to develop an inquiring mind in Tanzania's educational system.

Another advantage of these approaches is that school and teacher education administrative personnel is likely to focus on professional role supportive to the development of an inquiring mind, rather than merely an administrative role. Training and recruitment of educational leaders should be based on the ability of such personnel to provide supportive context and ideas that are conducive to the fostering of an inquiring mind. For instance, a start would be for the head of the school to gather his or her staff together one day and focus attention upon, say "effective inquiry-oriented methods for teaching a large class" or "how to design an inquiry-oriented program by using available resources and talents." Initiatives like this might well produce quite unexpected results, particularly if the staff from more than one school and with different levels of experience and knowledge-base could be brought together to discuss such issues of curriculum, teacher education, and teaching.

A related implication is that all those involved in these approaches will be required to learn as they participate in the facilitation of the approaches. The approaches will not be made a reality by teacher educators and administrators who do not want to think about, design, and learn new inquiry-oriented methods of teaching and learning, or those who think that teaching in lower levels than they are currently teaching is "lowering their professional and academic status." Most important of all is the fact that the suggested approaches should in fact be seen as an invitation to think about a new philosophy of and approaches to curriculum development, teacher education, and teaching.

Languages: Kiswahili and English.

The language problem has been discussed at length in chapter nine due to its significance to the development of an inquiring mind. It is a complex issue that will need genuine commitment and change of attitudes and values on the part of policy makers, educators, parents, and children themselves. Despite this problem, however, Tanzanians should see themselves as lucky to have Kiswahili and English as their languages for day-to-day communication, business, culture, and education. Both languages are important

growth poles not only for development of an inquiring mind in the classroom, but for establishing conditions necessary to foster it.

As a national language, Kiswahili has enabled Tanzanians to evolve a strong culture of unity - to build a united, peaceful nation in which there is ethnic and religious harmony. With Kiswahili, it has been possible to evolve an educational system in which scientific and technological and other kinds of specialized knowledge now available in Kiswahili has moved from the hands of "experts" to the masses of workers and peasants through basic and adult education. About seventy percent of Tanzanians in the labor force today can communicate orally and read basic materials in Kiswahili language (World Bank, 1990, p. 11). Kiswahili has facilitated the exchange of ideas among Tanzanians in all walks of life and at the family level. We have been able to gain independence, self-confidence, self-consciousness, dignity, political awareness, and pride in ourselves partly due to Kiswahili language.

Yet, it would be absolutely wrong and naive to claim that the English language has contributed nothing to these achievements. Tanzanians have been able to understand the world, interact with foreigners, learn new ideas, and make international contacts and friendships through the English language. English continues to be the language of instruction at secondary and higher education. English continues to help Kiswahili grow. Rather than continuing to stress the differences and contradictions between the two languages, we need to emphasize the positive aspects, and understand the supportive interactive dialectics between these languages.

We also need to think seriously about forming an appropriate policy to cater for the profitable use of both languages in teaching and learning. For example, when I did my Territorial Standard Eight Examination in 1958, we were allowed to write the examination either in Kiswahili or in English. The British colonizer had a flexible policy in this regard. We need now a similar flexible policy. For example, an experiment would be conducted to have certain secondary schools teach in English and others in Kiswahili, and let children and their parents decide the medium of language which they prefer, but have English a compulsory subject in a Kiswahili medium school and Kiswahili compulsory in an English medium school. If the choice would be to adopt Kiswahili as a medium of instruction in secondary schools, English could be a compulsory subject for all pupils. Other options are possible and need to be explored seriously. If current ambivalence about the language of teaching and learning is allowed to continue it will definitely stifle seriously efforts to develop an inquiring mind.

It is possible now to improve the teaching and learning of both languages. Efforts should be made to design inquiry-based approaches for the improvement of language instruction. Besides, collaboration among all teachers in a school would facilitate language teaching. If school-based inservice workshops addressed the problem of how each teacher would help pupils in his or her class to improve English proficiency and how they would collaborate to draw remedial courses and team teach for this purpose, rather than wait for aid from abroad, much would be accomplished in a short time with positive results without substantial increases in costs. Such efforts would also improve the language proficiency of teachers themselves.

The Students

Teacher and teacher educator participants responded to the question: *What do you hold about your students' ability to inquire?* It was very encouraging to find that all these educators believed that the majority of their students - pupils and student teachers - had the potential to learn how to inquire. What was required was to change the way they were

being taught, the curricula, the examination system which encouraged "book learning," and rote memorization of discrete information that had to be regurgitated on demand, and most important, to change the attitudes held about students' abilities to inquire. These educators found that students were in most cases being viewed by teachers and teacher educators as unable to conduct meaningful inquiry just as teachers and teacher educators were being viewed by authorities at the top. The result was a kind of vicious cycle of lack of confidence in educators and students to be able to conduct sound inquiry. Consequently, this attitude itself deprived educators and students the opportunity to inquire. Attempts to engage them in inquiry oriented activities, particularly through school-based inquiry approaches will help change such attitudes and avail students and their educators the opportunity they deserve to learn and conduct meaningful inquiry.

