*Factors that Influence Professional Educators' Participation in Virtual*

*Communities:  If We Build It, Will They Come?*

by

Barbara Jane Kelly

*Submitted to the Faculty of Extension*

*University of Alberta*

*In partial fulfillment of the requirements for the degree of*

*Master of Arts in Communications and Technology*

*August 2005*

## Acknowledgements

# Table of Contents

# Abstract

Based in social exchange, organizational identification, and social network theories, this study explores professional educators' use of virtual communities. The provincial regulatory body of professional educators, the British Columbia College of Teachers (BCCT), is committed to improving communication with its members to facilitate stronger organizational identity and identification. To determine if members will participate in a BCCT virtual community, an important question is: What factors influence professional educators' participation in virtual communities?

Four factors are investigated by mail survey: technology, content, social interactions, and outside influences. Results show that educators have access to and are comfortable with Internet technology. They use e-mail and non-community websites regularly to access information but rarely use computer-mediated communication (CMC) for social interactions. Interactive CMCs, such as chats and virtual communities, are seldom chosen. The few who do participate in virtual communities indicate having few outside influences to draw them away from participation.

The findings suggest that educators will not participate in a BCCT community at this time. However as they gain experience using virtual communities their assessment of the value of this CMC may change. The BCCT should continue to monitor educators' CMCs to identify new channels of communication – and identification – with its members.

# Introduction

The British Columbia College of Teachers (BCCT) is the legislated, regulatory body of education professionals in British Columbia. Its mandate, according to the *Teaching Professional Act* (1996), is:

> To establish, having regard to the public interest, standards for the education, professional responsibility and competence of certificate [of qualification] holders and applicants for certificates of qualification and, consistent with that object, to encourage the professional interest of certificate holders in those matters. (§4, revised May 2004)

Recent amendments to the *School Act* (1996) and Section 19 of the *Teaching Profession Act* (1996) have tied certificate validity to payment of an annual fee to the BCCT, which means that even those holding a non-expiring certificate of qualification will have the certificate cancelled if they fail to pay the annual BCCT fee. Previous to this change it was possible for an individual to hold a valid certificate without paying the annual fee, although payment was legally required of all public school teachers, administrative officers, assistant superintendents of schools, and superintendents of schools (*School Act*, 1996).

While having little impact on educators practicing in the public school system, those holding certificates and working in other areas, such as independent school systems, and those on leave or retired have been patently affected by the legislative change. The change increased the BCCT membership markedly and raised awareness of the organization significantly. More than ever, certificate holders, government, media, and the public are interested in the activities of the BCCT. Communication with these groups and its educational partners has become paramount within the daily activities of the BCCT.

In the most recent strategic plan – released by the Council in August 2003 and acting as both an observation of past performance and a prognostication of the recent legislative changes – the second and third goals commit to the provision of "effective communication with members of the College, education partners, and the public" and to "improve the ability of the College to respond to information needs, both internally and externally, by enhancing the technological capabilities" (British Columbia College of Teachers [BCCT], 2003, p. 4). These goals are intrinsically tied and support the Council's covenant to protect the public interest, celebrate the work of the profession, and create a revived identity of both the education professional and the profession.

Until very recently, the communication technologies employed by the BCCT were inadequate for providing the interactions necessary to develop a strong organizational identity among its membership and within the public forum (e.g., limited use of e-mail, static website). The BCCT had failed to keep pace with advancements in technology. Continued inadequacy in keeping current with technological business standards and lack of initiative, support, and participation in communication processes with stakeholders would serve to negate both the impact and the advancement of other objectives of the strategic plan (Appendix A).

### Current Status

In 2004 the BCCT Council and senior management determined and initiated a restructuring of the organization to support the new direction and strategic plan. In support of the second strategic goal to improve communications, a position was created to establish a new image for the organization and to improve communication with the media and public. A new department, headed by the Director of Professional Education and Communications, was also created to address the challenges presented by both the strategic plan and, more recently, the

legislative changes that have demanded improved avenues of communication with both members of the College (holders of certificates of qualification) and the general public.

In 2003 and 2004, the Registrar and members of the Council became heavily involved in face-to-face meetings with educational partners, such as local and provincial Parent Advisory Councils (PACs), school trustee associations (STAs), school administrative associations (PVPAs), the British Columbia School Superintendents Association (BCSSA), and others. These meetings raised the profile of the BCCT and allowed accurate information about its activities and responsibilities to be distributed and discussed. In 2005, the BCCT and its activities have been popular topics in the media, particularly in newspapers and radio news and interview shows. This has raised both member and public awareness of the organization and has increased demands on the BCCT communications systems significantly.

To address the third strategic goal of enhanced use of communications technology, the BCCT has pledged resources to plan and implement an upgrade of the technology used to support communications. Improvements include the creation of a dynamic, database-integrated website, conversion to a digital record keeping system, and use of e-mail as a primary method of communication. E-mail has been instituted as a primary source of both internal and external communication in all departments. An improved, more interactive website has been successfully instituted, with further stages of interactivity and personalization for members still to be implemented. An advanced, customized electronic records keeping system, which will eventually be linked to the website, is currently being developed and will soon be in the prototype stage. Preliminary upgrades of the office telephone system are in place and improvement of the telecommunications infrastructure continues. The BCCT has moved substantially closer to meeting the technological standards necessary to interact in the multi-

channel and immediate fashion that business, industry, and the general public have come to expect.

To more effectively address its objective of improving communications with members, the BCCT must also consider the socio-psychological aspects of engaging members, educational partners, and the public in regular interaction. In doing so, the BCCT will focus on transforming not only its own identity but that of all educators as well. Particularly through active communication with its members, the BCCT has the opportunity to initiate a social network in which the relationships between the participants will serve to bond educators with one another as a group and to bridge the profession with the rest of society.

Due to the geographical, scheduling, and financial challenges associated with face-to-face interactions, it is practical for the BCCT to consider using Internet technology to foster development of a network of individuals committed to the profession and desirous of participating in activities and social interactions aimed at creating a strong professional identity. Providing an online gathering place – a virtual community – in which members, partners, and the public can meet and exchange information and ideas while developing social relations over time is an option.

### *The Problem*

The problem is not a technical one but a behavioural one: If the BCCT builds a virtual gathering place, will they come? The number of groups and sub-groups with which the BCCT is mandated to interact is vast. Should the virtual community involve all groups?  What is the best way to structure the community to promote participation from different groups? Is there one group, more than others, that is critical to success of the community?  How open should the

community be?  What type of resistance, if any, is the BCCT likely to encounter?  Who should "run" the site? The questions abound.

Faced with a challenging journey, the key is taking the first step: Determine the feasibility of using a virtual community to improve communications with members, education partners, and the public. The scope of communication partners is wide; it will be necessary to focus more closely on a particular population. The holders of BCCT certificates of qualification – its membership – are the largest group with which better communication must be established. It is also the most critical: without its membership, the BCCT would not operate. As the largest and most critical group, the membership will determine the usefulness, success, or failure of a virtual community supported by the BCCT. It is this population on which interest falls. The question then becomes, "What factors influence professional educators' participation in virtual communities?"

## *Operational Definitions*

Within the research question, there are four concepts that must be defined: factors, virtual community, participation, and professional educators.

### *Factors.*

Four broad categories of factors are considered: technology, content, social interactions, and outside influences.

*Technology* refers to the technical means that allow participation in a virtual community, including the skill set required to use online technology. *Content* refers to the purpose of the community, its activities, and the information and materials available there; it encompasses the usefulness of the community to its members. *Social interactions* refer to the types and levels of

interaction and activity. *Outside influences* refer to activities that compete with the virtual community for the members' attention and time (Appendix B).

 *Virtual Community.*

 Abercrombie's Dictionary of Sociology states, "the term community is one of the most elusive and vague in sociology, and is by now largely without specific meaning" (as cited in Preece, 2000, p. 175). Prior to the Industrial Revolution, "community" was defined by a geographical area in which people lived their entire lives and exchanged resources and support in a self-sufficient manner (Jones, as cited in Preece, 2000). Since the Industrial Revolution, the original understanding of community has evolved as new technologies (e.g., improved methods of transit and communication) have moved geography out of the critical criteria used to define community. Today, most sociologists accept that geographical commonality is not a requirement for community (Figallo, 1998; Garton et al., as cited in Preece, 2000; Hiltz & Turoff, 1993; Kim, 2000; Wellman, as cited in Preece, 2000; Wellman & Gulia, 1998). Although a geographical area may be a component of a community, it is no longer integral to the concept. Kim has a nice approach to this dilemma when she explains that "community can't really exist without gathering places" (p. 29); she describes community as "a group of people with a shared interest, purpose, or goal, who get to know each other over time" (p. 28). Preece sees community as a process, an entity that develops and evolves through social interactions. A sense of purpose, voluntary participation, and enduring existence are more critical than physical locality (Kim, 2000; Preece, 2000).

 Clearly, with such ambiguity surrounding the term community, the term "virtual community[1]" is equally equivocal, if not more. Cothrel & Williams (1999) define a virtual

---

[1] For purposes of consistency with other literature, the terms "virtual community" and "online community" will be considered to have the same meaning and to be interchangeable.

community as "a group of people who use computer networks as their primary mode of interaction" (¶6). Kim (2000) explains that "all communities need gathering places … [that] can be a mailing list, a discussion topic, a chat room, a multiplayer game, a virtual world, a web site, or some combination of these spaces" (p. 27). The BCCT currently has a website, but this is not a virtual community – participation and development of content by the membership is not possible or encouraged. At present, the website is a place to obtain information, not a place for exchange of ideas, knowledge, stories, and interests; members do not interact and the site's existence is not dependent on member participation. "To achieve their purpose, all communities must first meet one basic requirement: they must engage and involve members" (Cothrel & Williams, 1999, What is an on-line community, and what makes one successful section, ¶3). As well, communities need to create a sense of value for the members; this can also be described as a sense of community.

Some researchers argue that a distinction between the online "space" of a meeting place and the "sense" of community that grows out of the interactions there must be distinguished (Abdelnour Nocera, 2002; Cothrel & Williams, 1999; Jones, 1997). For purposes of this study, *virtual community* will refer to both the physical location of the online "space" in which the community exists and, more importantly, the sense of belonging and sense of community that is created as a result of the social interactions that occur there. Community is a "gathering place" (Kim, 2000, p. 29) possessing a sense of purpose and value, voluntary participation, and enduring existence in which relationships develop and grow (Figallo, 1998; Kim, 2000; Preece, 2000).

*Participation.*

Participation is generally accepted to mean active contribution to the community over time (Hiltz & Turoff, 1993; Preece, 2000; Wellman & Gulia, 1999), however Preece points out that "repeated, active participation" (p. 13) is difficult to quantify. In this study, participation is dependent on the factors that influence levels of participation: technology, content, social interactions, and outside influences. There is a broad scope of participation within virtual and non-virtual communities, ranging from non-participation through to high participation.

In a virtual community, non-participation means that the individual does not visit the gathering place at all, even if s/he qualifies to be a member of it. Participation can range from visiting the community once to visiting it daily; it can involve "lurking" (not revealing one's presence to other community members) to active, visible participation. It is critical to have active participation by at least a portion of the membership in order for the community to survive.

To be a community, the members must be engaged in the activities and social interactions to create a sense of belonging. If the host provides all the activity in the community, a sense of reciprocity does not exist, it is not a true community. Many researchers discuss the importance of active participation by members (Cothrel & Williams, 1999; Figallo, 1998; Hiltz & Turoff, 1993; Kim, 2000; Millen & Patterson, 2002; Preece, 2000; Wellman & Gulia, 1999); however caution against underestimating the value of passive community members is warranted. As Cothrel and Williams discovered, "both 'givers' and 'takers' contribute to the vibrancy of their community" (What works in facilitating OLCs section, ¶8). Many community members play both roles and "the experience of obtaining valuable knowledge builds a sense of indebtedness that ultimately will be expressed in contributions when that person has something of value to share" (Cothrel & Williams, What works in facilitating OLCs section, ¶8).

Preece (2000) points out that "repeated, active participation" (p. 13) is difficult to quantify. The initial goal of the BCCT is to draw members into the community whether as lurkers or active contributors. As a result, for purposes of this study, *participation* is defined by visits – whether lurking or visibly active – that members make to virtual communities. Questions concerning active participation and contribution to virtual communities are addressed but are not the sole determinant of participation in a virtual community; questions investigating lurking activities are also included.

### *Professional Educators.*

This term identifies the population that is being examined. *Professional educator* refers to anyone who holds a valid certificate of qualification issued by the BCCT regardless of his/her position, employer, or status of employment. A certificate of qualification is also known as a teaching certificate and is valid if either no expiry date appears on it (non-expiring qualification) or the expiry date shown has not yet passed (interim qualification) *and* the holder of the certificate has paid the annual certificate fee to the BCCT. Because certificate validity requires payment of the annual fee, it implies membership with the organization, so the terms *BCCT member* and *professional educator* can be used interchangeably.

## Literature Review

In 2002, Contractor and Monge presented the Multitheoretical, Multilevel (MTML) model to study the management of knowledge networks. In knowledge networks, "intelligence resides in the network as a whole rather than in particular nodes" (Contractor & Monge, p. 249); nodes may be people or groups of people or nonhuman entities, such as databases. The MTML model "argues that no single theory can account for complex motivations that inform our decisions to forge, maintain, or dissolve knowledge network ties" (Contractor & Monge, pp.

250-251); psychological, social, and communicative theories that help explain why the nodes forge, sustain, or discontinue knowledge network ties must all be applied. The model also holds that "motivations for developing knowledge network ties operate at multiple levels, including individual links, dyads, triads, cliques, and at the global level of the entire network" (Contractor & Monge, p. 251).

It is reasonable to apply this model to other networks, including social ones, to gain a better understanding of the ways in which ties are created, maintained, and untied. Due to the complexity of the issues being explored here, it is reasonable to investigate professional educators' participation in virtual communities using more than one theory.

This study is based in three theories representing three developmental phases of a virtual community: social exchange theory, organizational identification theory, and social network theory. The study is not, however, a critical test of these theories. Instead, the theories are used heuristically to provide definition and preliminary understanding of the issues facing the BCCT as it strives to improve communications and stronger bonds with its membership and to strengthen both its and its members' identity and identification through social interactions with them. These theories, and the critical issues associated with them, provide the contextual framework for describing the challenges facing the BCCT and for the development of the study.

Social exchange theory predicts the likelihood of members to participate in a virtual community (where participation includes passive activity); this is particularly vital during the critical start-up phase of a community. Organizational identification theory, couched in symbolic interactionism, predicts the development of group consciousness and identity; this is important to building a sense of belongingness and community and is critical to the BCCT's goal of creating a new identity for itself and its members. Social network theory describes social relationships and

the bonding (strong) and bridging (weak) ties that they create; this is essential for the long-term survival and growth of the virtual community. A review of each theory is followed by a discussion of the critical issues and associated literature that were considered in the design of the methodology and research instrument used in this study.

### *Social Exchange Theory*

Drawing from both economic and behavioural psychological theory (Beebe & Masterson, 2003), social exchange theory predicts that individuals will participate in a relationship if the benefits of participation outweigh the costs. This theory suggests that BCCT members will participate if the benefits of participation more than offset the costs.

Although significant throughout the life of a community, virtual or not, social exchange theory forecasts the probability of BCCT members to participate in the early development of a virtual community, which is critical information in assessing the probability of success and, thus, whether or not the BCCT should provide a virtual community venue for its members. If enough interest does not exist to carry the community through its start-up phase, there is little reason to create the opportunity. Patterns in the factors that influence professional educators' use of virtual communities will provide insight into the costs and benefits this group associates with participation. Survey questions address factors that impact members' assessment of the costs and benefits of participation.

### *Organizational Identification Theory*

The BCCT wants to change the relationships that it has with the public, its educational partners, and its membership. In particular, it wishes to alter the way that its members identify with the organization. The BCCT plans to work in a more participatory fashion with its

membership; more open communication, interactions, and collaboration and less conflict and/or apathy.

In 1985, Cheney and Tompkins presented their organizational identification theory, which includes elements of control, identification, and identity. It is a complex and multi-faceted theory but, for purposes of this paper, only one prominent element of it will be considered. According to Cheney and Tompkins' (1987) theory, when an organization presents a new identity, its members must form a new identification with it: the *identity-identification duality* (Littlejohn, 2002). This duality states that "who we are in an organization, our identities, determine to a certain extent the identifications we forge. At the same time, our identifications shape who we are, our identities" (Littlejohn, 2002, p. 297). This process may result in either stronger or weaker ties with the organization. By being more open and conciliatory in its approach, the BCCT is aiming to strengthen ties with its membership.

Tompkins and Cheney believe identity-identification duality is integral to the social structure within an organization and to the development of the identity of both the individual nodes within the organization (e.g., departments, employees, related partners, associates, members, etc.) and the organization itself. In the case of the BCCT, increasing professional educators' identification with the provincial professional regulatory body will increase the sense of professionalism educators incorporate within their identity. This new identity-identification duality will also transform the public's perception of educators.

As well as identifying with their profession, educators also identify with the public: a change in their perception of themselves, along with an observable association between the BCCT and professional educators, will influence the identity-identification duality that exists within society between the public and professional educators. In addition to educators

themselves having an enhanced self-identity and identification with the BCCT, the public will develop an enhanced identity of both professional educators and their professional body, the BCCT. Because identity-identification duality is couched within relationships, this research project is based in social network theory.

## *Social Network Theory*

Network theory is rooted in the belief that the structure of any organization (biological, mechanical, economic, etc.) is determined by the patterns of interactions amongst its members (or parts). Social network theory (SNT) relates specifically to patterns of human interaction. Monge & Eisenberg (as cited in Littlejohn, 2002) define three traditions in SNT: positional (examining roles and their functions), relational (examining the patterns that emerge from natural relationships and interactions), and cultural (examining symbols, rituals, and repeated actions that carry meaning). Organizational identification theory is primarily concerned with the relational tradition of SNT. Based on the major theoretical frameworks of sociology outlined by Neuman (2003), this approach falls into the symbolic interactionism framework, and is being approached primarily from the direction of interpretive social science. The key to organizational structure is not the individuals, or nodes, within the network, but the interactions or relationships between those nodes (Dunn, 1983; Preece, 2002; and, McPhee, Monge, Stohl, Taylor, Weick, as cited in Littlejohn, 2002).

## *Critical Issues*

There are a number of sociological elements that are pertinent to the research topic. The focus is on those that are important for success of a virtual community: engagement, critical mass, bonding and bridging ties, and social capital. These elements are part of the MTML approach being used to understand, address, and study the complexities associated with

strengthening the identity-identification duality between the BCCT and its membership and the feasibility of creating a virtual community in which it can occur.

"A successful community serves a clear purpose in the lives of its members and meets the fundamental goals of it owners" (Kim, 2000, p. 1). The first few months of existence are crucial to the success of a virtual community. Many have extolled the importance of engaging members, both initially and on an ongoing basis (Cothrel & Williams, 1999; Kim, 2000; Kollock, 1996; Millen & Patterson, 2002; Preece, 2000; Sempsey & Johnston, 2000; Steinfield, 1992). Content and social interactions are the factors being examined here that are likely to have the highest impact on engagement. Engagement is successful when interactions lead to development of strong bonds between two parties. To draw in new members, however, a community must also foster weak bonds with those from a variety of disciplines and groups; too many strong bonds without a portion of weak bonds will result in elitism and will stifle community development.

Engagement is crucial to achieving the critical mass of participants required for success of a virtual community. It is also integral to development of social capital within a group. Within a BCCT virtual community, it will be critical to initially engage members across different age and employment categories to foster strong (bonding) and weak (bridging) social ties that will advance the critical mass required to ensure a lasting community and lead to creation of the social capital necessary to foster the identity-identification duality that the BCCT hopes to encourage.

*Engagement.*

Many sources acknowledge the critical role that engagement plays in a successful virtual community (Cothrel & Williams, 1999), particularly in the early period of existence. It is critical to understand the purpose of the community (Cothrel & Williams, 1999; Kim, 2000; Preece,

2000) and to select the most appropriate type of gathering place for that purpose. Several researchers cite repeated participation by individual community members as key to a successful community at start-up and throughout its life (Cothrel & Williams, 1999; Figallo, 1998; Hiltz & Turoff, 1993; Kim, 2000; Millen & Patterson, 2002; Preece, 2000; Wellman & Gulia, 1999). Without social engagement of members, critical mass (see below) cannot be achieved and the community will not exist. Social exchange theory predicts the likelihood of engagement: individuals will participate if the costs do not outweigh the benefits. The higher the benefits are over the costs, the higher the level of engagement that will occur. Strong engagement will allow the BCCT to create a new identity for itself as well as for educators (organizational identity theory) and will provide opportunities to develop a social network (SNT) in which members of the profession create both strong, cohesive bonds within their population and vital bridging links to the rest of society.