Primary Education

All participants, including pupils themselves, noted that one reason for poor performance of some students was the weak background of their primary education. They observed that secondary school pupils who came from "good" and "high status" primary schools, and English-medium ones, did well in secondary schools. Whether or not this claim is valid needs extended investigation.

What is certain, however, is that, on the whole, primary education in Tanzania was being accorded the lowest status when compared with other levels of education. This low status seemed to manifest itself in a number of ways. Educators and decision-makers in the majority of aspects of primary school policies usually lacked any experience of working in the sector. There has been a bizarre situation where teacher educators of primary school student teachers were actually people promoted to the tertiary sector from secondary level, and thus lacked experience of teaching in primary schools. The attitudes and expectations of those people charged with deciding issues pertinent to the primary education sector are primarily influenced not by concerns and problems of primary school teachers and pupils. The frames of reference and practices of these personnel are influenced by the institutional ethos of the institutions of higher education in which they were educated and the centers in which they now work.

An analysis of preservice teacher education programs at both college and university levels reveals absolute absence of deliberate focus on primary education issues. Furthermore, the Faculty of Education has never thought of starting a Department of Primary Education, a unit or "stream" which as its primary focus is primary education. There are only three "streams:" secondary education, teacher education, and adult education (University of Dar-es-Salaam, 1987; 1992). Primary education at this level has been neglected, though graduates from this institution teach student teachers in teachers' colleges who go to teach in primary schools, who become principals of those teachers' colleges, and develop curricula for primary schools and primary school teachers' colleges.

Another erroneous assumption is that, though it is more difficult to teach the young children than older secondary school students, better and more educated and experienced teachers were regarded as more needed in secondary than primary schools. The most lowly qualified teachers were the ones on which teaching at the primary level depended. This situation is absurd, considering the significance of nurturing the delicate brains of our young children to enable them to develop inquiring abilities at this very tender age. What is urgently needed is to think about how we can raise the status of primary education. For, poor educational foundations at this level will most likely hamper from early age our children's ability to inquire for the rest of their lives.

The Family

All participants believed that development of an inquiring mind also depended on how children were brought up in our families which indeed constituted the nuclei of the society. The ability of the family members to inquire depended on the kind of education they got formally, informally, and non-formally.

It is very encouraging that the MOEC has started a special unit to oversee the provision of family education and counseling of students. The ICD was also developing a curriculum with a focus on good parenting, problems of drug abuse, and prevention of AIDS and environmental education (Ministry of Education and Culture, 1992). These moves, coupled with current steps to improve children's health through immunization and other programs, compulsory primary education which has enabled the country to register 90 percent enrollment at this level, adult education programs which have enabled the country to achieve over 90 percent literacy rate, and Tanzania's commitment to implement the Declaration of the Survival, Protection and Development of Children and the Convention of the Rights of Children, and to observe yearly the day of the African child, are likely to help sensitize the family and society to the significance of good parenting. Adult education, in particular, needs to teach adults not only numeracy and literacy but also how to inquire, the importance of development of an inquiring mind, and how parents would foster this goal in their own families. The society should also ensure that the family does not decay and disintegrate, and that useful African family values are protected and strengthened rather than rejected for want to imitate blindly or ape foreign lifestyles which are incompatible with the healthy nurturing of children. Drug abuse is a case in point. The anthropology and sociology of "extended familyhood" is another case in point. All Tanzanians need to reflect critically on family issues so as to design family education programs within and outside the school system that ensure that our children become good inquirers right from their homes at a very tender age.

The National Examinations Council

All participants believed that the development of an inquiring mind will be an impossibility in secondary schools and indeed all other educational institutions if the NECTA did not make deliberate and concerted move to orient examinations towards the facilitation of an inquiring mind. "If we won't change the type of questions we ask in the examinations and texts, we will not succeed to foster an inquiring mind. If we will change the program content and methods, but the examinations remain unchanged, teachers and students will not accept the new programs but will go for what is examinable by the Examinations Council," a professor participant observed. True, the way the power of examinations is currently operating will never allow the development of an inquiring mind to be a reality in schools and teacher education institutions. We need fundamental revolution in the thinking and practice of educational evaluation. The examiners need to come forward boldly with creative ways of assessment that will ensure that curriculum development, teacher education and teaching do serve the inculcation of an inquiring mind. It was encouraging that both participants from the NECTA were aware of the degree to which the examination system hampered greatly the reaching of this goal. This awareness needs to be translated into real action in order to emancipate education from the dictates of evaluation practices and beliefs totally rooted in empiricism, positivism, and academic rationalism. For this reason, the National Examinations Council of Tanzania becomes one of the most critical growth poles in the development of an inquiring mind in this country.

SOME CONDITIONS FOR SUCCESSFUL DEVELOPMENT OF AN INQUIRING MIND.

Democratic Ownership And Control of Decision-Making

The fact that Tanzanians cherish and support democratic ideals, that democratic principles are the basis of Tanzanian political ideologies, and that the ESR policy itself is intended to inculcate democracy, all constitute a central condition to foster an inquiring mind in this country. The principles of cooperative endeavor, participation, and collective leadership suggest a collaborative rather than top-down model of decision-making. However, this study reveals that the dominant model of decision-making has been a top-down one in which decisions are made by some central authority, then passed along the chain of command until they are carried out by teachers. As Lanier (1982) puts it "like foot soldiers in the army (and especially "in the trenches"), the teachers' role has been to follow orders, not to make decisions. In this model, questions of school improvement center around questions of (1) what teachers should be told to do and (2) how they should be made to do what they are told" (p. 28).

I have shown in the study that this "tell-the-teacher-what-to-do-" and "see-that-they-do-it" model is embedded in the philosophical and psychological paradigms and practices that can hardly foster an inquiring mind. This model must have been responsible for the difficulties that may have been faced in the cultivation of a truly democratic culture in Tanzania. This model of decision-making has confined the educators to the role of mere technicians who are good at consuming rather than thinking seriously and producing knowledge and reflecting critically upon what is taken for granted. It is a model that breeds and nurtures the culture of silence and its concomitants. Should Tanzania emphasize seriously the development of an inquiring mind, this "top-down" approach has to be discouraged and abandoned.

Yet the suggestion made by some participants to adopt a "bottom-up" or what Lanier (1982, p. 31) calls a "top-heavy" as against "bottom-heavy" system is by itself inadequate to establish a truly collaborative ethos. For, neither practitioners at the local level, nor administrators and politicians at the center are capable of solving in isolation all of the problems pertaining to the development of an inquiring mind. The "top" and the "bottom" are and should be interdependent, sharing and caring, in all matters regarding the fostering of an inquiring mind. Education workers from all levels - top, middle, bottom - need to capitalize on the strengths they possess collectively by communicating democratically knowledge and good practice and by collaborating much more, particularly at school level. In order to achieve such effective participation and partnership within schools and across external levels in the education system, governance of the educational system needs to be highly democratic and open.

Sharing the Responsibility and Being Accountable

Equality in ownership and control of decision-making and genuine collaboration implies readiness for, and equality in accepting responsibility for the outcomes of our educational deliberations to foster an inquiring mind. Take an example of curriculum development: when the curriculum is owned and controlled from one location (schools or center), responsibility for implementation tends to be disjointed. Responsibility for major decisions needs to be shared appropriately between teachers and other participants from all levels in the struggle to develop an inquiring mind.

If we encourage devolution of power and authority, we equally need to focus on the notion of *accountability*. Being held accountable to what we agree to do through democratic

process might reduce the rhetoric and force us all to look to areas of "room for maneuver." But both, sharing responsibility and accountability, require a high degree of *trust* among the participants. As Hawes and Stephens (1990, p. 190) suggest, trust should be seen as a professional characteristic to be called for openly and demonstrated in the way we deal with such issues as examination reform and decentralization of decision-making. Trust can be realized through shared activities involving negotiation: sitting down together, trying to resolve tensions and discussing the roles that different patterns at different levels in the system can play to achieve desired ends; identifying common criteria and models of good practice; and collaboratively identifying and defining goals, and ways to reach them.

Change of Attitudes and Values

An administrator interviewee commented that "an attitude of mind is at the center of all educational problems." Then he continued: "I am convinced that if we are not going to change our attitudes, from the top level of the government, on what we think should be the most appropriate learning environment, we are going to maintain this type of tradition [of not developing an inquiring mind]. Without change in our attitudes, moves to change the system to develop an inquiring mind are bound to fail." The findings in this study have proved this participant's observation to be correct. Persistence of traditional methods of teaching; failure to interpret appropriately the concept of an inquiring mind; belief in academic rationalism; top-down model of decision-making; belief in curriculum development and implementation as instrumental action; belief in empiricist, positivist, and rationalist paradigms of teacher education and teaching, educational research, and evaluation; limited funding of education; and, other observations all have to do in one way or another with the attitudes of those people involved in respective fields.