*Critical Mass.*

Markus (1990) bases critical mass theory in Rogers' diffusion of innovation theory, while Steinfield (1992) describes it as a derivative of public goods concepts and collective action theories (Oliver, Maxwell & Teixera, and Olson, as cited in Steinfield, 1992). It is a threshold model that describes the minimum number of active participants that must be present in order for a group to attract others and continue to exist (Markus, 1990; Preece, 2000) and, as such, allows "for interdependence in individuals' decisions to adopt" (Markus, p. 197). Preece points out the difficulties in quantifying this number and suggests that "as the Internet continues to grow … the concept of critical mass is likely to [grow] to include not just a lower bound but also upper bounds" (pp. 91-92). While some have attempted to put a number on the critical mass of groups

(Hiltz & Turoff, 1993), determining the pivotal number of each group is difficult and varies among communities (Markus, Morris & Ogan, and Rice, as cited in Preece, 2000).

Research in the usefulness of critical mass theory in virtual communities is proceeding; Preece (2000) lists several recent studies in this area: Nonnecke and Preece (2000), Smith (1999), and Whittaker, Terveen, Hill and Cherny, (1998). Markus (1990) looks at the significance of the heterogeneity and production function of resources and interests as they apply to online communities. These are basic concepts of the critical mass theory of Oliver, Marwell, and Teixeira (as cited by Markus), which holds that in order for critical levels of participation to occur there must be variation in the interests and resources that individuals bring to the community and an accelerating production function – "successive contributions generate progressively larger payoffs" (Markus, p. 201). There appears to be a relationship between the strong and weak social ties as well as social exchange theory (discussed previously) and the concept of critical mass.

Although difficult to quantify, critical mass is an important concept, particularly in the early days of a virtual community. Hosts must ensure that active participation of a core group of regular visitors is occurring and that new members find the topic or topics attractive enough to participate themselves. Steinfield (1992) points out that it is dangerous to rely on critical mass theory in isolation because it does not describe why users are attracted to particular groups and/or online technologies; this supports the concept of the MTML approach.

*Strong (Bonding) & Weak (Bridging) Ties.*

Integral to engagement and critical mass are social ties or links, the connections that create the social network. Researchers identify two types of ties: strong, or bonding, ties and

weak, or bridging, ties (Figallo, 1998; Granovetter, 1982; Kim, 2000; Norris, 2002; Preece, 2000; Scott, 2000; Wellman & Gulia, 1999).

Strong ties are cohesive. Metaphorically they are often described as familial. Wellman and Gulia (1998) explain that they are marked by frequency, "companionable contact" (p. 179), mutual reciprocity, supportiveness, and longevity. The density of interactions that occur within strong ties bond a network together internally; they provide depth within a social network (Norris, 2002).

Weak ties are loosely bound, analogous to casual acquaintance. They are important, among other things, for gaining exposure to new and different ideas, gaining information, and making new social connections (Granovetter, 1982; Preece, 2000). Not all weak ties serve these purposes but those that do are called bridging ties because they act as bridges between social networks (Granovetter, 2002). They provide breadth within a social network (Norris, 2002).

While the advantages of strong ties are easily understood, it is more difficult to understand the significance of weak ties. Several researchers believe that weak ties play an important role in the development of online communities (Granovetter, 1982; Norris, 2002; Preece 2000; Wellman & Gulia, 1999). Norris performed survey research of different online groups and found that professional groups experience strong (bonding) ties slightly more than weak (binding) ones, but their virtual communities serve both since both breadth and depth of social networks are important to this group.

Trust and loyalty is developed through the cohesiveness of strong bonds (Figallo, 1999). By developing strong links out of formerly weak ones, and revitalizing already strong ties through regular online interactions, not only are relationships focussed on more than information, but both critical mass and social capital are developed within the community as well.

*Social Capital.*

Social capital refers to the infrastructure, such as networks, norms, and social trust, that governs the relationships between individuals in a society. A high level of social capital facilitates coordination and cooperation for the mutual benefit of all members of a community; a low level of social capital is detrimental to all members of a community.

During the early days of the Internet, many observers were concerned about the impact time spent online would have on the social capital of physical groups and communities and the strong ties associated with many of those activities (Kraut, Kiesler, Mukhopadhyay, Scherlis & Patterson, 1998; Putnam, as cited in Preece, 2000; Sullivan, Borgida, Jackson, Riedel, Oxendine & Gangl, 2002). Research, however, has shown that both strong and weak ties have prevailed and even increased as a result of Internet relationships (Norris, 2002; Putnam, as cited in Preece, 2000; Putnam, Portess & Landholt, and Edwards & Foley, as cited in Norris, 2002).

Norris (2002) raises some interesting questions about social capital and the bridging and bonding ties that exist in virtual communities. The infrastructures of most communities, both physical and virtual, include both bonding and bridging ties and fall somewhere on the spectrum stretching between all homogeneous associations and all heterogeneous ones. In general, both types of communities can improve social capital, but the homogeneous ones can become dangerous and detrimental (e.g., the Klu Klux Klan) while heterogeneous ones more consistently build social capital by improving understanding and interpersonal trust and binding society as a whole.

Homogeneous groups sometimes are so closely bonded in physical proximity and/or in common philosophy that the opportunity for the development of bridging ties is limited, if existent. Norris (2002) gives the example of socially homogeneous neighbourhoods of cities like

Los Angeles or Belfast, in which bonding ties are so predominant that bridging ties are unlikely to be strong enough to have any significant effect. Norris investigates if, in these situations, a virtual community would serve to help the development of the bridging ties that cannot be formed in the physical world. He investigates how "territorial and online communities overlap and interact … [with] the particular focus of study [being], *do online groups serve a bridging or bonding function for society as a whole?*" (Norris, p. 4). The results of Norris's study suggest that "the Internet serves both functions" (p. 11) and that "online participation has the capacity to deepen linkages among those sharing similar beliefs as well as … cut[ing] across at least some traditional social divisions" (p. 13).

## Methodology

The exploratory nature of the research question and the fact that the BCCT does not currently host a virtual community narrow the range of methodological options for addressing the question. Other limiting factors include cost, availability of the researcher's time, the provincial geography and size, and the fact that there are over 60,000 members of the BCCT.

A review of previous research suggests that a self-administered questionnaire distributed to a convenience sample of BCCT members is an acceptable and valid approach for exploring the factors that may determine whether BCCT members will participate in a virtual community. The low response rate (20% - 30%) that typically characterizes a mail-out questionnaires is addressed through variation of a technique specifically designed to improve the response rate (Cui, 2003), Total Design Methodology (TDM).

### *Previous Research*

The vast majority, and most relevant, of articles and studies reviewed here have employed survey methodologies**,** using questionnaires, interviews, or a combination of both to

collect information (Cothrel & Williams, 1999; Millen, Patterson, & Costanzo, 2001; Sempsey & Johnston, 2000; Sullivan et al., 2002). Abdelnour Nocera (2002) gives a detailed outline of symbolic and cultural investigation using the ethnographical process of observation, participant observation, ethnographic interviews, and analysis. Anderson and Kanuka (1997) employ a mixed methodology approach, using questionnaires, telephone interviews, and computer logs (surveys), and transcript analysis (case study). Garton, Haythornthwaite, and Wellman (1997) provide an encompassing examination of Social Network Analysis (SNA), which they describe as being related to group communication approaches to research. SNA is significant in that is represents a shift from the unit of analysis being the individual to being the relation; SNA researchers study the interactions and relationships between social beings. SNA is widely used in the observation and analysis of social network theory (SNT). Software programs designed for the recording and analysis of online interactions between social beings are widely used in SNA. However, because a virtual community does not exist at the BCCT, the application of any software tool is impossible.

### *Options for This Project*

While an absence of a virtual community hosted by the BCCT rules out the application of SNA to measure members' use and participation, application of a census approach to survey BCCT members faces other limitations. With a membership of 64,922 (BCCT Information Technology Coordinator, personal communication, May 4, 2005), the cost and time requirements to contact every member of the organization, ensure sufficient response levels, and compile and analyze the data, whether by interview or by self-administered questionnaire, is prohibitive. Time is also a limiting factor in conducting interviews of a sample of the membership that will accurately represent the whole; the number and length of such interviews are prohibitive.

An ethnographical approach is possible – the researcher is also a member of the BCCT – however, as with SNA, the virtual community in which interactions with other members will occur does not yet exist and there is little to observe at this time. As a result, this research project follows the lead of other respected researchers and uses data collected from a self-administered, mail-out questionnaire to measure the independent and dependent variables addressed in the research question.

## *Research Objectives*

The research objectives are:

- To identify specific factors related to technology, content, social interactions, and outside influences that determine whether or not BCCT members use virtual communities.

- To determine if different groups within the population, as determined by employment classification, are influenced by the factors and use virtual communities differently.

- To determine the type and levels of participation by BCCT members in virtual communities.

The operational definitions outlined in the previous section guided the construction of the self-administered questionnaire that was distributed to a sample of the BCCT membership. Questions focus on actual use of virtual communities and factors that do or do not encourage participation in virtual communities within four areas: technology, content, social interactions, and outside influences. A definition of *virtual community* is provided for the respondents in the questionnaire (Figure 1, Appendix C) and the questions are designed to reveal factors that influence respondents' participation (either passive or active) in such a community. Through this

process, factors that either encourage or discourage both passive and active participation in virtual communities are revealed. This information may then be considered in the determination of whether or not it is reasonable for the BCCT to develop and host a virtual community.

## *Population*

The research question sets the population parameter, which is the membership of the BCCT. The sampling element (unit) is a member (holder of a valid certificate of qualification), the geography is British Columbia, and the time is bounded within the 2004-2005 membership year[2], between March and April. The target population, because it comprises the principal portion of the BCCT membership – 56.73% (see *Sample Size*, p. 29) – and the most active, consists of educators within the public school system in British Columbia.

## *Sample Selection*

A convenience sample is employed. Because the BCCT does not yet have policies in place to allow researchers access to its database of certificate holders it is not possible to select a representative, stratified sample from the entire population. Instead, a single public school district in which the local authority is empowered to grant confidential access to its database for research purposes was selected.

There are sixty public school districts within British Columbia. A single school district that proportionally mirrors the target population as closely as possible is therefore desirable. The district selected is comprised of 347 BCCT members that represent a full spectrum of employment classifications, comparable to the ratios that comprise the public school membership of the BCCT. According to the BC Ministry of Education (Information Department, 2004), teachers comprise 91.70% of certificate of qualification holders in the public system and

---

[2] The BCCT membership year in 2004/2005 ran from September 1st to June 30th. 2004/2005 was a transition year; prior to that year, membership ran from September 1st to August 31st, annually. In 2005, the year changed to run from July 1st to June 30th, annually.

administrators comprises 8.30% of the population (Appendix D). In the selected sample, teachers comprise 94.52% (328) of certificate holders in the district and administrators comprise 5.48% (19). Although it mirrors the provincial population, the district is a convenience rather than a representative sample because not all members of the target population had an opportunity to be selected. The sample selection was determined by the sampling frame and accessibility (i.e., the district granted permission for its employees to be surveyed). There are no privacy issues concerning this portion of the sampling process.

The school district's employee database supplied an employment classification and either a school or home address for each member of the sample. Wherever possible, each person was contacted at their school address; home addresses were only be used in 27 cases (District Technology Manager, personal communication, April 13, 2005) where no school or district office address existed for the individual (e.g., individuals on long-term disability). All contact with the sample members was made through a research assistant contracted to prepare the distribution packages and deliver them. The research assistant for this project was the District Technology Manager employed by the school district. The researcher had no access to the names or contact information for any member of the sample to ensure confidentiality and anonymity for the participants and the data.

The accuracy of address information in provincial school district records is high resulting in a superior quality of the sampling frame and selected sample as far as locating subjects is concerned. The accuracy of employment classification is also very good however, for purposes of corroboration, the respondents' employment classification was requested on the questionnaire.

*Sample Size*

The "size of sample is less important than whether or not it accurately represents the population" (Neuman, 2003, p. 217). Even though the sample used is one of convenience, its composition closely reflects the teacher and administrator proportions within the target population. The total BCCT population is 64,922 members; those employed in the public school system total 36,831 (BC Ministry of Education, 2004) and represent 56.73% of the total BCCT membership. Therefore, this group also represents the largest employment category within the BCCT. The remainder is made up of members employed in independent schools, related employment (e.g., private tutors), other fields or professionals, or who are retired.

A confidence level of 95% is standard in survey research and was the minimum level considered for this project. A confidence interval between 5 and 10% is desirable and, assuming the standard 50% return rate typically used for calculations, a confidence interval of 7.5% would require return of 171 surveys and an initial distribution of 341 surveys, which is effectively equivalent to the school district's population of 347 BCCT members. Various calculations of sample size are provided in Table 1, Appendix E. The calculations and table provided are for a simple random sample and provide an estimate of the numbers involved.

*Data Collection*

Due to its inaugural, foundational, and heuristic nature, the project question necessitated quantitative research. A self-administered, mail-out questionnaire distributed to a convenience sample (see above) was determined to be an appropriate measurement instrument. A mail survey was selected over an e-mail or online survey in order to avoid biasing the results through representational error. That is, it is likely that only individuals who are comfortable with and regularly use computer-mediated communications (CMC) would be inclined to respond to an

electronic survey. A mail survey allows complete coverage of the sample and can be answered by both individuals who do and those who do not use CMC.

Many sources list the most significant problems with – or limitations of – mail surveys as low response rates and incomplete address lists (Cui, 2003; Neumann, 2003; Waksberg, 1997). Fortunately, the address records at the selected school district were 100% accurate (District Technology Manager, personal communication, March 31, 2005). The response rate issue needed meticulous attention, however. "Low response rate does more damage in rendering a survey's results questionable than a small sample" (Waksberg, p. 10). As a result, significant effort was focused on reducing this tendency.

Cui (2003) cites the work of Heberlein & Baumgartner in 1978 and Goyder in 1982, which identify ten variables that affect response rate (Appendix F). Repeat contacts, topic salience, use of incentives, and questionnaire length are variables that were considered in the questionnaire and data collection design. Cui also highlights the findings of Fox, Crask, and Kim in 1988 and Armstrong and Luske in 1987 that show that attention to pre-notification and postage issues (first-class versus second-class and bulk on mail-outs and return envelopes) is warranted.

Cui (2003) reports that in 1978 (revised in 1991) Dillman developed a comprehensive system – based in social exchange theory – designed to achieve higher response rates for mail surveys: Total Design Method (TDM). It is based on the premise that "questionnaire recipients are most likely to respond if they expect that the perceived benefits of responding will outweigh the perceived costs of responding" (Cui, The Total Design Method for improving return rates section, ¶1). TDM is outlined in Appendix G. Using TDM, the response rates of surveys of the

general public reach 50 – 70%; for more homogenous, educated groups (such as the BCCT), the

rate is 60 – 80% (Dillman, as cited in Cui).

TDM was applied in the design of the data collection in this research project and included

the following steps (see Appendix H for full details):

1. Design questionnaire.
2. Pre-test questionnaire.
3. Adjust and/or modify questionnaire.
4. Pre-test again, if necessary
5. Supply notification of upcoming survey to sample.
6. Distribute initial cover letter, consent form, and questionnaire.
7. Send follow-up letter, consent form, and replacement questionnaire to non-respondents (three weeks after first distribution).
8. Send final follow-up letter, consent form, and replacement questionnaire to non-respondents (five weeks after first distribution).
9. Tabulate results and analyze.
10. Send thank you cards to respondents

Pre-testing, using a combined approach that employed small focus groups and respondent

debriefings, was used to reduce measurement errors. In this study, only one round of pre-testing

was required as the results from the first testing revealed that few modifications were necessary.

Survey distribution was achieved through an internal mail system within the district,

which eliminated the opportunity to send the final distribution by express post or special delivery

but also reduced postage costs for the project significantly. The internal system also was reliable

and regular in its pick-up and delivery of mailings to and from the sample.

Ten days prior to the initial distribution of the survey, notification – in the form of an

announcement card – was distributed to each member of the sample (Appendix I). Although

similar, each of the three cover letters was written specifically for the survey distribution with

which it was sent. The first letter (Appendix J) outlined the significance of the research project,

the identity of the researcher and university, the time required to participate, and the voluntary

nature of participation. The second letter (Appendix K), sent to those who had not responded

within three weeks of the first distribution, contained another consent form and questionnaire and

requested the individual complete the survey and return it to the District Technology Manager if

they have not already done so (some surveys may have crossed paths in the distribution system).

The third letter (Appendix L), included a final copy of the consent form and questionnaire, confirmed the confidentiality and anonymity of any response returned to the researcher through the District Technology Manager, and gave instructions for those not wishing to participate or those having already returned a response that crossed paths with the final distribution. The same consent form and questionnaire were sent in each distribution to ensure consistency. To assist in record keeping and to ensure that duplicate responses were not received from individual sample members, each individual was assigned a code number, the details of which are discussed in the next section.

## *Questionnaire*

A copy of the survey, which consisted of close-ended questions at the nominal, ordinal, and interval level is supplied in Appendix C. Reliability and validity are addressed through the use of measures that query the same issue or concept in different ways. Contingency questions were not employed, although options of "don't know" or "neither agree nor disagree" (quasi-filters) were used.

Each member of the sample received the same questionnaire, but each questionnaire was coded prior to distribution according to the member's employment classification. A unique ordinal number comprised the code on the questionnaire so that follow-up with non-respondents was possible during the process. The ordinal number did not bare any numerical relationship to the individual's personal or employment information and records of the list of ordinal numbers and corresponding identification were kept separately so that non-responding individuals could be contacted to follow-up in their progress toward completing the questionnaire. Individuals who completed and returned the questionnaires were not contacted again until thank you notes were

sent out to all survey respondents. The code did not appear on any mailing labels, but did appear on the distribution list used by the research assistant.

Once the coded questionnaires were prepared, the assistant addressed a letter and envelope to the school or home address of each member of the sample, enclosed the introductory letter and survey in the envelope and delivered the package through the school district's internal mail system. This is the first instance in which privacy had to be addressed. The researcher was not involved in the preparation and printing of the letters and address labels, nor did she have access to the distribution list, names, or contact information for the members of the sample; these responsibilities were carried out by the District Technology Manager to ensure confidentiality and anonymity of the sample members.

## *Limitations*

Survey research by a mail-out, self-administered questionnaire is limited in a number of ways. Although the actual conduct of the questioning does not involve the researcher, unlike the more time-consuming interview survey (telephone or face-to-face), data from mail surveys takes longer to collect than data from telephone surveys in the long run because of the time spent waiting for responses to be returned. Mail surveys are not appropriate for open-ended questions because follow-up questions or clarifications are not possible. Probing questions are also not possible through this survey method. These qualitative types of questions must remain reserved for future research; it is suggested that this quantitative study will indicate areas into which more qualitative questioning is necessary. As already discussed, low response rates are a common problem with mail surveys. This issue was addressed as practically and thoroughly as possible using TDM (Appendices G and H).

Other limitations have been discussed elsewhere. Inaccuracies in the address list are uncharacteristically low, at 0%. Errors in employment classification are slightly higher than those of address records, but a question on the questionnaire confirming employment classification was included to address this problem. Finally, the results and findings are applicable to the population of this project only; they cannot be projected onto other groups or the general public.

## Findings

The survey consisted of thirty-three questions, of which four contain subsections. Thirty-two of the questions – including those with subsections – fall at the nominal and ordinal levels. One question measures at the interval scale level. Results are reported using univariate and bivariate descriptive statistics.

A total of 178 surveys were returned, representing a 51.30% rate-of-return. 21 returned surveys were not completed, resulting in an adjusted rate-of-return of 45.24%. The age distribution of respondents is consistent with the age distribution of the public school educator target population (Ministry of Education Analysis and Reporting, 2004) with 72% falling between 41 and 60 years old, 23.6% aged between 21 and 40, and 4.5% older than 61 (Appendix M).