It is normal that individuals or teams will hold conflicting views and aspirations. Relations between individuals and teams will be constrained because of aspirations in power and authority. "Deep-seated beliefs in "what has been working for me for years" and conflicting frames of reference, conscious and unconscious, are likely to lead to contradicting belief systems. While there is no doubt that the development of an inquiring mind will require us all to change those values and attitudes that are a hindrance to the reaching of this goal, the major question is how to change them. The sure way of changing constraining attitudes and values is inquiry itself: if educators and all those involved in the fostering of an inquiring mind will work with a genuine spirit of achieving this goal, they will have to examine their own belief systems and attitudes and subject them to critical reflection. Inquiring into our own attitudes, values, and aspirations will have to become part and parcel of our "language of critique" and "language of possibility." Reactionary, oppressive, undemocratic, dictatorial, uncooperative, and other attitudes and values that are anti-inquiry will have to be abandoned in favor of those that are pro-inquiry.

Several instances in which we need to change our attitudes and values have been cited in this study. Another crucial area in which we need to examine our frames of reference is the need to develop science and technology in Tanzania. There is no doubt that efforts to develop science and technology are not unfounded. In a science-and-technology dominated era towards which the world is heading, the teaching of this education cannot but be emphasized. Yet, it is unrealistic and naive to suppose that Tanzania will develop science and technology, and "catch up" with technologically developed countries if we will invest in this field and neglect other fields of knowledge or give them only lip service. The best approach to this problem is to appreciate the fact that all fields of knowledge "speak to one another," support, and develop each other. It is extremely significant to understand the dialectics between them. Every "scientific" and "technological" achievement has a "non-scientific" and "non-technological" aspect to it and vice versa. How, for instance, can music be non-scientific or non-technological while it is about the science of sounds and the

technology of musical instruments? How can one claim that history is non-scientific and non-technological while science and technology are the real substance of the history of all ages?

Another related attitude we need to change is the tendency to value "everything foreign" and viewing traditional science and technology as primitive and worthless. The danger with this attitude is to confuse the "language of critique" with "language of possibility" which leads to "false consciousness" and "false starts" with consequent waste of resources and limited progress. This attitude may have contributed to the tendency by some key authorities to neglect research undertaken by Tanzanian scholars in favor of research done by foreign experts. One good example is my own study (Mbeo, 1975 pp. 144-146) in which I suggested the establishment of "educational service centers" for educators at district, regional, and national levels. This suggestion is similar to the one made by the World Bank experts (World Bank, 1990) regarding TRCs. Lack of utilization of research done by local scholars not only results in waste of resources but also causes the demoralization of Tanzanian researchers. Much effort and many resources will be saved and used profitably if most of our cherished values and attitudes that hamper critical thinking, creativity, reflection, decision-making, problem-solving, metacognition, and other elements of an inquiring mind to take root in the education system and in society as a whole will be discouraged.

Flexibility

Day-to-day teaching and learning and other activities are inevitably influenced by different cultural, environmental and other local factors. No matter how pervasive a given problem may be, there are likely to be as many possibilities for solving it as there are different local situations. The inflexibility caused by the practice of constraining teachers across all schools to utilize the same centralized syllabi, textbooks, methods of teaching, rigid timetables, examinations systems, and patterns of control in the Tanzanian educational system is necessarily at some point in tension and totally incompatible with unique regional and local realities and the wide difference between learners and communities, and with the unpredictability of world events. The unfortunate assumption is that all schools are more alike than they are dissimilar in all localities, and that all pupils have similar abilities and competencies in the learning process. But we are all aware that the reverse is true. This situation can be reversed by adopting the principle of flexibility, a condition that needs to permeate every endeavor in the process of developing an inquiring mind - pedagogy, administration, curriculum, assessment, or whatever. The principle of flexibility is especially cogent if curriculum relevance to local needs, to "needs now" associated with teacher participation in decision-making is to be achieved.

Realism

At times, educational decision makers have overlooked or even probably deliberately ignored the importance of facing realities in planning or drawing educational programs and courses of action. For instance, the decision that each pupil had to cultivate two hectares of land - an order which, if actually implemented, would have required more land than the entire area of Tanzania - was absolutely unrealistic. The decision that students contribute twenty-five percent of the upkeep costs is rather unrealistic. It is impossible for most schools to achieve this goal due to local circumstances. To expect diploma teacher education institutions to prepare a teacher who can develop an inquiring mind through crash programs which are academic rationalist and where pedagogy is taught theoretically for about a month or so out of two years is not based on reality. To increase the duration of teacher education from three to four years, and extend the period for teaching practice without fundamental change in the existing ethos of teacher education and teaching is

unrealistic. To expect an educational system to foster an inquiring mind through the promotion of textbook-based teaching and learning which is reinforced by the projects to produce a textbook and examinations based on knowledge funded in those textbooks is equally unrealistic. Many findings in this study about the factors that have tended to hinder the development of an inquiring mind could indeed be attributed to lack of realism in dealing with various crucial issues. What is needed is to use some imagination and identify "room for maneuver." Reliance on making decisions based on an inquiring mind will most likely minimize such unrealistic situations.

To achieve realism and flexibility, we need to cultivate the spirit of experimentation. Rather than requiring educators to follow to the letter standard curricula, official guides, guidelines and regulations from above, they need to be allowed to experiment with new ideas, innovate and thus enable them to utilize and develop their fullest potential. Productive research which focuses on "needs now" needs to be encouraged among educators. Channels of communication between those traditionally expected to provide a critique - researchers and theoreticians (particularly the universities) - and the practitioners in schools and teachers colleges need to be improved. The traditional gap between "researchers" in institutions of higher learning and practitioners who are usually assumed to be mere "implementors" of research result from both applied and basic studies is a serious antithesis of the need to foster an inquiring mind, because it amplifies the contradictions between the two and makes collaboration among them impossible to achieve. Such improved communication will require changes in attitudes of those university scholars and intellectuals who tend to believe that teachers and pupils can hardly do research or reason at par with them.

Indeed, lack of confidence by top authorities in the ability of local personnel to conduct research and provide appropriate "language of possibility" extends to institutions of higher learning as well. Mosha (1990, p. 66), for example, reports that Tanzania spent 39 billion Tanzanian shillings to pay for foreign consultants in 1987 alone, while local personnel who would provide the same or even better services were available and either unused or underutilized, a form of wasteful labor imbalance. Change of attitude towards the utilization of such local personnel is needed. The antipathy towards the learned is not productive and is, in fact, dehumanizing and should be discouraged. Gone should be the days of marginalizing and frustrating Tanzanian intellectuals; they need to be trusted as a key growth pole in the development of an inquiring mind and national development.

Educational Legislation

Changes in the educational system are not likely to guarantee success in the development of an inquiring mind if they are not facilitated and supported by the policies relevant to this goal and which place major participants at center-stage. Current educational decision-making in Tanzania is highly centralized. It has been suggested, on the other hand, that development of an inquiring mind requires that decision-making and responsibilities be shared across all levels of education, and among teachers and other participants. This sharing cannot be achieved unless a new legislation is established to ensure that an inquiring mind is made central in educational deliberations and conditions to develop it are guaranteed. A new policy has to be officiated by an Act of Parliament that amends the current various educational Acts in order to enact others which cater for school-based curriculum development process and school-based preservice and inservice teacher education and other reforms that recognize the centrality of teachers as a major growth pole in the meeting of the inquiry goal. Some interviewees complained about the undue interference of some government officials and politicians in educational matters in order to satisfy their personal vested interests. In fact a curriculum developer participant suggested enacting a law that should discourage such interference which induces lack of continuity

and consistency in the initiation and development of educational innovations. Such legislation needs to force mindless authorities to refrain from issuing orders and mandatory guidelines which are in conflict with the ethics of sound educational practice, and misusing and abusing educational resources.

This suggestion is an invitation to review the entire current Education Act of Parliament and other Acts guiding the deliberations of MOEC's parastatals such as NECTA and ICD so that they are repealed and new ones are enacted for the purpose of supporting and protecting the development of an inquiring mind. Such Acts will have to recognize the significance of democratic participation and collaboration between all people who will be involved in the process, and the crucial role the teachers will have to play in it. Yet, it must be ensured that such legislation will not be manipulated in a way that endangers the freedom of people and educational institutions to engage in inquiry without fear of being persecuted and oppressed. Indeed, all kinds of educational legislation must necessarily be subjected to continuous inquiry and be repealed according to new findings, perceptions, and conceptualizations of educational phenomena.

SUPPORT FOR THE GOAL OF DEVELOPING AN INQUIRING MIND

It was assumed in this study that one indication for the existence and continuity of the goal of developing an inquiring mind in Tanzanian society was the extent to which the goal was supported and appreciated by the participants, particularly teachers and teacher educators and key officials. It was for this reason that all participants, except pupils, were requested to respond to the following question: *Do you think it is worthwhile to continue implementing the goal of developing an inquiring mind? If yes, why? If no, why not?*

The answer to this question was a resounding "yes." "Should continue," "must be implemented; there is no short-cut," "is essential," and "should be a permanent goal for all generations to come" are some of the expressions that participants articulated in support of the goal. Virtually all interviewees found it a worthwhile educational goal. "It is not just worthwhile, it is a must," a participant emphasized.