### *Relative Frequencies and Distributions*

*Technology.*

Comfort levels with the use of computer technology and the Internet are high. 84.6% of respondents either *agree* or *strongly agree* that they are comfortable using the Internet while only 1.2% *disagree* or *strongly disagree* (Figure 1, Appendix N). These results are supported by results of other questions in which 91.1% of respondents report that they are comfortable and

only 8.9% indicate discomfort using computer technology, 97.5% indicate they own a computer, and 98.1% indicate having access to the Internet (Table 1, Appendix N). Measures of respondents' use of the Internet reflects the reported access and comfort levels; 50.0% of respondents use the Internet nine times or more per week, with a mean of 10.62 (Table 2 & Figure 2, Appendix N). The distribution indicates a wide range of usage, with most people (22.7%) using the Internet 20 times or more per week.

*Content.*

Respondents use websites to access information more than any other reason: 93.6% indicate they do so ranging from *sometimes* to *always* and 73.9% reply they do or would participate in virtual communities to find information about topics of interest (Tables 1 & 2, Appendix O). Quality of information is considered more important than quantity of information (95.6% versus 62.2%) but both are appreciated. Both up-to-date and quality information have more focussed dispersions located at the agreement end of the scale than quantity of information (Figures 1 – 3, Appendix O).

Ease of use is the agreed upon factor of content that influences website use (94.9%). Opinions about scrolling are not as strong or focussed (Figure 4 & 5, Appendix O). Attitudes about the significance of the visual appeal of websites and the use of graphics and photos on them are similar, with only a slightly higher number agreeing that visual appeal is important (Figures 6 & 7, Appendix O).

Online advertising is not well received: 80.2% *strongly agree* or *agree* that they dislike advertising on websites. This attitude is reflected in the number of respondents for whom free offers and online coupons are not important, 73.9%, and the low number prepared to participate in virtual communities to receive discounts or coupons on merchandise or services (Tables 3 &

4, Appendix O). However, respondents favour links to related sites; 86.0% believe related links should be provided. Responses are highly clustered at the agreement end of the scale with no one disagreeing (Figure 8, Appendix O). The broadest response range was found in support for e-mail notification when information on a visited site is updated (Figure 9, Appendix O).

Despite indicating that they do or would participate in virtual communities to obtain information about a topic of interest (Table 2, Appendix O), few respondents currently participate in virtual communities. 60.6% spend no time participating in virtual communities and another 21.9% indicate less than two hours of participation per week. Willingness to participate in virtual communities is also low, with 83.7% prepared to spend only two hours or less taking part per week. 49.7% are not prepared to spend any time participating in virtual communities. Respondents are prepared to participate in virtual communities only slightly more than they already do (Table 5, Appendix O). The high frequencies within the categories of *don't know* in each of two inquiries about virtual community usefulness and interest-value (35.3% and 31.8% respectively) suggest that the number of respondents who have visited a virtual community is relatively low (Table 6, Appendix O). When results from the *neither agree nor disagree* categories in each question – 26.3% and 28.7% correspondingly – are combined with each of the *don't know* results, the significance of these neutral classes cannot be ignored.

*Social Interactions.*

While 74.0% of respondents indicate at least some use of the Internet to interact with others (Figure 1, Appendix P), 83.2% indicate that they do not use the Internet to meet new people. This is supported by the 60.0% who do not post questions on the Internet and the 22.6% who seldom do. A similar number, totaling 82.4%, *never* or *seldom* answer question posted on the Internet. Participation with those having similar interests is slightly more frequent, but non-

and minimal participation rates remain high at 58.3% and 18.6% respectively. Inactive participation, or lurking, is practiced more often than active participation; 39.7% of respondents do so at least *sometimes* or more (Table 1, Appendix P).

64.3% indicate a preference for communicating either face-to-face or by telephone and 31.2% indicate that they don't trust people online (Table 2, Appendix P). The level of trust for online interactions despite an absence of the verbal and nonverbal communication believed integral to building both trust and social capital in face-to-face and telephone interactions is notable.

Most respondents (68.8%) are not prepared to participate in virtual communities in order to interact with people having common interests. This finding is echoed by the 58.3% who never interact online with those having similar interests (Table 1, Appendix P). This diverges from the 73.9% prepared to participate in virtual communities to find information about a topic of interest (*Content*, p. 35). Similar results were found concerning participation and membership in a community of practice (CoP); 65.6% of respondents indicate they would not participate in a virtual community for these reasons. This is an interesting result when a majority looks to the Internet for information, of which CoPs have been found to provide a wealth, yet only 34.4% would join a CoP that meets on the Internet. These results are consistent, however, with the likelihood of respondents to share personal information or expertise within a virtual community, 65.6% would not.

Similar to the results already reported for posting and answering questions on other Internet sites, a majority would not participate in either activity within a virtual community (Table 3, Appendix P). The least frequent reason for participating in a virtual community, at 3.2%, is to meet new people. This is considerably lower than the 16.8% using other Internet sites

for the same reason. Passive participation (lurking) is a reason to participate in virtual communities for only 25.5% of respondents, which is considerably lower than the 61.5% prepared to lurk (at varying degrees) on other Internet sites (Tables 3 & 1, Appendix P).

*Outside Influences.*

Two types of outside influences that draw people away from participating in virtual communities are considered, those posed by other Internet activities and those presented by non-Internet activities. Intrinsic to the discussion of outside influences is the factor of time. Educators, like most people, are busy not only in their professional but also in their personal lives. With a limited amount of time, each must determine the activities and responsibilities that will have priority. Each schedule is unique, however the homogeneous nature of the population results in more common activities than might develop within a more heterogeneous group and trends in the use of time are observable.

By far, the most influential factor on the Internet is the use of e-mail. Only 2.5% of respondents never use e-mail and over three-quarters (77.7%) use e-mail more than 9 times per month. E-mail is the only Internet influence that demonstrates a wide range of answers with most clustered at the upper end of the measurement scale (over 16 times per month). The lowest and highest categories (0 times per month and more than 16 times per month) represent the lowest and highest frequencies (respectively). The remaining cases are distributed relatively evenly across the four central values with three of the choices (5-8, 9-12, and 13-16 times per month) accumulating 10.8% each (Figure 1, Appendix Q).

Use of conventional Internet sites is the next largest draw on participation in virtual communities with 42.2% visiting them more than 9 times per month (Table 1, Appendix Q). Blog and chat activities were the least practiced, with many respondents never participating in

them (81.3% and 84.7% respectively). Very few participate above the two categories of lowest use (Figures 2 & 3, Appendix Q). Although used more than blogs and chat, levels of e-commerce activity reflect both low participation and, for those who do, few sessions each month (Figure 4, Appendix Q). 48.1% use online databases 1 to 4 times a month followed closely by the 35.3% who did not use them at all (Table 2, Appendix Q). Although a majority does not use asynchronous discussion, the number of sessions per month among the 40.8% who do ranges widely with 21.4% using it more than 9 times per month (Figure 5, Appendix Q).

Outside influences from non-Internet sources consume much more time than Internet influences. In most cases, time spent at work is high and can be inferred to influence participation levels in other activities, including virtual communities. More than 90% of respondents work 20.0 hours per week or more with 54.2% working more than 40 hours per week. This is in addition to other work-related activities in which 82.6% of respondents participate (Table 3, Appendix Q). With a week consisting of between 112 and 140 waking hours (based on 4 to 8 hours of sleep per night), work and work-related activities consume a significant portion of the time available to participate in other activities such as virtual communities.

Only 0.6% of respondents indicate no participation in family-related activities and there is no significant predominance amongst the remaining choices. The range of the frequencies is wide and relatively evenly distributed (Figure 6, Appendix Q). Participation in family-related activities affects virtually every respondent. Participation in house- and yard-work activities is strongly clustered around 5.1-10.0 hours. Only 1.9% of cases indicate no participation in this factor so it too impacts on almost every respondent although for many at a lower rate than family-related activities (Figure 7, Appendix Q).

The remaining activities exhibit much more variability within their distributions but all indicate that most individuals dedicate fewer hours to these activities (Figures 8-12, Appendix Q). The most frequently selected category for all of these variables is 0.1-5.0 hours. Spiritual activity is the only factor that has a significant number who do not practice the activity at all (43.2%). Most respondents indicate at least a low level of activity in each of the remaining factors. In ascending order they are: volunteer activities, personal education activities, social activities, and sports activities.

Only nine outside influences have been investigated. The sum of the average of the most frequently chosen category within each of these activities is 80.95 hours (Table 4, Appendix Q). This represents between 57.8% and 72.3% of waking hours. Time consumed by other regular activities such as eating, personal care, shopping, medical appointments, travel time (e.g., to and from work), waiting time (in line-ups, etc.), and other hobbies and activities has not even been considered. It can be deduced that the time that most educators have left to donate to new activities, such as participation in virtual communities, is limited and may be zero for some.

### *Measures of Association*

With sixty-three variables existing within the survey's thirty-three questions, two- and three-variable calculations examining the relationships between them are abundant. Only two-variable comparisons that relate closely to respondents' use of virtual communities are presented. Crosstabulations (contingency tables), scatterplots, and *Spearman rank-order* ($r_s$), *phi*, and *Kendall's tau-b* and *tau-c* correlation coefficients are employed

In most cases, statistically sound associations and relationships between variables were not evident. However some patterns did present themselves and may hint at the possibility of correlations in the early stages of development. In all cases, no relationship between either the

usefulness or the interest-value of virtual communities and any other variable exists. The

strongest correlations and associations presenting notable patterns are reported.

*Technology.*

The high levels of comfort with computer technology and the Internet discussed in the

previous section (*Relative Frequencies and Distributions*, p. 34) are confirmed with

crosstabulations. In general, regardless of employment classification and age, most educators are

comfortable with Internet and computer technologies. (Table 1 & Figure 1; Figure 2 & Table 2,

Appendix R).

E-mail use and access to (computer and Internet) technology are moderately related, with

phi coefficients falling just below 0.500. The number of respondents not having computer

technology access due to equipment or skills is quite low and those not owning computers or not

having Internet access fall almost exclusively among those using e-mail *never* or *seldom* (Figure

3, Appendix R).

As might be expected, e-mail use and frequency of its use per month are quite strongly

and positively correlated, $r_s = 0.714$ (Figure 4, Appendix R). The consistency between the results

on these variables also serves to validate the results. Variables measuring monthly use of other

modes of CMC are all positively related to e-mail use however the strengths of the relationships

are not particularly strong (Table 3, Appendix R). E-mail use does not predict use of other types

of CMC, including virtual communities.

*Content.*

While a correlation between use of the Internet to access information and use of virtual

communities is not exhibited, the relationship between use of virtual communities to access

information and frequency of use of virtual communities is approaching a moderate level of

correlation. Figure 1, Appendix S shows that all those participating in virtual communities more than 2.0 hours per week access information about topics of interest there. A majority of respondents (57.7%) indicate that they use or would use virtual communities to find information about a topic of interest *frequently* or *always* (Table 1, Appendix S), however the currently low participation rate in virtual communities does not reflect this commitment.

Only one other appreciable content relationship exists. There is a strong, positive relationship between the importance of visual appeal and the importance of graphics and photos on websites, which suggests that visually appealing sites are those that include graphics and images (Figure 2, Appendix S). Whether this is for aesthetic reasons, information purposes, or a combination of both is not clear and suggests that further research into the importance of visual representations on websites and within virtual communities is needed.

*Social Interactions.*

An interesting pattern emerges when associations between use of the Internet to interact with those having similar interests and participation in virtual communities for similar reasons are considered (Figures 1-3, Appendix T). Within the two highest frequencies of online interactions with others (*frequent* and *always*), participation in virtual communities to interact with people having common interests, to partake in a CoP, and to share information or expertise happens more often than not. This is a pronounced shift in participation and suggests that those using the Internet the most to interact with others having similar interests are also socially interacting within virtual communities to share information.

Table 1, Appendix T shows that the strongest relationship exists between interest-value and participation in virtual CoPs (phi = 0.485) followed by participation in virtual communities to observe without active participation (lurking) and to interact with those sharing common

interests (phi = 0.428 & 0.427, respectively). Coefficients for interest-value and sharing information and expertise, asking questions, and answering questions were all clustered slightly below interactions related to CoPs and common interests (phi = 0.397, 0.396, 0.371, respectively). It is noted that the number that would participate in virtual communities solely for social interaction reasons is low. Within each variable mentioned, the portion prepared to socially interact is less than 36% of the sample (Table 1, Appendix T).

The association between current participation rates in virtual communities and social interactions were slightly lower than those for virtual community interest-value and social interactions. The three highest social interaction activities were asking questions, participation in a CoP, and sharing information or expertise, with 35.5%, 34.8%, and 34.2% (respectively) of respondents indicating using virtual communities for these social interactions. Answering questions and non-active participation (lurking) had equivalent participation rates, though lower than other social interaction activities, at 25.2% (Table 2, Appendix T). Willingness to participate more in virtual communities was not strongly influenced by social interactions although asking and answering questions did exhibit a relatively strong relationship (phi = 0.534 and 0.505, respectively) with willingness to increase participation (Table 3, Appendix T). This stronger relationship exists even though the number that would undertake these activities remains close to the levels of those currently participating in virtual communities (35.3% and 24.8%, respectively).

*Outside Influences.*

Although correlations are currently weak, an interesting pattern in the relationship between usefulness of virtual communities and non-use of virtual communities due to other interests and hobbies is present. Within the *agree* and *strongly agree* categories of virtual

community usefulness a majority indicate that they do *not* have other interests and hobbies to which they dedicate their free time, while in all other usefulness categories the largest numbers represent  those who *do* have other interests and hobbies to occupy their time (Table 1, Appendix U).

The results are similar for the interest-value measure of virtual communities compared to time spent on other non-Internet activities. In this case, the category indicating the highest level of agreement with the interest-value of virtual communities has a majority (100.0%) indicating that they do not have other interests and hobbies that demand their time. In the next highest category of agreement (*agree*), the number indicating they do not have other activities demanding their time – 50% – is equivalent to the number indicating that they do (Table 2, Appendix U).

Other associations between outside influences and use of virtual communities, while evident, are not statistically sound. Further research focusing on the relationship (if any) between outside influences and participation in virtual communities is warranted.

## Discussion

### *Rate-of-Return*

The rate-of-return of this survey, although not quite 50%, is impressive because a mail survey achieving a 20% rate of return is typically considered quite successful. The high return rate is the result of several contributing factors, including the homogenous nature of the sample, the high accuracy of the contact information within the school district database, and the consistent contact provided through the employment of the Total Design Method (TDM). The number of returned surveys was consistent between the first and second distributions and only

fell after the third distribution. Had there been only one distribution without follow-up, it is unlikely that the rate of return would have reached the same level.

Thus, the return rates for this study support the use of TDM, or a variation of it, to improve rates of return for mail-out surveys. By reducing the cost of participation for respondents (the survey took about ten minutes to complete and was easy to complete), increasing the rewards of participation (providing a definition and examples of virtual communities and a variety of question styles), using official logos, professional layouts, and quality printing to increase trust, and employing multiple-contacts (including pre-notification, follow-up contact with non-respondents, and thank you cards) the typical return rate for mail-out surveys can be improved.

## *Findings*

The results suggest that the viability of the BCCT creating a successful virtual community at this time is not good. Across all age and employment classifications, educators have access to computer technology and the Internet and are comfortable using both. The numbers in the technology factor were higher than expected. It appears that critical mass within this area has been reached and lack of access to or skills using computer technology and the Internet are not reasons that educators would not visit a virtual community.

The range of computer-mediated communications (CMCs) in which participation occurs is limited. E-mail and non-community websites, the traditional modes, are the most widely used and accepted. While this suggests a tendency toward acceptance and use of virtual communities, only early adopters are participating in them at this time with the majority of educators not yet aware of and/or comfortable with this CMC. Educators are least likely to use highly interactive forms of CMC, such as chat, blogs, e-commerce, asynchronous discussion, and virtual

communities. These forms have not proven useful or interesting for this group. Perhaps educators are not familiar with these forms of technology due to lack of experience using them. Indeed, it may be that even after reading the definition provided in the questionnaire, some individuals still have a poor understanding of the virtual community concept because they have never visited one. Further research into reasons educators do not widely use CMCs requiring active participation is warranted.

The use of e-mail does not predict the use of other modes of CMC and, thus, one cannot conclude that educators' adoption of e-mail communication foreshadows their use of virtual communities (although it does not discredit it either). With few educators venturing outside the realms of e-mail and traditional static websites, engagement of individuals to participate in a virtual community may prove challenging. Not many years ago, however, educators were reluctant to use e-mail just as they are reluctant to use interactive modes of CMC today. It is possible that virtual communities will also become a useful form of CMC for this group in the future.

By far, the most popular content for educators is information about topics of interest (including work). Although quantity of information is important, the quality and currency of information is more critical. Ease of use of websites, visual appeal, and graphic and image use are also important content factors for this group. Further research into site infrastructures that this group prefers is needed. For example, the strong relationship between visual appeal and the importance of graphics and photos is not surprising, but the importance of visual features on websites and their information value cannot be overlooked. Visual representations, including graphics, tables and charts, photos, drawings, and images, often provide a high-level of information in a small space (space that is often valuable real-estate on a website), as well as

aesthetic appeal. Further investigation into the types of visual representations that educators find most useful and appealing would be beneficial. However, whether for aesthetic or practical (information) reasons, it is safe to say that if a virtual community is developed by the BCCT it should include colour, strong layout (which contributes to ease of use and readability), graphics providing succinct information, and informative images to engage and sustain membership in the community.

Advertising is unappreciated by this group. The BCCT would be well advised to avoid its use within a virtual community although links to related sites are acceptable to educators. The BCCT may wish to investigate the possibility of raising revenues through "click through" commissions from associated sites if a virtual community becomes well established (e.g., bookstores such as Amazon.ca and Chapters.Indigo.ca regularly pay fees to sites that feature links to their products and services). That is, once a critical mass of members is engaged and using the BCCT community and the strong ties of SNT and organizational identification theory have been established between the organization and its members, adding links of a more commercial, yet informative, nature may be worth examining. The network thus produced may be valuable to all its members.

Despite the group's reported pursuit of information, the use of virtual communities remains relatively low. Educators do not appear to consider the process of accessing information on the Internet as a series of social interactions. Unfamiliarity with virtual communities (no experience using them) may explain this. The few who do have high participation rates in virtual communities also report higher rates of participating in virtual communities to access information. These statistics reflect the familiarity and trust that these users have gained concerning virtual communities. They have developed social capital and strong ties (SNT) that

lead them to develop identification with the community – as described in organizational identification theory – and, thus, to go there for information (as well as other) purposes. It is the social ties (both weak and strong) of SNT that engage them in the community, social capital (including a sense of trust) develops and, finally, identification with the community occurs (organizational identification theory). Throughout this process the sharing (give and take) that occurs within the interactions is critical.

Social interaction is the weakest reason for educators to use the Internet. Despite high levels of comfort with and use of the Internet, the main activities are focussed on e-mail and accessing information. Use of the Internet for social and professional interaction is relatively weak and trust of others online is low. Many report preferring face-to-face or telephone communication over virtual communities. While some report interacting online, very few do so in order to meet new people. Even those who participate in virtual communities do not do so to meet new people. According to SNT, interactions with new people constitute the basis for the development of both the weak and strong ties within a social network; weak ties, in particular, are often formed as the result of interactions with new people.

Social interactions that do occur are concentrated to those between people having common interests, although the commitment to participate in virtual communities in order to interact with those having common interests is low. Within all forms of social interaction (asking or answering questions, meeting new people, sharing information with others, etc.), educators are more prepared to use any other type of CMC than to participate in virtual communities. Respondents are more interested in interactions to access information than to create social ties and are more interested in gaining information than in sharing it. It seems this group does not consider gaining access to information as an "interaction", social or otherwise. Although social

interaction is not a significant reason for use of the Internet (or virtual communities) at this time, the beginning of movement toward critical mass in this area is evident in weak associations between use of the Internet to interact with those having similar interests and use of virtual communities for the same reason, use of virtual CoPs, and use of virtual communities to share information or expertise. With more time and experience with online social interactions educators may find the ties that they develop there beneficial. That is, as they become more familiar with the medium, they may begin to trust and value the social interactions and build the strong ties that underpin social capital (SNT). They may determine that the benefit of interacting in this new fashion outweighs any real or perceived costs (social exchange theory).

Along with the lack of determination to have social interactions on the Internet, outside influences significantly limit educators' participation in virtual communities. Social exchange theory figures prominently in consideration of these influences as the costs and benefits of participation in activities are constantly being weighed. Competing modes of CMC with which educators are more familiar make the cost of using new technologies higher than any perceived benefits. More dominant than competing forms of CMC, however, are non-Internet outside influences that consume much higher proportions of educators' time. In particular, work, work-related, family-related, and house- and yard-work activities impact on almost every member of the group and consume large amounts of time. For most, the benefits of participating in a virtual community do not yet outweigh the costs associated with sacrificing some of these activities. However, those indicating lower levels of outside activities *do* spend more time participating in virtual communities. This suggests that given the time, educators will participate in virtual communities. Right now, the discrepancy between the costs and benefits of participation in virtual communities is too high for most.

While the BCCT cannot affect educators' life situations, it may be able to create a virtual community in which the benefits of participation prevail over the benefits of using other forms of CMC and may secure some of the time that educators currently donate to e-mail and non-community websites. As predicted by social exchange theory, if educators feel the benefits of using virtual communities outweigh those of using e-mail and other websites, their participation within them will increase. In order to determine the benefits, educators must become familiar with virtual communities. They must become engaged so that development of the weak and strong ties that underpin the social networks of SNT is possible. This network of ties leads to the development of social capital. If educators regard the ties and social capital as beneficial, critical mass (for survival of the community) will be achieved and the identity-identification duality described in organizational identification theory will develop between the educators and the BCCT. The second goal of the BCCT strategic plan (improved communication) will be achieved with its membership and the identity of both the BCCT and each of its members will change. If positive reinforcement prevails, the relationship will strengthen and grow and will do so not at the direction of the BCCT organization but at the direction of the community of educators it simply houses.

To institute *any* CMC successfully, the BCCT must ensure that the conditions described by social exchange theory are addressed – that the costs are not higher than the benefits of using the selected technology – so that the first phase of engagement thrives and leads to the critical issues of SNT – the bridging and bonding ties created through social interactions – to facilitate the second phase of implementation. Once a strong social network is developed, the third phase of identification described in organizational identification theory will be achievable and

communication will flourish. For example, implementation of an internal intranet within the BCCT office should anticipate the same challenges (see below).

- Phase One: For employees, the benefits of using the intranet must prevail over the costs of not using it so that engagement ensures a critical mass of employees participate (e.g., content, ease of use, and social interactions must be positive for employees);

- Phase Two: Once engagement and critical mass are achieved, social interactions must produce both strong and weak ties between individual employees and departments to create a social network within the system that develops trust and social capital; and,

- Phase Three: Through engagement, critical mass, social ties, and social capital, the employees identify with the intranet community and adjust their identification with the BCCT. In return, the identify of the BCCT changes as well, at least internally and possibly externally since improved internal communication is often reflected in communication with external partners.

In general, a lack of understanding about or experience using virtual communities as well as competing activities (both Internet-based and external) indicate that the use of a virtual community as a communication avenue between the BCCT and its members is not feasible at this time because its survival is unlikely. Because social exchange theory costs overshadow the benefits, a virtual community will not achieve its purpose because it will not meet the basic requirement described by Cothrel & Williams (1999) to "engage and involve members" (What is an on-line community, and what makes one successful section, ¶3). Without success in the first stage of (virtual) community development, the identity-identification duality of the second phase and organizational identification theory will not occur and, predictably, no bonding and bridging

ties will exist to form the social network of SNT. Without identify-identification duality, the communication between the BCCT and its members will remain unchanged. The second strategic goal of the BCCT (improved communications with members and others) will not be satisfied even though the goal (upgraded technology) will have been pursued. However, with further educator use of interactive Internet technologies, including other virtual communities, the critical mass for participation in and successful growth and endurance of a virtual community may be reached in the future. At the moment, the cost of using virtual communities prevails over it benefits in the minds of educators.

*If We Build It, Will They Come?* At the moment, no, they will not. But as educators use and experiment with Internet technology, and early adopters spread word of the benefits of virtual communities, their appeal may grow. The BCCT must continue to monitor educators' use of Internet technologies to watch for increases in their use of virtual communities and other CMCs. In doing so, the BCCT will create channels over which to facilitate the identity-identification duality (organizational identification theory) and the positional and relational social networking (SNT) that it hopes to achieve with its membership. The virtual community concept should not be abandoned because the benefits for the BCCT to develop a virtual gathering place may soon overshadow the costs. Ethical influence of the social network and organizational identification it hopes to develop with its members may be attainable and survival and growth of the community will be achievable.

## Other Considerations

It must be noted that not all considerations could be addressed within this study. No consideration has been given to the political environment in which the BCCT exists. The

environment is changeable and the impact of this factor must be considered when examining the viability of a virtual community supported by the BCCT.

Another issue is the challenge of monitoring educators' use of Internet technologies and CMC. Return rates for previous surveys distributed by the BCCT have been low. The most recent – in April 2005 – had an insufficient return rate that did not allow for any reliable conclusions to be drawn. Such low rates-of-return are not useful in making organizational and planning decisions.

The factor of outside influences is a broad one; this survey touches only on those areas the researcher determined may have the most impact on educators' use of virtual communities. As already pointed out, many daily and routine activities have not been considered and may prove to have significant impact on educators' use of virtual communities. Equally important, but not considered here, is the effect of stress and other psychological factors (such are information overload) that may affect educators' use of virtual communities.

The critical nature of leadership within the community is not discussed or investigated here. To ensure success, a few key members of the BCCT must be prepared to volunteer to stimulate discussion and activities within the community. As well, somebody or bodies (other than the BCCT) must be prepared to police the interactions and postings that occur, to assure the development of trust and social capital. The BCCT must be cautious to ensure these leaders are willing and present. Ideally, leaders should emerge from the community the BCCT supports not from the BCCT itself. The study has not investigated educators' willingness to take on leadership roles within virtual communities and this will be a critical issue if a virtual community is launched by the BCCT.

Even given a state in which the conditions for success of a virtual community – as suggested in this paper – may be present, it is possible that the launch of a virtual community by the BCCT may be unsuccessful for reasons outside of those considered here. However, this study has begun to examine many of the critical issues that must be considered in relation to a virtual community: participants must have access to and be comfortable with Internet technology; they must be satisfied that the content and interactions within the community are useful and interesting; they must feel they belong to the community – that strong and weak social ties exist between themselves and other members – and that they identify with the community; and, they must believe that the benefits of participating in the community outweigh any costs (that is, they must feel the social interactions and content are more valuable than costly). Once these conditions have been met, the participants are engaged, active, and part of the social network within the community. Social capital is evident and identity-identification duality exists: the participants identify with the community (and the BCCT) and, in turn, change the identity of the community (and, thus, the BCCT). It is a symbiotic relationship that continues for the life of the community. It strengthens the identity of individual education professionals, the BCCT, and the professional as a whole, within both the community itself as well as the larger societal community.

# References

Abdelmour Nocera, J.N. (2002). Ethnography and hermeneutics in cybercultural research accessing IRC virtual communities. *Journal of Computer-Mediated Communication, 7*(2). Retrieved on January 31, 2004 from http://www.ascusc.org/jcmc/vol7/issue2/nocera.html

Anderson, T. & Kanuka, H. (1997). On-line forums: New  platforms for professional development and group collaboration. *Journal of Computer-Mediated Communication, 3*(3). Retrieved on January 29, 2004 from http://www.ascusc.org/jcmc/vol3/issue3/anderson.html

BC Ministry of Education, Analysis and Reporting (2004). *Average teacher/administrator age*. Retrieved June 20, 2005 from http://www.bced.gov.bc.ca/reporting/levels/prov_key4.htm

BC Ministry of Education, Information Department. (2004). *Educator report 2000/01 – 2004/05: Provincial* (2004/DEC/31). Retrieved on March 30, 2005 from http://www.bced.gov.bc.ca/reporting/enrol/results/teacher/prov.pdf

Beebe, S. A. & Masterson, J. T. (2003). *Communicating in small groups*. Boston, MA: Allyn and Bacon.

British Columbia College of Teachers. Council sets out blueprint for 2003-2004. *Professional Focus, 1*(1), 4.

Contractor, N. & Monge, P. (2002). Managing knowledge networks. *Management Communications Quarterly, 16*, 249-258.

Cothrel, J. & Williams, R. L. (1999). On-line communities: Helping them form and grow. *Journal of Knowledge Management, 3*(1), 54--60.

Cui, W. W. (2003). Reducing error in mail surveys. *Practical Assessment, Research & Evaluation, 8*(18). Retrieved on March 15, 2004 from http://pareonline.net/getvn.asp?v=8&n=18

Dunn, W. (1983). Social network theory. *Knowledge, 4*, 453-461.

Figallo, C. (1998). *Internet world: Hosting web communities*. New York: John Wiley & Sons, Inc.

Garton, L., Haythornthwaite, C., & Wellman, B. (1997). Studying online social networks. *Journal of Computer-Mediated Communication, 3*(1). Retrieved on January 29, 2004 from http://www.ascusc.org/jcmc/vol3/issue1/garton.html

Granovetter, M. (1982). The strength of weak ties: A network theory revisited. In P. Marsden & N. Lin (Eds.), *Social structure and network analysis* (pp. 105-130). Beverley Hills, CA: SAGE Publications, Inc.

Hiltz, S.R. & Turoff, M. (1993). *The network nation: Human communication via computer*. Cambridge, MA: The MIT Press.

Jones, Q. (1997). Virtual-communities, virtual settlements & cyber-archaeology: A theoretical outline. *Journal of Computer-Mediated Communication, 3*(3). Retrieved on January 31, 2004 from http://www.ascusc.org/jcmc/vol3/issue3/jones.html

Kim, A. J. (2000). *Community building on the web: Secret strategies for successful online communities*. Berkeley, CA: Peachpit Press.

Kollock, P. (1996, May). *Design principles for online communities*. Paper presented at the Harvard Conference on the Internet and Society, Cambridge, MA. Retrieved on January 29, 2004 from http://www.sscnet.ucla.edu/soc/faculty/kollock/papers/design.htm

Kraut, R., Kiesler, S., Mukhopadhyay, T., Scherlis, W. & Patterson, W. (1998). Social impact of the Internet: What does it mean? *Communications of the ACM, 41*(12), 21-22.

Littlejohn, S.W. (2002). *Theories of human communication*. Belmont, CA: Wadsworth Group.

Markus, M.L. (1990). Toward a "critical mass" theory of interactive media. In J. Fulk & C. Steinfield (Eds.), *Organizations and Communication Technology* (pp194-218). Newbury Park, CA: SAGE Publications, Inc.

Millen, D. & Patterson, J. (2002, November). *Stimulating social engagement in a community network*. Paper presented at the ACM 2002 Conference on Computer Supported Work, New Orleans, LA.

Millen, D., Patterson, J., & Costanzo, C. (2001). *The dynamics of social interaction in a geography-based online community* (Technical Report #01-06). Cambridge, MA: IBM Watson Research Center.

Neuman, W.L. (2004). *Social research methods: Qualitative and quantitative approaches*. Boston: Allyn & Bacon.

Norris, P. (2002). The bridging and bonding role of online communities. *Press/Politics, 7*(3), 3-13.

Preece, J. (2000). *Online communities*. West Sussex, England: John Wiley & Sons, Ltd.

School Act, Part 3 Division 1 §19(1), (Revised Statutes of British Columbia [RSBC]1996). Retrieved on November 30, 2003 from http://www.bced.gov.bc.ca/legislation/schoollaw/revisedstatutescontents.pdf

Scott, J. (2000). *Social network theory: A handbook*. London: SAGE Publications Ltd.

Sempsey, J. & Johnston, D. (2000). The psychological dynamics and social climate of text-based virtual reality. *Journal of Virtual Environments, 5*(1). Retrieved on January 31, 2004 from http://www.brandeis.edu/pubs/jove/HTML/V5/sempseyjohnston.htm

Smith, M.A. & Kollock, P. (Eds.). (1999). *Communities in cyberspace.* London: Routledge.

Steinfield, C. (1992). Computer-mediated communications in organizational settings: Emerging conceptual frameworks and directions for research. *Management Communications Quarterly, 5*(3), 348-365.

Sullivan J.L., Borgida, E., Jackson, M.S., Riedel, E., Oxendine, A. & Gangl, A. (2002). Social capital and community electronic networks. *The American Behavioral Scientist, 45*, 868-886.

Teaching Profession Act, § 4 (RSBC 1996; updated May 2004). Retrieved on April 12, 2005 from http://www.bced.gov.bc.ca/legislation/schoollaw/teaching_profession_act_contents.pdf

Teaching Profession Act, § 19 (RSBC 1996; updated May 2004). Retrieved on April 12, 2005 from http://www.bced.gov.bc.ca/legislation/schoollaw/teaching_profession_act_contents.pdf

Tompkins, P. K. & Cheney, G. (1985). Communication and unobtrusive control in contemporary organizations. In R. McPhee & P. Tompkins (Eds.), *Organizational communication: Traditional themes and new directions* (pp. 179-210). Beverly Hills, CA: Sage Publications.

Waksberg, J. (1997). *How to collect survey data* (2nd ed.)[Brochure]. Alexandria, VA: American Statistical Association. Retrieved on March 15, 2004 from http://www.amstat.org/sections/srms/brochures/SurveyData.pdf

Wellman, B. & Gulia, M. (1999). Virtual communities as communities: Net surfers don't ride alone. In M.A. Smith & P. Kollock (Eds.), *Communities in Cyberspace* (pp. 167-194). New York: Routledge.

## Appendix A

### The 2003 – 2004 Strategic Plan of the British Columbia College of Teachers

1.  Establish standards for the education, professional responsibilities, and competence of its members, as set out in section 4 of the *Teaching Profession Act*, by April 2, 2004.

2.  Provide effective communication with members of the College, education partners, and the public.

3.  Improve the ability of the College to respond to information needs, both internally and externally, by enhancing the technological capabilities.

4.  Develop bylaws and policies for the receipt and effective disposition of person complaints and member reports under the *Teaching Profession Act*.

5.  Improve the disciplinary process.

6.  Develop in partnership with the Faculties/Schools of Education a process to replace the teacher education approval process set out in section 21 on the *Teaching Profession Act*.

7.  Improve the governance structure of the College.

8.  Ensure that the bylaws and policies are compatible with the *Teaching Profession Act* and the principles of institutional independence.

9.  Establish requirements for continuing education to maintain the standards of education, professional responsibilities, and competence of its members as established under section 4 of the *Teaching Professional Act*.

10. Ensure the long-term financial stability of the College, and

11. Develop policies to improve public consultation by including an opportunity for input to Council meetings.

# Appendix B

## Four Factors Affecting the Use of Virtual Communities

| Technology | Content |
|---|---|
| <ul><li>Access to technology</li><li>Skills to use technology</li><li>Speed of internet provider's system</li><li>Security</li><li>Synchronous discussions (chats)</li><li>Asynchronous discussions</li><li>Web cameras/video conferencing</li><li>E-mail</li><li>Interface design</li><li>Navigation design</li><li>Cost of internet service provider</li></ul> | <ul><li>Usefulness of community</li><li>Purpose of the community</li><li>Access to information</li><li>Discussion topics</li><li>Currency (regular updates)</li><li>Advertising</li><li>Public and private areas</li><li>Common interests</li><li>Common goals</li><li>New knowledge or information</li><li>New ideas</li><li>Share knowledge or expertise</li><li>Learn new skills, information, or knowledge</li><li>Exchange of experiences, stories, histories</li></ul> |
| **Social Interactions** | **Outside Influences** |
| <ul><li>Host of community</li><li>Active participation</li><li>Passive participation</li><li>New friends</li><li>Participation by others</li><li>Rules of community</li><li>Reminders to visit community (e-mail)</li><li>Continuity of community</li><li>Exclusivity (limited membership)</li><li>Comradeship</li><li>Networking</li></ul> | <ul><li>Work obligations</li><li>Family obligations</li><li>Social obligations</li><li>Volunteer obligations</li><li>Obligations related to work</li><li>Use of virtual communities by friends and family</li><li>Other hobbies</li><li>Time constraints</li><li>Opinions of colleagues, friends, family</li><li>Educational pursuits</li><li>Preference for face-to-face community interaction</li></ul> |

## Appendix C

## Survey Instrument – Definition of Virtual Community and Questionnaire

**Purpose of research project:**

**Research Opportunity**

UNIVERSITY OF
ALBERTA

*To determine factors that
influence professional educators'
participation in virtual communities.*

Virtual communities are online gathering places in which members or visitors interact to exchange and access information about common interests.

The following questionnaire asks for information about your use of computer-mediated communication (the Internet, e-mail, websites, chat rooms, etc.), and virtual, or online, communities. The researcher has not and will not have access to any of your personal information. The code number shown on this form is used for data classification purposes and to prevent survey responses being counted more than once.

**How you can help:**

Your cooperation and participation in completing this questionnaire is requested. Participation is voluntary. Participants may discontinue their participation at any time by choosing not to complete the questionnaire.

Please complete the consent statement below and return it and the questionnaire in the enclosed self-addressed envelope. We ask that you complete this portion of the form and return it even if you are not completing the questionnaire. Your contribution to this study is appreciated.

---

I have read and understand the purpose and nature of the research to be conducted.

Please check one only:

☐ I agree to participate in the research project through completion of the enclosed questionnaire.

☐ I do not agree to participate in the research project and will not be completing the enclosed questionnaire.

Signature: _____

Date: _____

---

Identification
Code

## What is a virtual community?

Many people believe a community is created when a group of people with a common interest, concern, and/or purpose meet and interact through chat, discussion, and information exchange about their shared interests. Usually, communities have a gathering place or places where people often meet to interact – a post office, coffee shop, shopping mall, park, community centre, formal or informal meetings, etc.

With the evolution of the Internet, people have begun to move away from the traditional notion of community being a physical place and are now gathering online. These online gathering places have become known as virtual communities. *The Well* (www.well.com), which began in 1985, is a notable example of a virtual community, but many more exist.

Virtual communities differ from traditional communities because members of the community may never meet face-to-face. Related to this is the fact that virtual communities can, and often do, bring together individuals separated by geographical distances that would otherwise prohibit their ever meeting or interacting.

The key to any community is the interaction between its members. It is through these activities that a sense of belonging develops. Without participation of its members (both passive and active), a community would fail to survive.

As you answer the questions in this survey, please keep this description of a virtual community in mind. Not all the questions address virtual communities, but when "virtual community" is mentioned, it is to this definition that we are referring.

### Examples of virtual communities

| | | |
|---|---|---|
| Petsburg | pet lovers | www.petsburg.com |
| Couchsurfing | frugal travellers | www.couchsurfing.com |
| Cyber Yugoslavia | former citizens | www.juga.com |
| EdGateway | educators | www.edgateway.net |
| ICERED | high-income earners (Asia) | www3.icered.com |
| Red Hat | software open code (Linux) | www.redhat.com |
| AllExperts | expert Q&A on numerous topics | www.allexperts.com |

Figure C1. A definition of virtual community was supplied within the survey instrument to familiarize those who had not participated in one with the concept.

**A.** For questions 1 through 9, please use the following scale:

A = always ST = sometimes S = seldom
F = frequently N = never

| | A | F | ST | S | N |
|---|---|---|---|---|---|
| 1. I use e-mail: | ❑ | ❑ | ❑ | ❑ | ❑ |
| 2. I post questions online: | ❑ | ❑ | ❑ | ❑ | ❑ |
| 3. I use the Internet to access information: | ❑ | ❑ | ❑ | ❑ | ❑ |
| 4. I use the Internet to interact with others: | ❑ | ❑ | ❑ | ❑ | ❑ |
| 5. I use the Internet to meet new people: | ❑ | ❑ | ❑ | ❑ | ❑ |
| 6. I use the Internet to post questions for others to answer: | ❑ | ❑ | ❑ | ❑ | ❑ |
| 7. I answer questions posted on the Internet: | ❑ | ❑ | ❑ | ❑ | ❑ |
| 8. I read online postings without commenting on them: | ❑ | ❑ | ❑ | ❑ | ❑ |
| 9. I interact online with those having interests similar to my own: | ❑ | ❑ | ❑ | ❑ | ❑ |

10. On average, I use the Internet this many times per week:

| | | | | | |
|---|---|---|---|---|---|
| ❑ 0 | ❑ 4 | ❑ 8 | ❑ 12 | ❑ 16 | ❑ 20 |
| ❑ 1 | ❑ 5 | ❑ 9 | ❑ 13 | ❑ 17 | ❑ more than 20 |
| ❑ 2 | ❑ 6 | ❑ 10 | ❑ 14 | ❑ 18 | |
| ❑ 3 | ❑ 7 | ❑ 11 | ❑ 15 | ❑ 19 | |

**B.** For the next section, please use the following scale:

SA = strongly agree D = disagree
A = agree SD = strongly disagree
A/D = neither agree or disagree
DK = don't know

| | SA | A | A/D | D | SD | DK |
|---|---|---|---|---|---|---|
| 10. I am comfortable using the Internet: | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| 11. I find virtual communities useful: | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |
| 12. I find virtual communities interesting: | ❑ | ❑ | ❑ | ❑ | ❑ | ❑ |

Identification
Code

C. These questions concern non-interactive websites, at which you cannot chat, discuss, or exchange information (although you may be able to send an e-mail to the website host). They are **NOT** virtual communities.