Several reasons were given by participants to rationalize their support. Some of these were that the development of an inquiring mind will enable students to think and be creative, innovative and autonomous, and democratic inquirers and decision-makers; become self-reliant citizens able to understand this world; liberate their minds and emancipate society from independence of dependency. Others believed that the fostering of an inquiring mind is a necessary condition for human and national development and growth; that it enables people not to be merely dictated and controlled, but helps them to control their own destiny. One participant expressed the importance of development of an inquiring mind by saying:

> The goal is basic for democracy and human development. You cannot become truly self-reliant and independent without it. An inquiring mind is basic to any intellectual and social development. You cannot hope to thrive on people who simply move by the wind, who are swayed by the opinions of others. In order to really develop democracy in society everybody must be able to contribute something to society. What you contribute originates from your mind. If you cannot inquire into something and make real critical analysis into issues, then you cannot contribute anything. You are just a much follower of what others have said, and that is no good for democracy. When you have people who simply accept whatever comes, who cannot think or make searching inquiry into various issues, then there is no democracy any more. Then you end up having a clique of clever

> people who rule over you because you are not able to contribute any idea. That is why I agree with that point. My answer would be a resounding yes.

This strong support should be taken seriously and be seen as one of the most important growth poles that are most likely to aid the development of an inquiring mind in Tanzanian educational institutions. It is a growth pole on which other growth poles depend, and thus must not be allowed to wane. It is therefore suggested that collaborative groups of researchers, educators, teacher educators, curriculum developers, inspectors, educational administrators, students, student teachers, and others should be formed immediately to further sum up the "language of critique" and "language of possibility" and come up with concrete "room for maneuver" and action plans for beginning seriously to develop an inquiring mind in Tanzanian educational institutions.

SUMMARY

This chapter forms the conclusion of the study. It has explored the "language of possibility" for reaching the goal of developing an inquiring mind. The possibilities looked at constitute some "growth poles" which are likely to act as sources of strength and hope, and as areas of participation, responsibility, and accountability in the fostering of this goal. The chapter has also suggested some conditions for the successful promotion of the development of an inquiring mind. A call has been made to form collaborative groups for the purpose of exploring further the "language of critique" and "language of possibility" and to come up with plans and actions for meeting this goal. This task needs to begin immediately at all levels of the educational system, particularly in teacher education institutions. The value of this study does not lie in its content *per se*, but in its potential to *illustrate* the type of studies that may be conducted to explore the avenues for fostering an inquiring mind in Tanzania's and other educational institutions.

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APPENDIX A: INTERVIEW GUIDE FOR TEACHERS AND TWO TUTORS

1. Would you please tell me briefly about yourself and your experience of teaching in this school/teachers college - secondary education, teacher education, work experience, teaching subjects, duties, workload, classes taught, and changes made in teaching and learning in this school.

2. How do you assess the teaching situation in [this] secondary school/teachers college in relation to the goal of developing an inquiring mind? How far have we met this goal?

3. What factors have tended to hinder the realization of the development of an inquiring mind in [this] secondary school/teachers college?

4. How is the concept of "an inquiring mind" conceptualized and understood by various people and in literature in relation to teaching and learning?

5. What is your own view or understanding of the concept of "an inquiring mind" [If you were requested to talk about the goal of developing an inquiring mind to a group of student teachers who want to know its meaning, what would come to your mind?].

6. Do you know any research or studies done on this goal of developing an inquiring mind?

7. Do you know any articles, books or other references written by Tanzanians or other people on the concept of "an inquiring mind" and how to develop it in teaching and learning?

8. Do you know any project(s) which has/have been designed solely for the promotion of the development of an inquiring mind in secondary schools/teacher education institutions?

9. (a). How do you assess the role of the Institute of Curriculum Development in the promotion of an inquiring mind?

   (b). What problems is the ICD facing in executing its roles?

10. How do you assess the role of the National Examinations Council of Tanzania in the promotion of an inquiring mind?

11. (a). How were you taught geography when you were a secondary school pupil?

    (b). How do you compare that teaching situation with the current one in secondary schools?

12 (a). How do you assess the suitability or relevance and problems of teaching and learning the current geography syllabus for secondary schools/teachers colleges?

    (b). How do you assess the suitability or relevance and problems of teaching and learning the current education syllabus for diploma course?

    (c). To what extent are geography practicals conducted and what are the problems involved?

13. What are your views about the use of a textbook?

14. (a). What is your assessment of the degree to which continuous assessment projects which you did in school and teachers college as part of final national examinations helped you to learn how to inquire and thus develop your inquiring mind?

(b). What problems are/were related to the undertaking of these projects?

15. What do you hold about your students' ability to inquire?

16. (a). As a student teacher, what specific content of your teacher education program(s) dealt with the development of an inquiring mind?

(b). What specific teaching and learning activities involved you to understand the concept of "an inquiring mind" and help you learn how to foster it?

(c). How were you taught (i) education, (ii) teaching methods, and (iii) geographic content and practical geography?