For these questions, please use the following scale:

**SA** = strongly agree          **D** = disagree
**A** = agree                    **SD** = strongly disagree
          **A/D** = neither agree or disagree
          **DK** = don't know

| | SA | A | A/D | D | SD | DK |
|---|---|---|---|---|---|---|
| 13. I don't like advertising on websites. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 14. Free offers and coupons are important to me. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 15. The quality of information provided on a site is important to me. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 16. The quantity of information provided on a site is important to me. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 17. Websites should keep information up-to-date. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 18. Websites should provide links to related sites. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 19. I like to be advised by e-mail if information on a site that I visit has been updated. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 20. Websites should be visually appealing. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 21. Graphics and photos are important. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 22. It must be easy to find what I need. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |
| 23. I prefer online documents that require minimal scrolling. | ☐ | ☐ | ☐ | ☐ | ☐ | ☐ |

## D. Tell a bit about your use of computer communications.

24. The number of times that I use each of the following **per month** is (circle only one answer per item):

- e-mail

  | 0 | 1-4 | 5-8 | 9-12 | 13-16 | over 16 |

- e-commerce (i.e., online shopping, banking)

  | 0 | 1-4 | 5-8 | 9-12 | 13-16 | over 16 |

- asynchronous discussions (e.g., electronic bulletin boards, listservs, mail lists)

  | 0 | 1-4 | 5-8 | 9-12 | 13-16 | over 16 |

- chats ("real-time" or "live", e.g. MSN)

  | 0 | 1-4 | 5-8 | 9-12 | 13-16 | over 16 |

- online databases (e.g., library catalogues)

  | 0 | 1-4 | 5-8 | 9-12 | 13-16 | over 16 |

- blogs (personal online logs or journals)

  | 0 | 1-4 | 5-8 | 9-12 | 13-16 | over 16 |

- other websites

  | 0 | 1-4 | 5-8 | 9-12 | 13-16 | over 16 |

25. I most often access the Internet using (choose only one):

- ☐ dial-up (telephone modem)
- ☐ high-speed telephone (ADSL or other DSL)
- ☐ cable
- ☐ ISDN (telephone, Integrated Services Digital Network)
- ☐ wireless (satellite, point-to-point)
- ☐ don't know

26. I spend the following number of hours per week participating in virtual communities:

| 0 | 0.1-2.0 | 2.1-4.0 | 4.1-6.0 | 6.1-8.0 | 8.1-10.0 | over 10.0 |

27. I am prepared to spend the following number of hours participating in virtual communities each week:

| 0 | 0.1-2.0 | 2.1-4.0 | 4.1-6.0 | 6.1-8.0 | 8.1-10.0 | over 10.0 |

**E.    Tell us about your activities with virtual communities:**

28.   I **do** or **would** participate in virtual communities for the following reasons (mark all that apply):

- ☐ To find information about a topic of interest
- ☐ To interact with people who have a common interest or interests
- ☐ To join and participate in a community of practice (i.e. those practicing the same profession, vocation, hobby, skill, etc.)
- ☐ To meet new people
- ☐ To receive discounts or coupons on merchandise or services
- ☐ To share information or expertise in an area of personal knowledge
- ☐ To ask questions
- ☐ To answer questions
- ☐ To observe the interactions within the community without actively participating

29.   I **do no**t or **would not** participate in virtual communities for the following reasons (mark all that apply):

- ☐ I prefer communicating face-to-face or by telephone
- ☐ I'm not comfortable using computer technologies
- ☐ I don't own a computer
- ☐ I don't have access to the Internet
- ☐ I don't trust people online
- ☐ I have other interests and hobbies to which I dedicate my free time

F. The following questions ask about areas of your life other than computer communications.

30. I spend the following number of hours per week participating in the activities listed below (circle one period of time for each activity):

- Work or job (paid employment; including marking, lesson preparation, supervision, school-sponsored extracurricular activities with students, etc.)

| 0 | 0.1-5.0 | 5.1-10.0 | 10.1-20.0 | 20.1-30.0 | 30.1-40.0 | 40.1-50.0 | over 50.0 |

- Education (studying outside of work)

| 0 | 0.1-5.0 | 5.1-10.0 | 10.1-20.0 | 20.1-30.0 | 30.1-40.0 | 40.1-50.0 | over 50.0 |

- Volunteer activities (community groups, charities, etc.)

| 0 | 0.1-5.0 | 5.1-10.0 | 10.1-20.0 | 20.1-30.0 | 30.1-40.0 | 40.1-50.0 | over 50.0 |

- Spiritual activities (church, religious observances, etc.)

| 0 | 0.1-5.0 | 5.1-10.0 | 10.1-20.0 | 20.1-30.0 | 30.1-40.0 | 40.1-50.0 | over 50.0 |

- Work-related activities (union activities, professional/specialist associations, etc.)

| 0 | 0.1-5.0 | 5.1-10.0 | 10.1-20.0 | 20.1-30.0 | 30.1-40.0 | 40.1-50.0 | over 50.0 |

- Family-related activities (include all time spent with members of immediate and extended family)

| 0 | 0.1-5.0 | 5.1-10.0 | 10.1-20.0 | 20.1-30.0 | 30.1-40.0 | 40.1-50.0 | over 50.0 |

- Social activities with friends

| 0 | 0.1-5.0 | 5.1-10.0 | 10.1-20.0 | 20.1-30.0 | 30.1-40.0 | 40.1-50.0 | over 50.0 |

- Sports activities (as participant, coach, official, etc) and exercise activities

| 0 | 0.1-5.0 | 5.1-10.0 | 10.1-20.0 | 20.1-30.0 | 30.1-40.0 | 40.1-50.0 | over 50.0 |

- House and yard work

| 0 | 0.1-5.0 | 5.1-10.0 | 10.1-20.0 | 20.1-30.0 | 30.1-40.0 | 40.1-50.0 | over 50.0 |

## G. Tell a little bit about yourself.

31. Please select the most appropriate description of your current employment situation (choose only one answer):

☐ Teacher, public school system
☐ Administrator, pubic school system
☐ District level personnel, public school system (i.e. superintendent, director)
☐ Teacher, independent school
☐ Administrator, independent school
☐ District level personnel, independent schools (i.e. director, superintendent)
☐ Instructor, post-secondary school system (i.e. universities, colleges)
☐ Working in a field related to education (i.e. BCTF, Ministry of Education)
☐ On leave of absence (educational, sick, paid or unpaid leave, etc.)
☐ On long-term disability
☐ Currently seeking employment as a teacher/administrator/instructor
☐ Employed in other fields
☐ Not employed, by choice (caring for children or parent, traveling, etc.)
☐ Retired

32. Please indicate your age (choose only one answer):

☐ 21 – 30
☐ 31 – 40
☐ 41 – 50
☐ 51 – 60
☐ 61 – 70
☐ 71 – 80
☐ 81 and over

Thank you for your participation. A summary of the final report analyzing this data will be supplied to the Superintendent of Schools for your district once it has been accepted by the Faculty of Graduate Studies, University of Alberta.

# Appendix D

# Number of Teachers and Administrators within the

# Public School Education System in British Columbia

| TEACHERS INFORMATION | | | | BRITISH COLUMBIA | |
|---|---|---|---|---|---|

(includes information from previous SLD reports 2040, 2052, 2057, 2059, 2062, 2063, 2067, 2085, 2087, and 2089)

| Teachers (public schools only) | 2000/01 | 2001/02 | 2002/03 | 2003/04 | 2004/05 |
|---|---|---|---|---|---|
| Full-Time Total | 27,134 | 26,909 | 25,614 | 25,095 | 24,992 |
| Full-Time Female | 16,779 | 16,711 | 16,008 | 15,741 | 15,835 |
| Full-Time Male | 10,355 | 10,198 | 9,606 | 9,354 | 9,157 |
| | | | | | |
| Part-Time Total | 9,880 | 9,741 | 8,461 | 8,421 | 8,322 |
| Part-Time Female | 8,503 | 8,377 | 7,260 | 7,292 | 7,234 |
| Part-Time Male | 1,377 | 1,364 | 1,201 | 1,129 | 1,088 |
| | | | | | |
| Total FTE | 32,955.7 | 32,768.9 | 30,869.6 | 30,350.6 | 30,179.9 |
| Female FTE | 21,776.3 | 21,741.5 | 20,499.3 | 20,269.8 | 20,328.7 |
| Male FTE | 11,179.3 | 11,027.4 | 10,370.3 | 10,080.9 | 9,851.2 |
| | | | | | |
| Average FTE Salary (Base only) | $54,497 | $54,648 | $58,323 | $60,188 | $60,352 |
| Female | $53,652 | $53,865 | $57,613 | $59,498 | $59,660 |
| Male | $56,143 | $56,190 | $59,728 | $61,576 | $61,780 |
| | | | | | |
| Average FTE Salary (Including all allowances) | $54,738 | $54,903 | $58,614 | $60,479 | $60,660 |
| Female | $53,836 | $54,062 | $57,842 | $59,727 | $59,908 |
| Male | $56,495 | $56,561 | $60,138 | $61,992 | $62,212 |
| | | | | | |
| Certificates Held by Teachers (Total) | | | | | |
| Basic | 241 | 215 | 183 | 162 | 146 |
| Letter of Permission | 168 | 183 | 163 | 174 | 188 |
| Professional | 33,330 | 33,052 | 30,781 | 30,322 | 30,198 |
| Standard | 3,275 | 3,200 | 2,948 | 2,858 | 2,782 |
| | | | | | |
| Certificates Held by Teachers (Female) | | | | | |
| Basic | 216 | 189 | 160 | 144 | 127 |
| Letter of Permission | 97 | 108 | 93 | 106 | 119 |
| Professional | 22,268 | 22,181 | 20,623 | 20,460 | 20,572 |
| Standard | 2,701 | 2,610 | 2,392 | 2,323 | 2,251 |
| | | | | | |
| Certificates Held by Teachers (Male) | | | | | |
| Basic | 25 | 26 | 23 | 18 | 19 |
| Letter of Permission | 71 | 75 | 70 | 68 | 69 |
| Professional | 11,062 | 10,871 | 10,158 | 9,862 | 9,626 |
| Standard | 574 | 590 | 556 | 535 | 531 |

Table D1.   Annual employment statistics of teachers within the public education system. Taken from Information Department (2004). *Educator Report 2000/01 – 2004/04: Provincial*. BC: Ministry of Education.

| ADMINISTRATORS INFORMATION | | | | | BRITISH COLUMBIA |

(includes information from previous SLD reports 2040, 2052, 2057, 2059, 2062, 2063, 2067, 2085, 2087, and 2089)

| Principals, Vice-Principals and other District Administrative Staff (public schools only) | 2000/01 | 2001/02 | 2002/03 | 2003/04 | 2004/05 |
|---|---|---|---|---|---|
| Full-Time Total | 3,054 | 3,042 | 2,960 | 2,911 | 2,878 |
| Full-Time Female | 1,244 | 1,284 | 1,277 | 1,303 | 1,313 |
| Full-Time Male | 1,810 | 1,758 | 1,683 | 1,608 | 1,565 |
| | | | | | |
| Part-Time Total | 160 | 187 | 115 | 135 | 139 |
| Part-Time Female | 135 | 142 | 90 | 111 | 118 |
| Part-Time Male | 25 | 45 | 25 | 24 | 21 |
| | | | | | |
| Total FTE | 3,157.6 | 3,160.7 | 3,031.3 | 2,994.3 | 2,965.9 |
| Female FTE | 1,330.9 | 1,374.2 | 1,332.9 | 1,372.1 | 1,388.4 |
| Male FTE | 1,826.7 | 1,786.5 | 1,698.4 | 1,622.2 | 1,577.5 |
| | | | | | |
| Average FTE Salary (Base only) | $74,715 | $75,684 | $79,527 | $81,392 | $82,769 |
| Female | $72,072 | $72,952 | $77,187 | $79,091 | $80,426 |
| Male | $76,641 | $77,785 | $81,364 | $83,338 | $84,831 |
| | | | | | |
| Average FTE Salary (Including all allowances) | $78,074 | $79,034 | $83,129 | $84,999 | $86,084 |
| Female | $75,467 | $76,365 | $80,833 | $82,731 | $83,900 |
| Male | $79,973 | $81,086 | $84,931 | $86,918 | $88,006 |
| | | | | | |
| Certificates Held by Administrators (Total) | | | | | |
| Basic | 5 | 5 | 5 | 6 | 5 |
| Letter of Permission | 11 | 9 | 8 | 10 | 10 |
| Professional | 3,081 | 3,096 | 2,948 | 2,906 | 2,871 |
| Standard | 117 | 119 | 114 | 124 | 131 |
| | | | | | |
| Certificates Held by Administrators (Female) | | | | | |
| Basic | 4 | 4 | 4 | 4 | 4 |
| Letter of Permission | 9 | 7 | 7 | 9 | 9 |
| Professional | 1,280 | 1,328 | 1,276 | 1,313 | 1,319 |
| Standard | 86 | 87 | 80 | 88 | 99 |
| | | | | | |
| Certificates Held by Administrators (Male) | | | | | |
| Basic | 1 | 1 | 1 | 2 | 1 |
| Letter of Permission | 2 | 2 | 1 | 1 | 1 |
| Professional | 1,801 | 1,768 | 1,672 | 1,593 | 1,552 |
| Standard | 31 | 32 | 34 | 36 | 32 |

Table D2. Annual employment statistics for district and school administrators within the public education system. Taken from: Information Department (2004). *Educator Report 2000/01 – 2004/04: Provincial*. BC: Ministry of Education.

According to the statistics provided by the provincial Ministry of Education, the following is true for the public school education system for 2004/2005:

- The total number of full- and part-time educators in is 36331 (33145.8 FTE).
- The total number of full- and part-time teachers is 33314 (30179.9 FTE).
- The total number of full- and part-time district and school administrators is 3017 (2965.9 FTE).

Thus, the following can be considered true:

- 91.70% of educators are employed as teachers.
- 8.30% of educators are employed as district and school administrators.

# Appendix E

## Sample Size

Standard confidence interval and levels have been used in calculation of the sample size. This calculation represents that number of *returned* questionnaires that are required for an accurate sampling. As cited in Cui (2003), Mills has found that for educated, homogenous groups the response rate when TDM is employed ranges from 60 to 80%. For purposes of this calculation, however, we will err on the side of caution and assume a response rate of 50% for the BCCT survey.

The formula for calculating sample size and a correction formula for finite populations is shown. The final sample size must be adjusted to account for the anticipated non-response rate in order to determine the total number of surveys that must be sent out for a representative sample.

**Sample Size:**

$$SS = \frac{Z^2 * (p) * (1-p)}{C^2}$$

**Correction for Finite Population:**

$$SS_c = \frac{SS}{1 + \frac{SS - 1}{pop}}$$

**Total number of surveys to be mailed (initially):**

$$X = SS_c \frac{1}{AR}$$

| | |
|---|---|
| **SS** | = sample size |
| **Z** | = "Z" value for confidence level (i.e. 95% is 1.96, 99% is 2.576) |
| **P** | = percentage picking a choice, expressed as decimal (0.5 is standard) |
| **C** | = confidence interval, expressed as decimal |
| **SS$_c$** | = corrected sample size (for finite population) |
| **pop** | = population size |
| **AR** | = anticipated response rate, expressed as decimal |
| **X** | = total number of surveys to mail |

Thus, for a population of 64,922 with a confidence level and interval of 95% and 7.5%, the size of mail-out is:

**SS** $= (1.96^2 * 0.5 * (1 - 0.5))/ .075^2$ **SSc** $= 171/(1+((171 - 1)/64922))$ **X** $= 170.5 * (1/0.5)$
= 171    = 170.6    = 341.2

| Confidence Level | Confidence Interval | Sample Size (corrected) | Total Mail-out |
|---|---|---|---|
| 95 | 5 | 382 | 764 |
| 95 | 6.25 | 245 | 490 |
| 95 | 6.5 | 227 | 454 |
| 95 | 7.5 | 170 | 340 |
| 99 | 8 | 259 | 518 |
| 99 | 10 | 166 | 332 |

Table E1.    Total number of surveys that must be mailed in first distribution for various confidence levels and intervals, assuming 50%return rate and population of 64,922.

**Appendix F**

**Ten-variable Model of Response Rate Variation**

According to Cui (2003), in 1978, Heberlein and Baumgartner determined ten variables that predict 66% of the variation in final response rates. Seven of the ten have a positive effect and three have a negative effect.

Variables having positive effects:

1. *The number of contacts.* More contact means more responses; advance letters, follow-up postcards, letters, and telephone calls are possible modes of contact.
2. *Salience of the topic.* If the survey has little or no meaning for the recipient, it is unlikely it will be completed and returned.
3. *Government sponsorship.*
4. *Employee population.* Special subgroups, such as employees from certain occupations, are more likely to respond than the general public.
5. *School or army population.* Similar to number 4.
6. *Special third contact.* Follow-up the advance letter and initial follow-up with the use of special mailing processes, such as certified or special delivery.
7. *Incentive on the first contact.* Incentives included with the first mailing increases response rates.

Variables having negative effects:

1. *Marketing research sponsorship.*
2. *General population.*
3. *Questionnaire length.* Longer questionnaires have lower response rates.

Cui (2003) reports that Goyder replicated these results, except the negative effect of market research sponsorship had disappeared, in 1982. In a related study in 1993 (as cited in Cui), Church determined that incentives sent with the initial mailing of the questionnaires increased response rates markedly over incentives sent upon receipt (by the researcher) of the questionnaire. Church found little statistical difference between the use of monetary and non-monetary incentives.

# Appendix G

# Total Design Method

Cui (2003) reports that Don Dillman developed Total Design Method (TDM) in 1978 as a "comprehensive system used to accomplish higher response rates for mail surveys" (The Total Design Method for improving return rates section, ¶1). It is based in social exchange theory and holds that questionnaire development and implementation process should provide three conditions in order to be successful:

1. The perceived cost for the respondent must be reduced (i.e. make the questionnaire short and easy to complete).
2. The perceived rewards must be increased (i.e. make questionnaire interesting to complete).
3. Trust is paramount and must be increased (i.e. use official stationery and sponsorship).

Among other points of advice, TDM recommends the following distribution schedule, which consists of four carefully spaced mailings:

| | |
|---|---|
| Week Zero | Initial questionnaire and cover letter sent at one time. |
| Week One | Postcard follow-up reminding to return questionnaire. |
| Week Four | Replacement questionnaire and letter indicating that the questionnaire has not been received. |
| Week Seven | Second replacement questionnaire and cover letter to non-respondents by certified mail. |

Components of the suggested schedule have been employed in the design of the data collection methodology for this research project (see Appendix H).

## Appendix H

## Details of Data Collection

1. **Design questionnaire**.

   Appendix D.

2. **Pre-test questionnaire**.

   Pre-testing (focus group and respondent debriefing) is conducted using BCCT members who are not members of the sample.

3. **Adjust and/or modify questionnaire.**

   Required modifications to the questionnaire, as revealed by the pre-testing process, are made.

4. **Pre-test again.**

   If necessary, pre-test again using different BCCT members. This step was not necessary within this study.

5. **Supply notification of upcoming survey to sample population.**

   Notification of the upcoming survey to all members of the sample was accomplished using a print ad (Appendix I) distributed by mail and posted on a district electronic bulletin board.

6. **Distribute initial cover letter, consent form, and questionnaire.**

   The cover letter describes the significance of the research, identifies the researcher and university, emphasizes the importance of their response, and assures the confidentiality of the project (Appendix J).

7. **Send follow-up letter, consent form, and replacement questionnaire to non-respondents.**

   Three weeks after the initial distribution, a follow-up letter and replacement questionnaire is sent to individuals who had not yet responded to the survey. The letter indicates that their questionnaire has not yet been received (Appendix K).

8. **Send final follow-up letter, consent form, and replacement questionnaire to non-respondents.**

   Five weeks after the initial distribution, a final request is sent to those individuals who have not yet responded to the survey (Appendix L).

9. **Tabulate results and analyze.**

10. **Send thank you cards to respondents.**

    Once all responses are received and recorded, thank you cards are sent to all members of the sample who returned their questionnaire.

**Appendix I**

**Announcement Card**

**Appendix J**

**Cover Letter Sent with First Distribution**

March 16, 2005

**Research Opportunity**

UNIVERSITY OF
**ALBERTA**

*[Name]
*[School or home address]

Dear Mr./Ms. *:

As a graduate student at the University of Alberta in the *Master of Arts in Communications and Technology* program, I am contacting you to request your assistance in completing a research project that I have undertaken in partial fulfillment of the requirements for the degree.

I am researching professional educators' use of virtual communities – gathering places on the Internet in which visitors use "live" chats, e-mail, bulletin boards, postings, and multimedia to generate interactions both through the exchange of ideas, information, opinions, contacts, inquiries, knowledge, skills, and through social networking. The research question is: *What factors influence whether or not professional educators participate in virtual communities?*

The enclosed survey addresses four areas that may influence a member's participation in a virtual community: technical availability and ability, preferred communication activities, community content, and outside obligations and interests that draw people away from virtual communities. Individuals holding British Columbia College of Teachers certificates in School District No. 46 have been selected as a representative sample of provincial population of professional educators to answer the questionnaire. I hope you will be able to take ten minutes of your time to assist me.

Responses to the survey are confidential and will not be shared with any third party except in the form of the final report in which no individual responses or participant will be distinguished. Participants are identified to the researcher by code number only. The code number is required for data classification purposes and to prevent survey responses from being counted more than once. The District Technology Manager has volunteered to prepare, distribute, and receive the surveys. I will not have access to your name or any personal information held by the School District.

Your participation in the study is voluntary; a request for your consent precedes the questionnaire. Please complete the consent portion of the survey prior to returning the completed questionnaire. Complete this portion of the survey and return it in the enclosed self-addressed envelope even if you do not wish to participate so that accurate records of surveys distributed and returned may be maintained and so that you will not be bothered with follow-up requests for return of the questionnaire.

If you have any questions or concerns about the survey or study, please do not hesitate to contact me, my research supervisor, Dr. Dennis Foth, or the program Director, Dr. Marco Adria, by phone or e-mail, as listed below. A summary of the results will be supplied to the School District once my report is complete and accepted by the Faculty of Graduate Studies at the University of Alberta.

The plan for this study has been reviewed for its adherence to ethical guidelines and approved by the Faculties of Education and Extension Research Ethics Board (EE REB) at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Chair of the EE REB at (780) 492-3751

I thank you for taking the time to respond. Your participation is greatly appreciated.

Sincerely,

Barbara Kelly, BEd
Graduate Student, University of Alberta

| **Barbara Kelly** | **Dennis Foth, PhD** | **Marco Adria, PhD** |
|---|---|---|
| bkelly@ualberta.ca | dennis.foth@ualberta.ca | marco.adria@ualberta.ca |
| 604-886-7710 (evenings) | 780-492-5865 | 780-492-2254 |

# Appendix K

# Cover Letter Sent with Second Distribution

April 6, 2005

**Research Opportunity**
UNIVERSITY OF
**ALBERTA**

*[Name]
*[School or home address]

Dear Mr./Ms. *:

Approximately three weeks ago, you received the enclosed survey and a letter explaining a research project that I am conducting in your district as partial fulfillment of the requirements for the *Master of Arts in Communications and Technology* degree at the University of Alberta.

This second survey is being forwarded to you because the District Technology Manager has not received a response from you. I hope you will take 10 minutes of your time to complete the survey and return it in the District Technology Manager using the enclosed envelope. If your response and this reminder have crossed paths in the distribution system, please write "returned previously" across the top page and return the survey in the self-addressed envelope. If you prefer not to participate, please indicate that on the consent portion of the survey and, again, return it in the enclosed envelope.

If you have any questions or concerns about the survey or study, please do not hesitate to contact me, my research supervisor, Dr. Dennis Foth, or the program Director, Dr. Marco Adria, by phone or e-mail, as listed below. A summary of the results will be supplied to the School District once my report is complete and accepted by the Faculty of Graduate Studies at the University of Alberta.

The plan for this study has been reviewed for its adherence to ethical guidelines and approved by the Faculties of Education and Extension Research Ethics Board (EE REB) at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Chair of the EE REB at (780) 492-3751.

I thank you for taking the time to respond. Your participation is greatly appreciated.

Sincerely,

Barbara Kelly, BEd
Graduate Student, University of Alberta

| **Barbara Kelly** | **Dennis Foth, PhD** | **Marco Adria, PhD** |
|---|---|---|
| bkelly@ualberta.ca | dennis.foth@ualberta.ca | marco.adria@ualberta.ca |
| 604-886-7710 (evenings) | 780-492-5865 | 780-492-2254 |

## Appendix L

## Cover Letter Sent with Third Distribution

April 21, 2005

**Research Opportunity**

UNIVERSITY OF
**ALBERTA**

*[Name]
*[School or home address]

Dear Mr./Ms. *:

During the last five weeks two copies of the enclosed survey have been sent to you through the District Technology Manager. A response from you has not yet been received.

I am conducting a research project in your district about professional educators' use of virtual (online) communities as the final requirement of a *Master of Arts in Communications and Technology* at the University of Alberta. I hope you will take ten minutes of your time to assist me.

Please complete the enclosed survey and return it through the district internal mail system in the envelope supplied. The survey will be received by the District Technology Manager who will remove the consent form and forward the anonymous survey to me. I will receive no personal information about you.

If your response and this reminder have crossed paths in the distribution system, please write "returned previously" across the top page and return the survey in the self-addressed envelope. If you prefer not to participate, please indicate that on the consent portion of the survey and, again, return it in the enclosed envelope.

If you have any questions or concerns about the survey or study, please do not hesitate to contact me, my research supervisor, Dr. Dennis Foth, or the program Director, Dr. Marco Adria, by phone or e-mail, as listed below. A summary of the results will be supplied to the School District once my report is complete and accepted by the Faculty of Graduate Studies at the University of Alberta.

The plan for this study has been reviewed for its adherence to ethical guidelines and approved by the Faculties of Education and Extension Research Ethics Board (EE REB) at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Chair of the EE REB at (780) 492-3751.

I thank you for taking the time to respond. Your participation is greatly appreciated.

Sincerely,

Barbara Kelly, BEd
Graduate Student, University of Alberta

---

| **Barbara Kelly** | **Dennis Foth, PhD** | **Marco Adria, PhD** |
| bkelly@ualberta.ca | dennis.foth@ualberta.ca | marco.adria@ualberta.ca |
| 604-886-7710 (evenings) | 780-492-5865 | 780-492-2254 |

# Appendix M

# Age Distribution

**Respondents' Ages**



1 = 21-30 yrs
2 = 31-40 yrs
3 = 41-50 yrs
4 = 51-60 yrs
5 = 61 - 70 yrs

N = 157
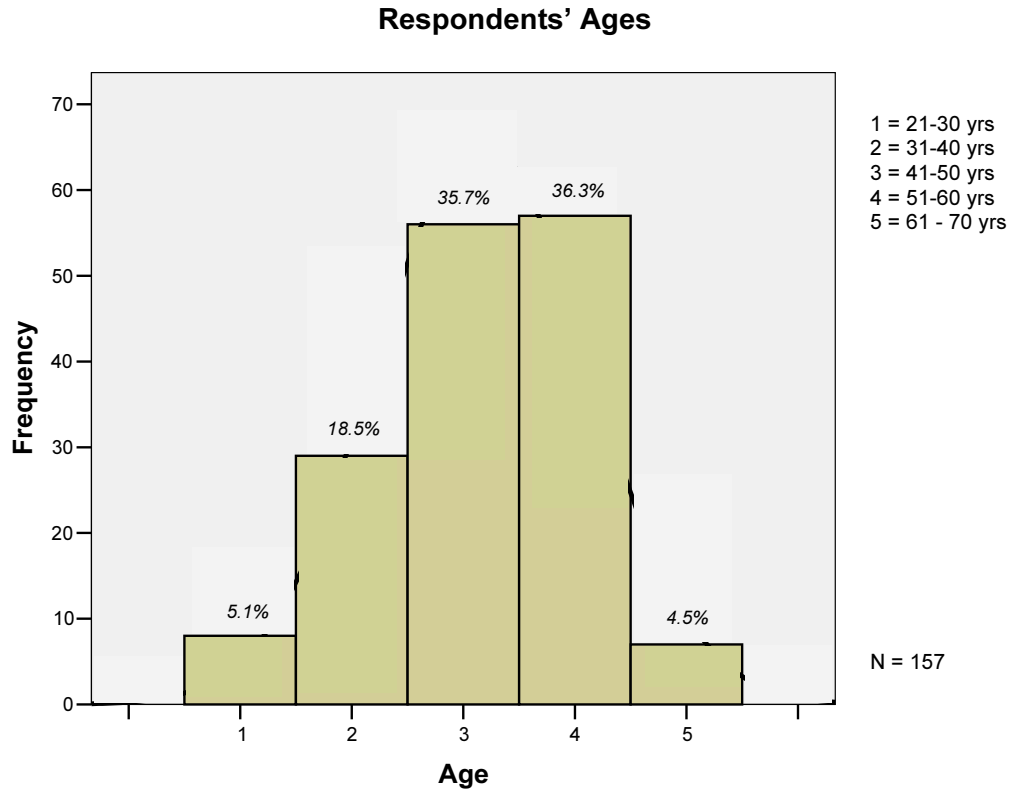
Distribution of respondents' ages.

## Appendix N

## Technology

**Comfort Using the Internet**
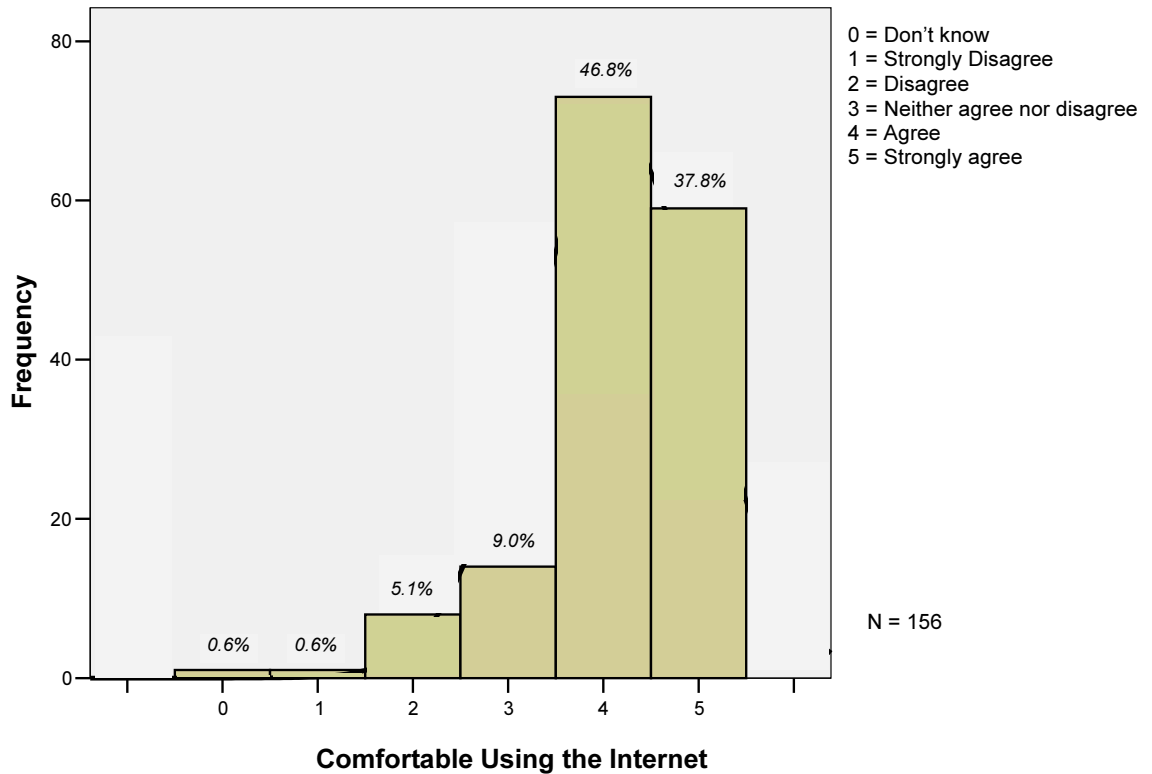


Figure N1.  Distribution of level of comfort with using computer technologies indicates more than 80% of respondents are comfortable using the Internet.

**Measurements of Access to Technology**

|  |  | Frequency | Valid % | Cumulative % |
|---|---|---|---|---|
| Not Comfortable with Computer Technologies | No | 143 | 91.1 | 91.1 |
|  | Yes | 14 | 8.9 | 100.0 |
| Do Not Own a Computer | No | 153 | 97.5 | 97.5 |
|  | Yes | 4 | 2.5 | 100.0 |
| No Internet Access | No | 154 | 98.1 | 98.1 |
|  | Yes | 3 | 1.9 | 100.0 |

Table N1.  Measurements of levels of discomfort using computer technologies, respondents not owning a computer, and levels of Internet access indicate that lack of access to technology due to equipment or skills is not an issue.

## Average Internet Use (sessions per week)

| Sessions per Week | Frequency | Valid % | Cumulative % |
|---|---|---|---|
| 0 | 2 | 1.3 | 1.3 |
| 1 | 6 | 3.9 | 5.2 |
| 2 | 6 | 3.9 | 9.1 |
| 3 | 11 | 7.1 | 16.2 |
| 4 | 11 | 7.1 | 23.4 |
| 5 | 17 | 11.0 | 34.4 |
| 6 | 3 | 1.9 | 36.4 |
| 7 | 16 | 10.4 | 46.8 |
| 8 | 5 | 3.2 | 50.0 |
| 9 | 0 | 0 | 50.0 |
| 10 | 13 | 8.4 | 58.4 |
| 11 | 2 | 1.3 | 59.7 |
| 12 | 4 | 2.6 | 62.3 |
| 13 | 0 | 0 | 62.3 |
| 14 | 4 | 2.6 | 64.9 |
| 15 | 12 | 7.8 | 72.7 |
| 16 | 3 | 1.9 | 74.7 |
| 17 | 0 | 0 | 74.7 |
| 18 | 3 | 1.9 | 76.6 |
| 19 | 1 | .6 | 77.3 |
| 20 | 7 | 4.5 | 81.8 |
| more than 20 | 28 | 18.2 | 100.0 |
| Total | 154 | 100.0 | |

Table N2. Frequency of Internet use measured in sessions per week (no minimum time requirement per session).

## Frequency of Internet Use (sessions per week)



This bar represent *more than 20 sessions per week*.

Mean = 10.62
N = 154
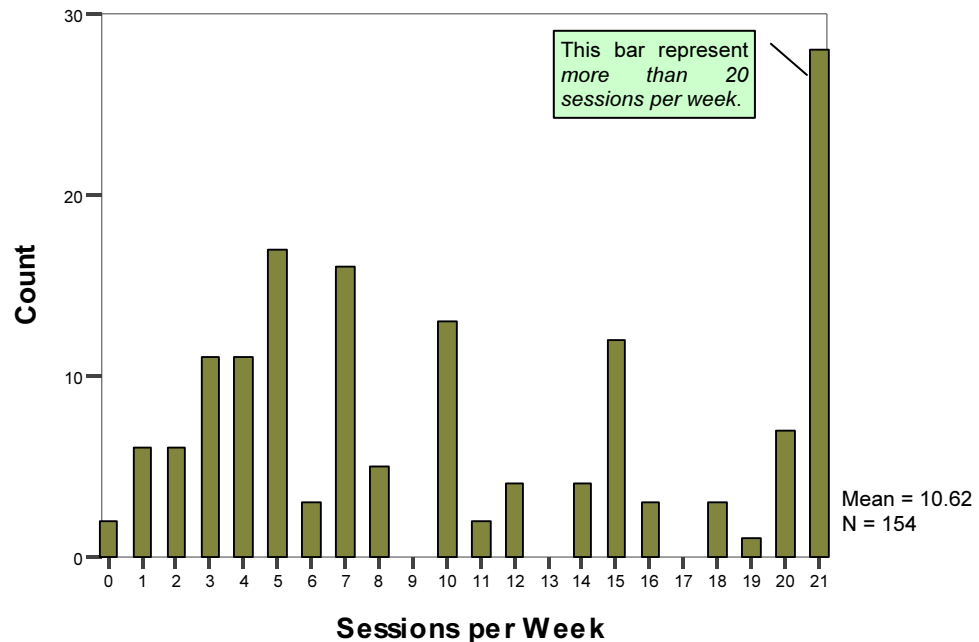
Figure N2. Frequency of Internet use demonstrates a wide range of responses with almost one-quarter using the Internet 20 times or more per week.

## Appendix O

## Content

**Use Internet to Access Information**

Table O1. Frequency of use of the Internet to access information.

|  | Frequency | Valid % | Cumulative % |
|---|---|---|---|
| Never | 1 | 0.6 | 0.6 |
| Seldom | 9 | 5.8 | 6.4 |
| Sometimes | 30 | 19.2 | 25.6 |
| Frequently | 73 | 46.8 | 72.4 |
| Always | 43 | 27.6 | 100.0 |
| Total | 156 | 100.0 | |

**Participation – Information About Topic of Interest**

|  | Frequency | Valid % | Cumulative % |
|---|---|---|---|
| No | 41 | 26.1 | 26.1 |
| Yes | 116 | 73.9 | 100.0 |
| Total | 157 | 100.0 | |

Table O2. Frequency of participation in virtual communities due to a topic of interest.

**Quality of Information is Important**



0 = Don't know
1 = Strongly Disagree
2 = Disagree
3 = Neither agree nor disagree
4 = Agree
5 = Strongly agree

N = 156
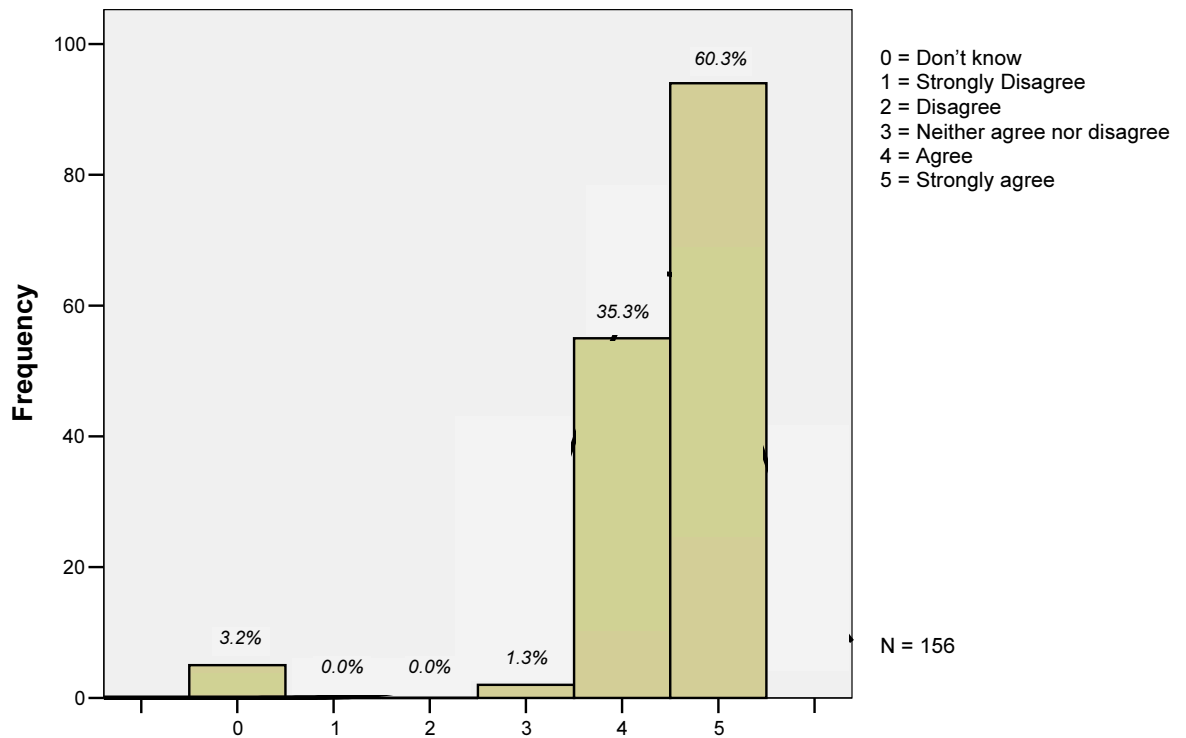
Figure O1. Distribution of opinions about the importance of up-to-date information being provided on sites.