17. To what extent were you engaged in the interpretation of the concept of an inquiring mind in education courses?

18. To what extent do you think the cultural context of your teacher education institution(s) affect your understanding and ability to foster an inquiring mind?

(a). Did teacher educators have a clear philosophy of their own about teaching and learning?

(b). How was that ethos communicated to student teachers?

(c). How did that ethos influence student teachers' opportunity to develop their own inquiry abilities and how to foster an inquiring mind?

(d). Did teacher education institutions help student teachers develop their own philosophical views on teaching and learning?

19. To what extent did teacher education programs emphasize (i) theory, (ii) practice, and (iii) integration of both through inquiry-oriented activities?

20. How do you assess the extent to which the teaching of educational research and evaluation helped you to develop research and evaluation skills, processes and dispositions that promoted your ability to inquire and foster an inquiring mind?

21. How do you assess teaching practice (practicum) in preparing you to become a teacher/tutor who is able to develop effectively students' inquiring minds?

22. What suggestions would you like to make regarding the preparation of teachers and teacher educators who can develop effectively students' inquiring minds?

23. Which inservice courses did you attend aimed at enabling you to understand the concept of "an inquiring mind" and how to develop it?

24. Deacribe the activities or projects you have been involved in intended to promote your understanding of the concept of "an inquiring mind" and how to foster it.

25. Deacribe an innovative teaching project you have initiated and accomplished for the purpose of developing an inquiring mind?

26. What problems are related to the provision of inservice teacher education?

27. What suggestions would you like to make regarding the promotion of an inquiring mind through inservice teacher education programs?

28.(a). What type of self-reliance activities are conducted in secondary schools/teacher education institutions?

(b). How and why are these activities conducted?

(c). What problems are faced in initiating and running them?

29.(a). How do you assess the teaching and learning of vocational programs and problems involved?

(b). Would you like these programs to continue? If yes, why? If no, why not?

30. Do you think it is worthwhile to continue implementing the goal of developing an inquiring mind ? If yes, why? If no, why not?

31. What factors or conditions do you think will help promote the development of an inquiring mind?

32. Now that you know my project, do you have any questions that you may wish to suggest for this study?

APPENDIX B: INTERVIEW GUIDE FOR PUPILS

1. (a). How do you assess the way you are taught geography?

   (b). Who asks who questions in the classroom? [Teacher to student; student to teacher; student to student].

   (c). How often are questions used by the teacher and how?

2. (a). How are notes given to you?

   (b). To what extent do you understand those notes?

3. (a). What topics have you been taught which you feel you do not understand?

   (b). What other topics do you find difficult to understand?

   (c). What topics do you understand?

4. (a). How are geography practicals conducted?

   (b). Which practical geography exercises have you done so far?

   (c). Which practical geography topics have you not done?

   (d). Which practical geography topics do you find difficult/easy to understand?

   (e). What equipment/instruments have you used to do practical geography exercises?

5. How do you work in the classroom?

   (a). How do you sit?

   (b). How often do you work in groups?

   (c). How often do you share what you know with your classmates?

6 (a). How often do your geography teachers give you the assignments?

   (b). What types of assignments are you given?

   (c). Do teachers mark your assignments and give you the feedback? How often do they do so?

7. What are your opinions regarding:

   (a). Tests and examinations set by teachers in this school?

   (b). National examinations set by the NECTA?

   (c). Continuous assessment: tests, character assessment and projects?

8 (a). Which textbooks have you used to study geography?

(b). How do you get them?

(c). To what extent do you understand their content, and why?

(d). What other sources of information do you use to study other than the textbook, and where do you get them?

(e). Have people, including parents, been coming to a class and/or school for the purpose of teaching you something?

9 (a). How often do you use the library and for what purposes?

(b). Which libraries do you use?

10. What are your opinions regarding the medium of teaching and learning? What problems are related to this issue?

11. What other problems that tend to hinder your smooth learning at this school?

12. How are you involved in self-reliance activities?

13. Do you think vocational programs should continue to be taught? If yes, why? If no, why not?

14. What characteristics, qualities and abilities do you think a typical outstanding teacher should have?

15. Would you choose teaching as your first choice of your future career?

APPENDIX C: INTERVIEW GUIDE FOR ADMINISTRATORS, PROFESSOR, AND GROUP INTERVIEW WITH TUTORS

1. How do you assess the teaching situation in the secondary schools in relation to the goal of developing an inquiring mind?

2. What factors have tended to hinder the realization of the development of an inquiring mind in secondary schools?

3. How is the concept of "an inquiring mind" conceptualized and understood by various people and in literature in relation to teaching and learning?

4. What is your own view or understanding of the concept of an inquiring mind? [If you were requested to talk about the goal of developing an inquiring mind to a group of student teachers who want to know its meaning, what would come to your mind?].