**Quantity of Information is Important**



0 = Don't know
1 = Strongly Disagree
2 = Disagree
3 = Neither agree nor disagree
4 = Agree
5 = Strongly agree

N = 156
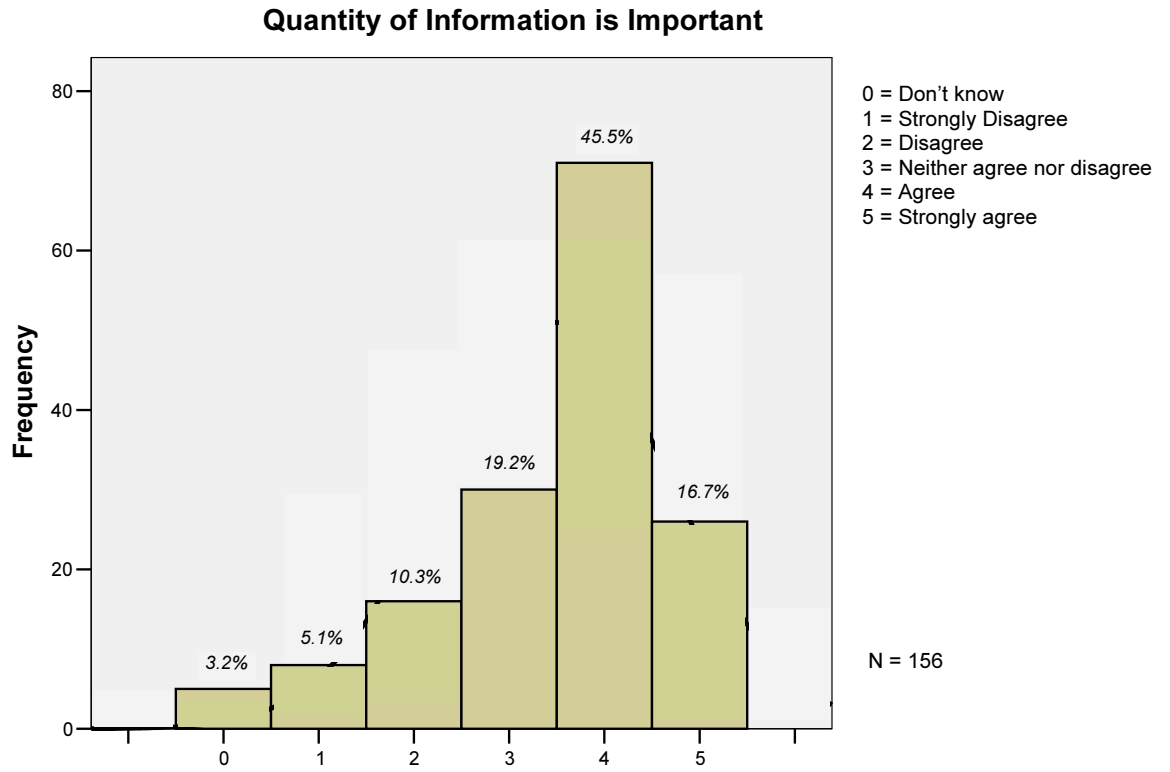
Figure O2.  Distribution of opinions about the importance of the quantity of information on sites.

**Information Should Be Up-to-Date**



0 = Don't know
1 = Strongly Disagree
2 = Disagree
3 = Neither agree nor disagree
4 = Agree
5 = Strongly agree

N = 156
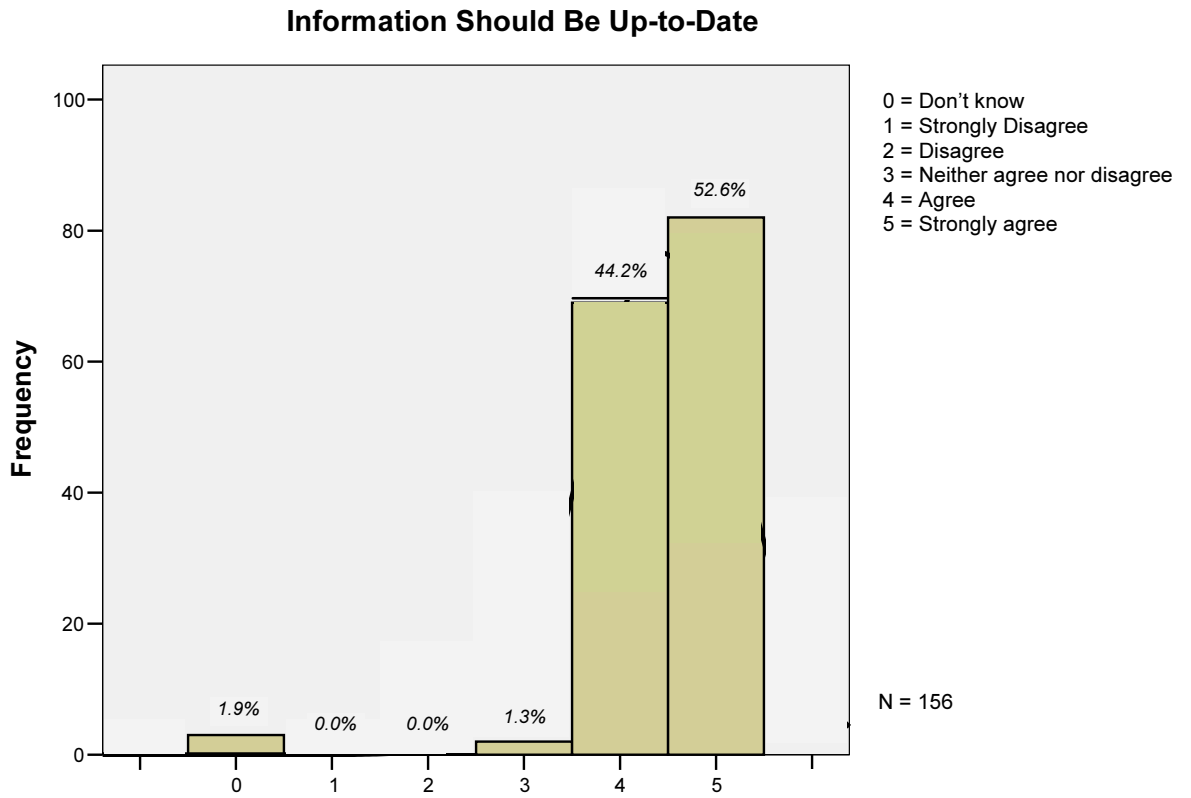
Figure O3.  Distribution of opinions about the importance of up-to-date information being provided on sites.

**Ease of Use is Important**

Frequency

0 = Don't know
1 = Strongly Disagree
2 = Disagree
3 = Neither agree nor disagree
4 = Agree
5 = Strongly agree

53.5%

41.4%

3.8%

1.3%   0.0%   0.0%

N = 157

0   1   2   3   4   5
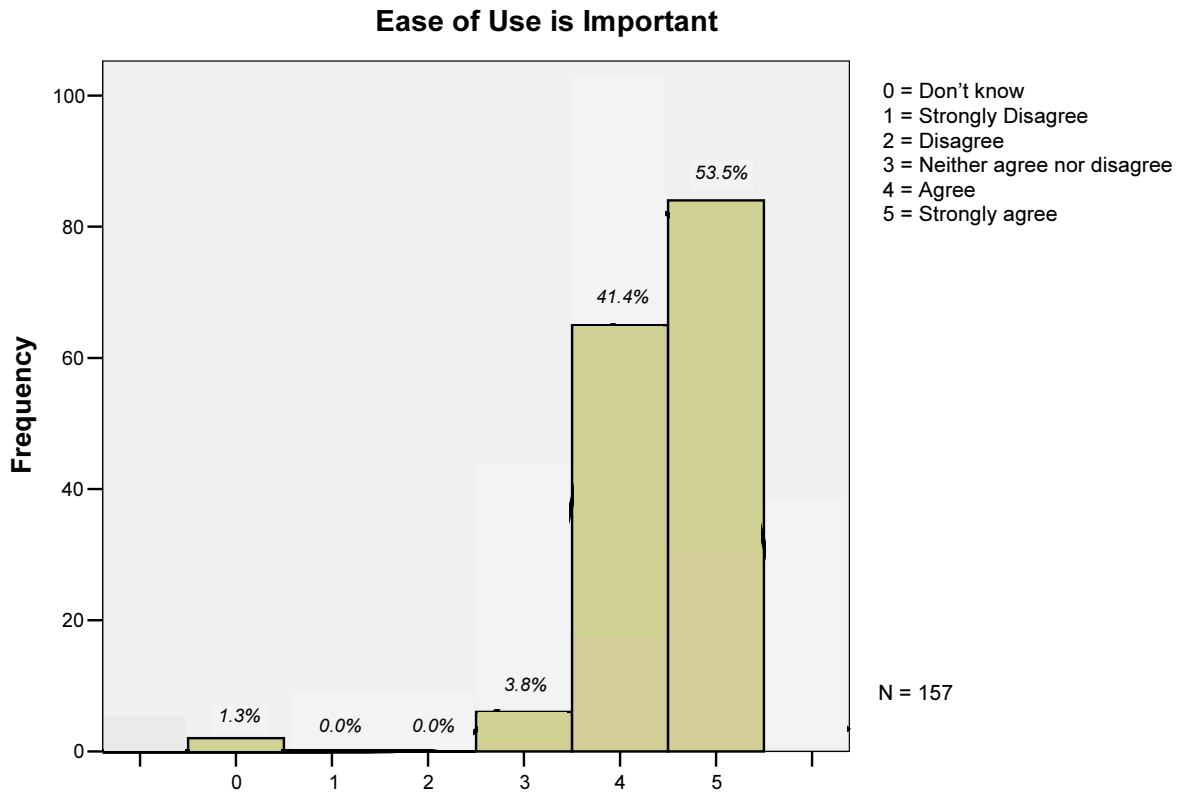
Figure O4.   Distribution of opinions about the importance of website ease of use.

**Prefer Minimal Scrolling**

Frequency

0 = Don't know
1 = Strongly Disagree
2 = Disagree
3 = Neither agree nor disagree
4 = Agree
5 = Strongly agree

47.1%

29.9%

14.0%

5.1%

3.2%   0.6%

N = 157

0   1   2   3   4   5
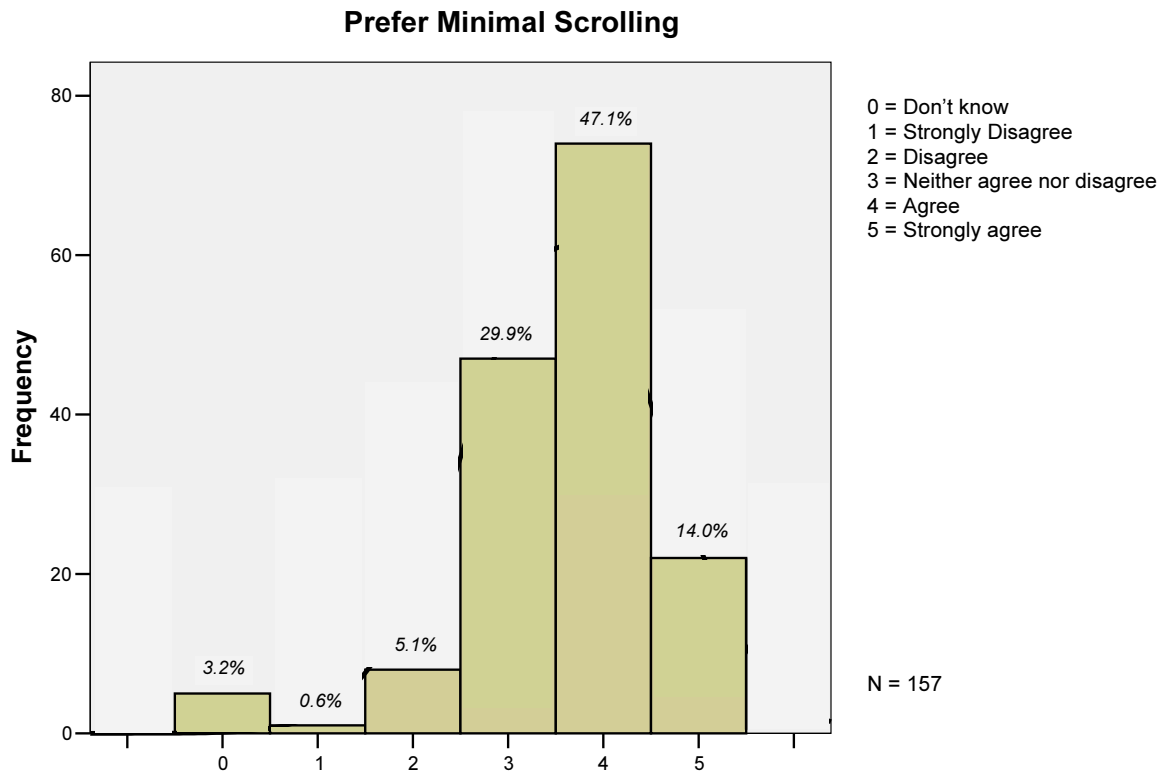
Figure O5.   Distribution of preferences for online documents that require minimal scrolling.

**Websites Should Be Visually Appealing**



0 = Don't know
1 = Strongly Disagree
2 = Disagree
3 = Neither agree nor disagree
4 = Agree
5 = Strongly agree

N = 157
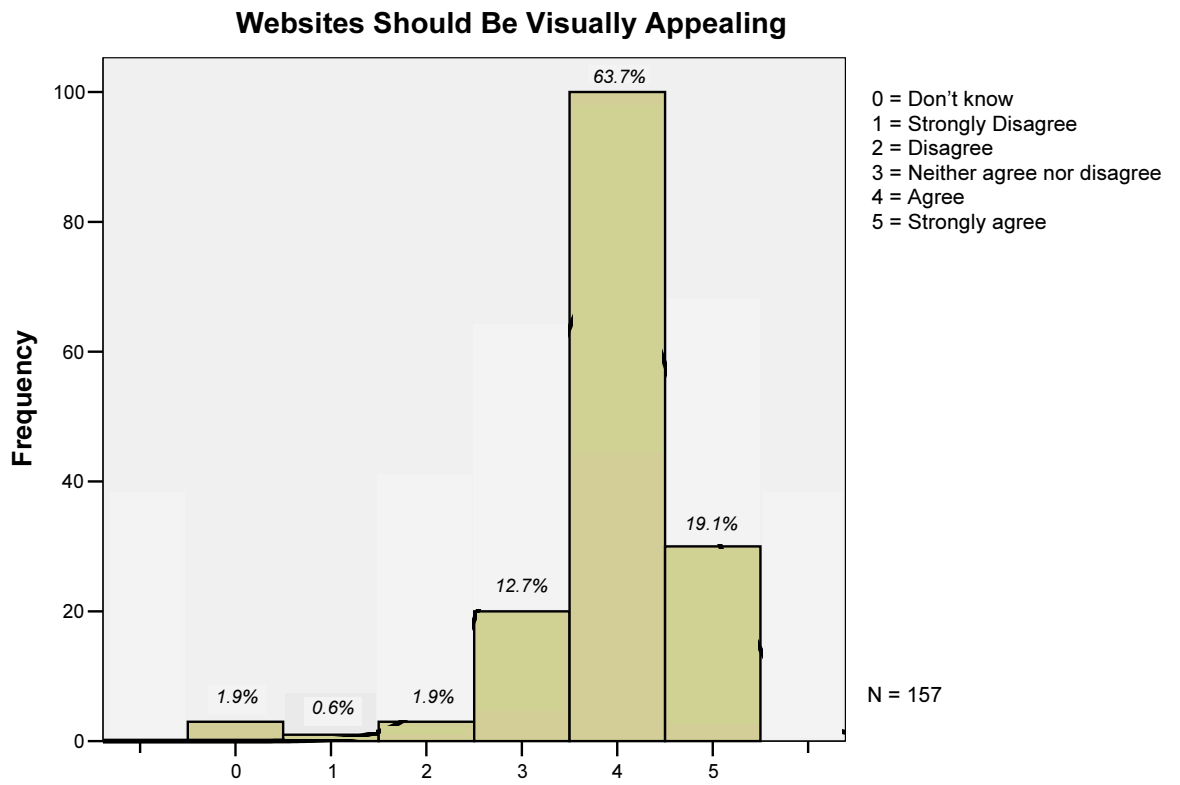
Figure O6.  Distribution of opinions about the importance of the visual appeal of websites.

**Graphics and Photos Are Important**



0 = Don't know
1 = Strongly Disagree
2 = Disagree
3 = Neither agree nor disagree
4 = Agree
5 = Strongly agree

N = 156
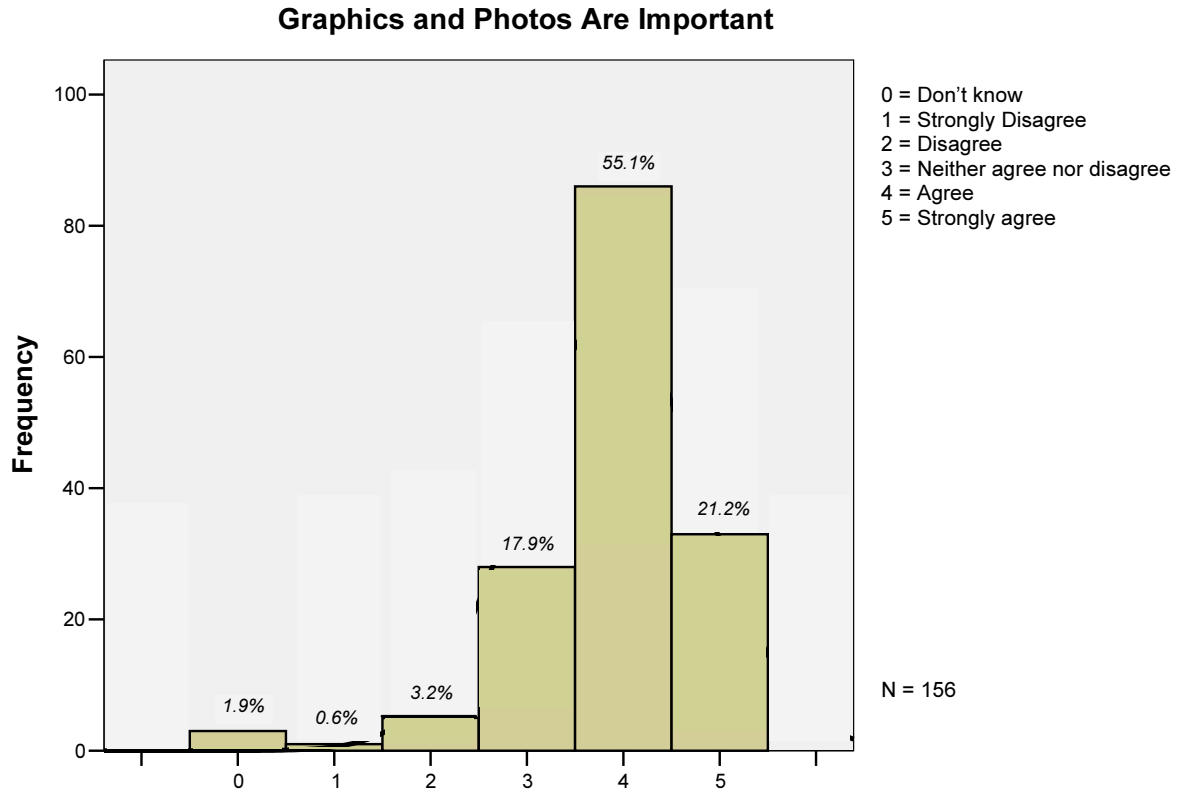
Figure O7.  Distribution of opinions about the importance of graphics and photos on websites.