5. Do you know any research or studies done on this goal of developing an inquiring mind?

6. Do you know any articles, books or other references written by Tanzanians or other people on the concept of "an inquiring mind" and how to develop it in teaching and learning?

7. Do you know any project(s) which has/have been designed solely for the promotion of the development of an inquiring mind in secondary schools/teacher education institutions?

8. To what extent do you think teaching practice helps student teachers and tutors to learn how to foster an inquiring mind?

9.(a). What type of self-reliance activities are conducted in secondary schools/teacher education institutions?

   (b). How and why are these activities conducted?

   (c). What problems are faced in initiating and running them?

10. (a). How do you assess the teaching and learning of vocational programs in relation to the development of an inquiring mind?

    (b). Would you like these programs to continue? If yes, why? If no, why not?

11. (a). How do you assess the role of the Institute of Curriculum Development in the promotion of the development of an inquiring mind?

    (b). What problems is the ICD facing in executing its roles?

12. How do you assess the role of the National Examinations Council of Tanzania in the promotion of an inquiring mind?

13. Do you think it is worthwhile to continue implementing the goal of developing an inquiring mind? If yes, why? If no, why not?

14. What factors or conditions do you think will help promote the development of an inquiring mind?

15. Now that you know my project, do you have any questions that you may wish to suggest for this study?

16. Can you suggest for me another person whom you think can help me just as you have done?

APPENDIX D: TIME-LINE

1. **First Week of July 1990**: Traveled to Tanzania.

2. **The Rest of July and August 1990**: Prepared interview guides, sought research clearance, and made sampling of schools. Collected the documents.

3. **September 1990**: Conducted trial interviews, and made initial contacts with secondary schools in Dar-es-Salaam city and Dar-es-Salaam Teachers' College. Made appointment with the first participant from the MOEC headquarters. Collected the documents.

4. **October and November, 1990**: Made the first round of visits to schools in Morogoro, Dodoma, and Bukoba to select the participants, and conducted interviews with the heads of schools, teachers, and pupils. Made classroom observations, and collected documents. Conducted group interviews with tutors at Dar-es-Salaam Teachers' College, and interviewed some teachers in Dar-es-Salaam city.

5. **December 1990 and January 1991**: Interviewed the participants from the MOEC headquarters, and tutors at Dar-es-Salaam Teachers' College. Collected the documents.

6. **February, March and April, 1991**: Made the second round of visits to conduct further interviews and make classroom observations in the selected schools in Morogoro, Dodoma, and Bukoba. Interviewed participants from the MOEC headquarters, NECTA, ICD, Dar-es-Salaam Teachers' College, and secondary schools in Dar-es-Salaam city. Collected the documents. Participants verified the data.

7. **May, 1991**: Made the last round of visits to conduct further interviews and make classroom observations in the selected schools in Morogoro, Dodoma, Bukoba, and Dar-es-Salaam city. Participants made verification of the data. Collected the documents.

8. **June, 1991**: Conducted an interview with a professor participant from the Faculty of Education of the University of Dar-es-Salaam and some teachers in Dar-es-Salaam city. Participants from Dar-es-Salaam city schools and the two tutors from Dar-es-Salaam Teachers' College verified the data. Made library research in the education library of the Faculty of Education, the main library of the University of Dar-es-Salaam, the ICD's library, the library at the MOEC's headquarters, and Dar-es-Salaam Teachers' College's library. Sought help from the National Kiswahili Council of Tanzania for translation of some terminologies from interviews and documents.

9. **First and Second Week of July, 1991**: Collected the documents. Made travel arrangements and returned to Edmonton.

APPENDIX E: A LETTER FOR RESEARCH CLEARANCE

UNITED REPUBLIC OF TANZANIA

Cables: ELIMU, DAR ES SALAAM
Telephone 27903 & 27211
In reply please quote:

MINISTRY OF EDUCATION
P. O BOX 9121
DAR ES SALAAM.

Ref. No. ED/A3/10/RP/VOL.II/164

Date 16/08/90

To:

REGIONAL EDUCATION OFFICERS
DAR ES SALAAM, COAST, MOROGORO,
IRINGA, MBEYA, DODOMA, KAGERA.

RESEARCH CLEARANCE: FOR MR. F.E. MBEO

This is to introduce you Mr. F.E. Mbeo a graduate student in Education at the University of Alberta - Canada. He is currently in the country for data collection and research on "Inquiry Teaching in Tanzania".

The Ministry of Education has granted him permission to conduct his research in some secondary schools and Teacher Colleges in your regions. By copy of this letter, you are requested to give him maximum cooperation and support to enable him carry the study smoothly.

Yours Sincerely,

C.J. Hongoke
for PRINCIPAL SECRETARY.

QUOTATION OF REF. NO. ESSENTIAL