**Attitudes about Advertising and Free Offers and Coupons on Websites**

|  | **Attitude** | **Frequency** | **Valid %** | **Cumulative %** |
|---|---|---|---|---|
| Dislike Advertising | Don't Know | 5 | 3.2 | 3.2 |
|  | Strongly disagree | 1 | 0.6 | 3.8 |
|  | Disagree | 6 | 3.8 | 7.6 |
|  | Neither agree nor disagree | 19 | 12.1 | 19.7 |
|  | Agree | 39 | 24.8 | 22.6 |
|  | Strongly Agree | 87 | 55.4 | 100.0 |
| Free Offers and Coupons are Important | Don't Know | 10 | 6.4 | 6.4 |
|  | Strongly disagree | 81 | 51.6 | 58.0 |
|  | Disagree | 35 | 22.3 | 80.3 |
|  | Neither agree nor disagree | 12 | 7.6 | 87.9 |
|  | Agree | 11 | 7.0 | 94.9 |
|  | Strongly Agree | 8 | 5.1 | 100.0 |

Table O3.  Attitudes about online advertising and free offers and coupons indicate a strong disapproval of advertising and a moderately strong disapproval of free offers and coupons on websites

**Participation – Service and/or Merchandise Discounts or Coupons**

|  | **Frequency** | **Valid %** | **Cumulative %** |
|---|---|---|---|
| No | 150 | 95.5 | 95.5 |
| Yes | 7 | 4.5 | 100.0 |
| Total | 157 | 100.0 |  |

Table O4.  Few educators would participate in virtual communities in order to receive discounts or coupons on merchandise or services.

**Links to Related Sites Should Be Provided**



0 = Don't know
1 = Strongly Disagree
2 = Disagree
3 = Neither agree nor disagree
4 = Agree
5 = Strongly agree

N = 157
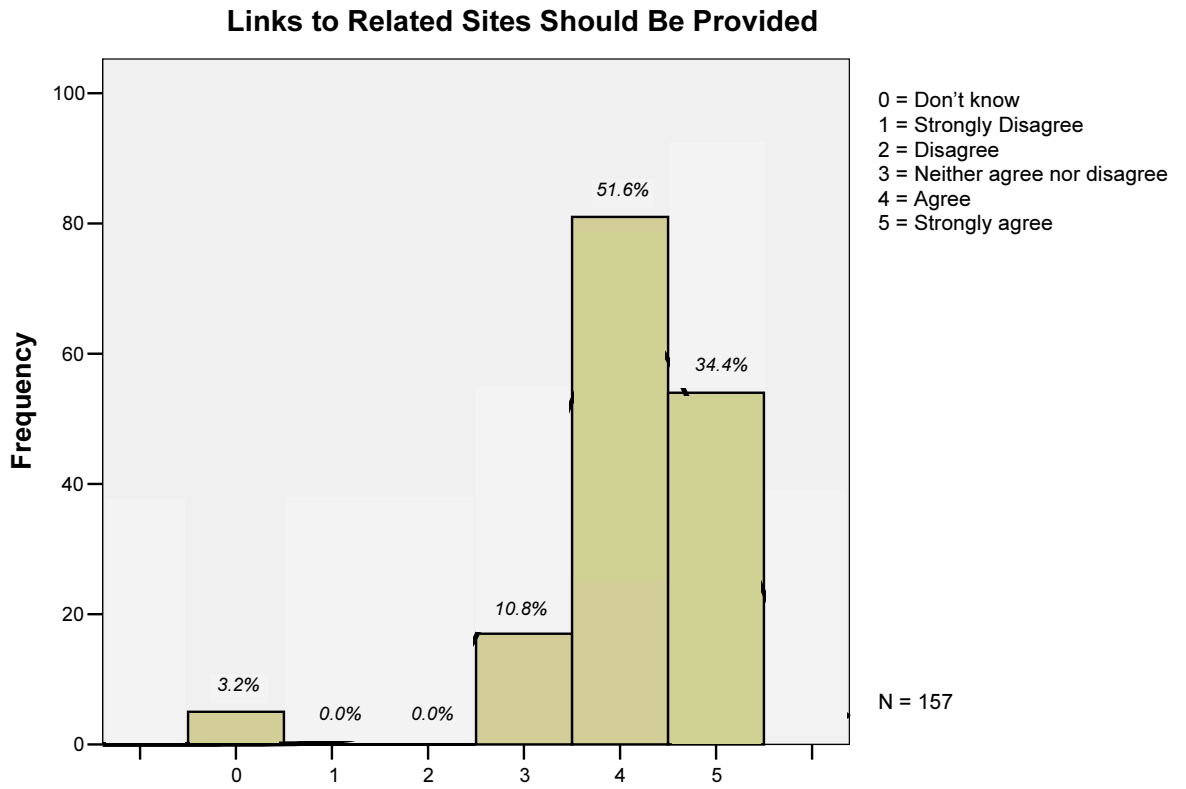
Figure O8.  Distribution of preferences for the provision of links to related websites.

**Preference for E-Mail Notification of Updated Information**



0 = Don't know
1 = Strongly Disagree
2 = Disagree
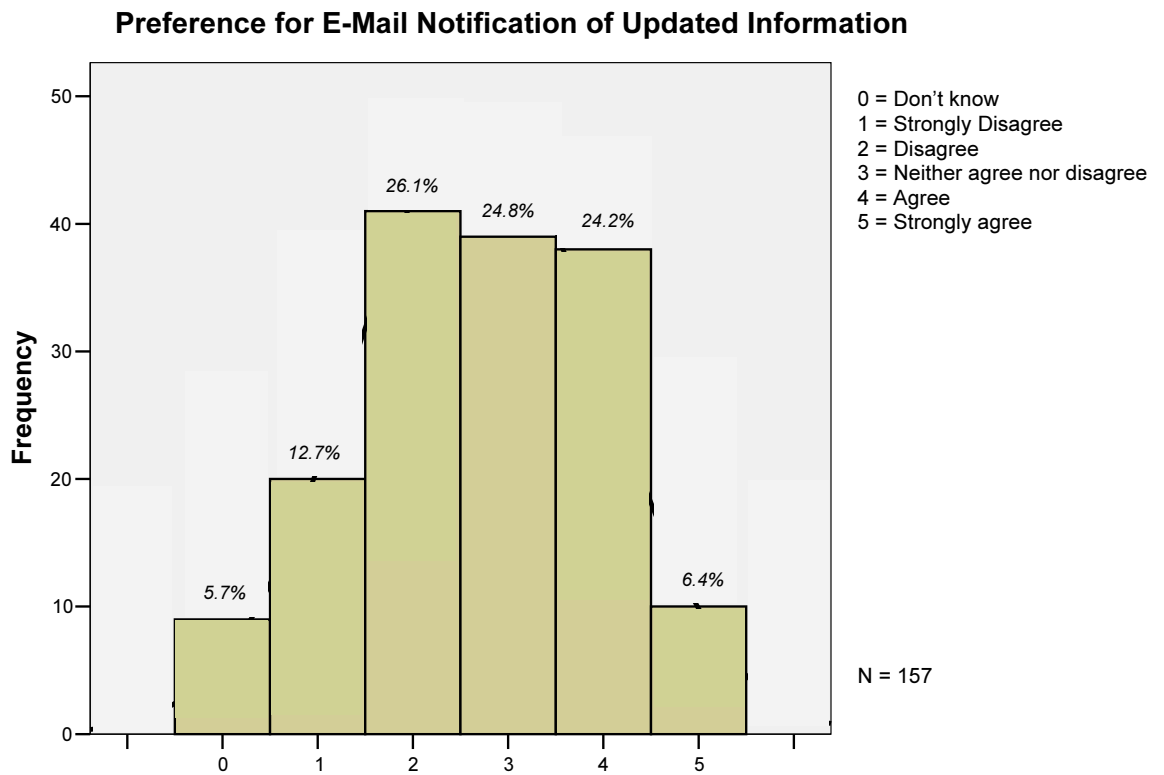3 = Neither agree nor disagree
4 = Agree
5 = Strongly agree

N = 157

Figure O9.  Distribution of preferences for e-mail notification of updated information on visited sites.

**Participation Rates in Virtual Communities**

| | Hours per Week | Frequency | Valid % | Cumulative % |
|---|---|---|---|---|
| Time Currently Spent Participating in Virtual Communities | 0 | 94 | 60.6 | 60.6 |
| | 0.1 – 2.0 | 34 | 21.9 | 82.6 |
| | 2.1 – 4.0 | 16 | 10.3 | 92.9 |
| | 4.1 – 6.0 | 3 | 1.9 | 94.8 |
| | 6.1 – 8.0 | 2 | 1.3 | 96.1 |
| | 8.0 – 10.0 | 1 | 0.6 | 96.8 |
| | over 10.0 | 5 | 3.2 | 100.0 |
| Time Prepared to Participate in Virtual Communities | 0 | 76 | 49.7 | 49.7 |
| | 0.1 – 2.0 | 52 | 34.0 | 83.7 |
| | 2.1 – 4.0 | 11 | 7.2 | 90.8 |
| | 4.1 – 6.0 | 4 | 2.6 | 93.5 |
| | 6.1 – 8.0 | 4 | 2.6 | 96.1 |
| | 8.0 – 10.0 | 0 | 0.0 | 96.1 |
| | over 10.0 | 6 | 3.9 | 100.0 |

Table O5.  Amount of time respondents currently devoted and are prepared to devote to participation in virtual communities. In general, respondents indicate only a slight increase over the time currently spent in virtual communities.

**Attitudes about the Usefulness and Interest-Value of Virtual Communities**

| | Attitude | Frequency | Valid % | Cumulative % |
|---|---|---|---|---|
| Virtual Communities are Useful | Don't know | 55 | 35.3 | 35.3 |
| | Strongly disagree | 10 | 6.4 | 41.7 |
| | Disagree | 14 | 9.0 | 50.6 |
| | Neither agree nor disagree | 41 | 26.3 | 76.9 |
| | Agree | 26 | 16.7 | 93.6 |
| | Strongly Agree | 10 | 6.4 | 100.0 |
| Virtual Communities are Interesting | Don't know | 50 | 31.8 | 31.8 |
| | Strongly disagree | 10 | 6.4 | 38.2 |
| | Disagree | 17 | 10.8 | 49.0 |
| | Neither agree nor disagree | 45 | 28.7 | 77.7 |
| | Agree | 26 | 16.6 | 94.3 |
| | Strongly Agree | 9 | 5.7 | 100.0 |

Table O6.  Attitudes about the usefulness and interest-value of virtual communities are similar.

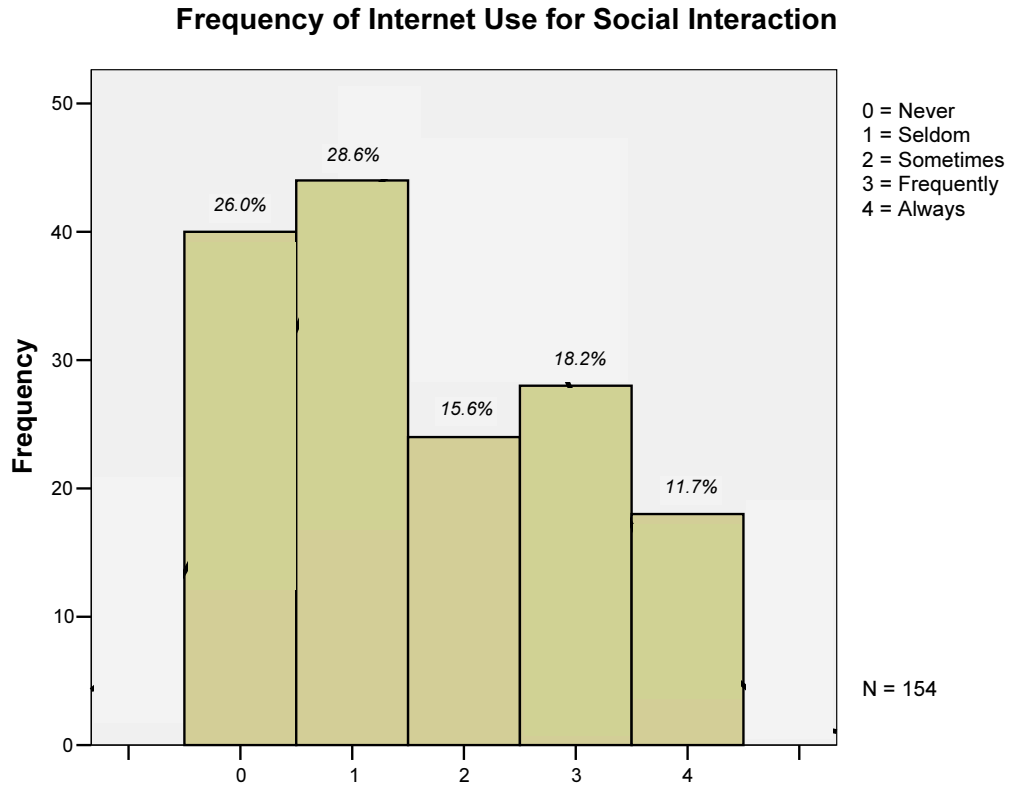# Appendix P

## Social Interactions

**Frequency of Internet Use for Social Interaction**



Figure P1.   Frequency of Internet use to interact with others.

**Use of the Internet to Participate in Social Interactions**

| | | Frequency | Valid % | Cumulative % |
|---|---|---|---|---|
| Use Internet to Meet New People | Never | 129 | 83.2 | 83.2 |
| | Seldom | 13 | 8.4 | 91.6 |
| | Sometimes | 4 | 2.6 | 94.2 |
| | Frequently | 4 | 2.6 | 96.8 |
| | Always | 5 | 3.2 | 100.0 |
| Use Internet to Post Questions for Others | Never | 93 | 60.0 | 60.0 |
| | Seldom | 35 | 22.6 | 82.6 |
| | Sometimes | 17 | 11.0 | 93.5 |
| | Frequently | 3 | 1.9 | 95.5 |
| | Always | 7 | 4.5 | 100.0 |
| Answer Questions on the Internet | Never | 100 | 64.9 | 64.9 |
| | Seldom | 27 | 17.5 | 82.5 |
| | Sometimes | 14 | 9.1 | 92.6 |
| | Frequently | 8 | 5.2 | 96.8 |
| | Always | 5 | 3.2 | 100.0 |
| Use the Internet to Interact with Others Having Similar Interests | Never | 91 | 58.3 | 58.3 |
| | Seldom | 29 | 18.6 | 76.9 |
| | Sometimes | 15 | 9.6 | 86.5 |
| | Frequently | 15 | 9.6 | 96.2 |
| | Always | 6 | 3.8 | 100.0 |
| Read Online Postings without Comment (Lurking) | Never | 60 | 38.5 | 38.5 |
| | Seldom | 34 | 21.8 | 60.3 |
| | Sometimes | 37 | 23.7 | 84.0 |
| | Frequently | 20 | 12.8 | 96.8 |
| | Always | 5 | 3.2 | 100.0 |

Table P1.  Frequency rates of various types of social interaction on the Internet.

**Measures of Preference for Face-to-Face or Telephone Communication over Participation in a Virtual Community and Distrust of Other Encountered Online**

| | | Frequency | Valid % | Cumulative % |
|---|---|---|---|---|
| Preference for Face-to-Face or Telephone Communication | No | 56 | 35.7 | 35.7 |
| | Yes | 101 | 64.3 | 100.0 |
| Lack of Trust of People Online | No | 108 | 68.8 | 68.8 |
| | Yes | 49 | 31.2 | 100.0 |

Table P2.  Measures of preference for face-to-face or telephone communication over participation in a virtual community and distrust of individuals encountered online indicate that many respondents trust others, but prefer face-to-face or telephone communications.

**Participation in Virtual Communities for Social Interactions**

| | | Frequency | Valid % | Cumulative % |
|---|---|---|---|---|
| Use Virtual Communities to Participate in Communities of Practice (CoPs) | No | 103 | 65.6 | 65.6 |
| | Yes | 54 | 34.4 | 100.0 |
| Participate in Virtual Communities to Share Information or Expertise | No | 103 | 65.6 | 65.6 |
| | Yes | 54 | 34.4 | 100.0 |
| Participate in Virtual Communities to Ask Questions | No | 102 | 65.0 | 65.0 |
| | Yes | 55 | 35.0 | 100.0 |
| Participate in Virtual Communities to Answer Questions | No | 118 | 75.2 | 75.2 |
| | Yes | 39 | 24.8 | 100.0 |
| Participate in Virtual Communities to Meet New People | No | 152 | 96.8 | 96.8 |
| | Yes | 5 | 3.2 | 100.0 |
| Participate in Virtual Communities to Observe Interactions Without Active Participation (Lurking) | No | 117 | 74.5 | 74.5 |
| | Yes | 40 | 25.5 | 100.0 |

Table P3.  Frequency of participation in virtual communities to partake in various forms of social interactions.

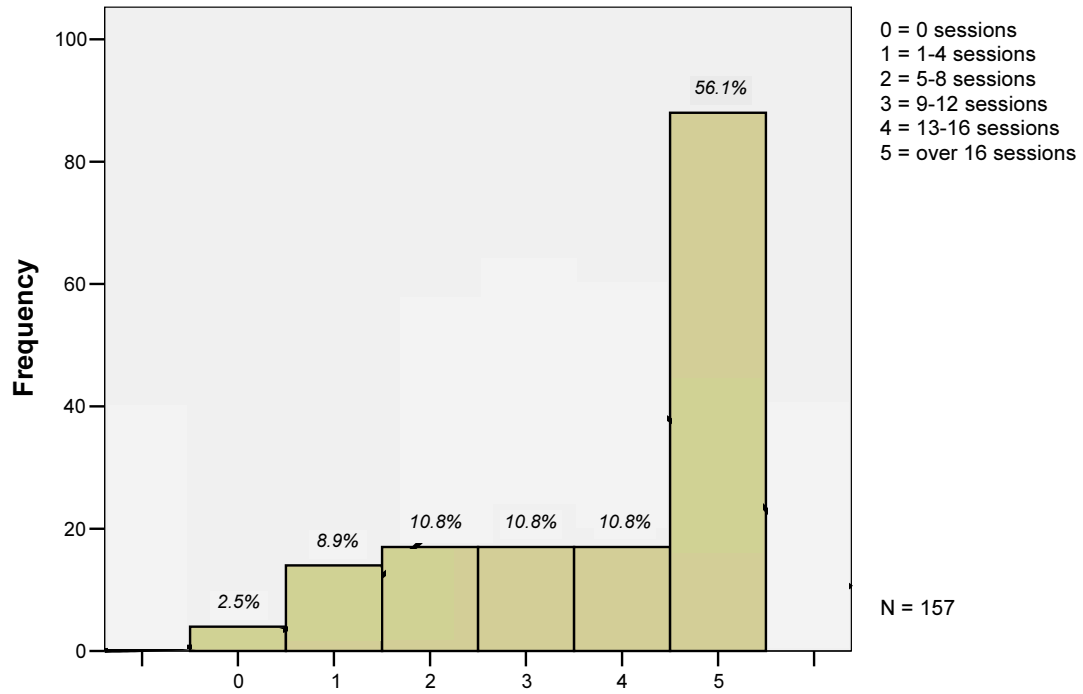# Appendix Q

## Outside Influences

### Monthly Use of E-Mail



Figure Q1.  Frequency distribution of monthly e-mail use.

### Monthly Use of Traditional Internet Sites
### (i.e., excluding virtual communities)

| Sessions per Month | Frequency | Valid % | Cumulative % |
|---|---|---|---|
| 0 | 11 | 7.1 | 7.1 |
| 1 – 4 | 36 | 23.4 | 30.5 |
| 5 – 8 | 42 | 27.3 | 57.8 |
| 9 – 12 | 22 | 14.3 | 72.1 |
| 13 – 16 | 11 | 7.1 | 79.2 |
| over 16 | 32 | 20.8 | 100.0 |

Table Q1.  Frequency of monthly use of Internet sites other than e-mail, e-commerce, asynchronous discussion, chat, databases, and blogs, and excluding virtual communities.

**Monthly Use of Blogs**



0 = 0 sessions
1 = 1-4 sessions
2 = 5-8 sessions
3 = 9-12 sessions
4 = 13-16 sessions
5 = over 16 sessions

N = 155
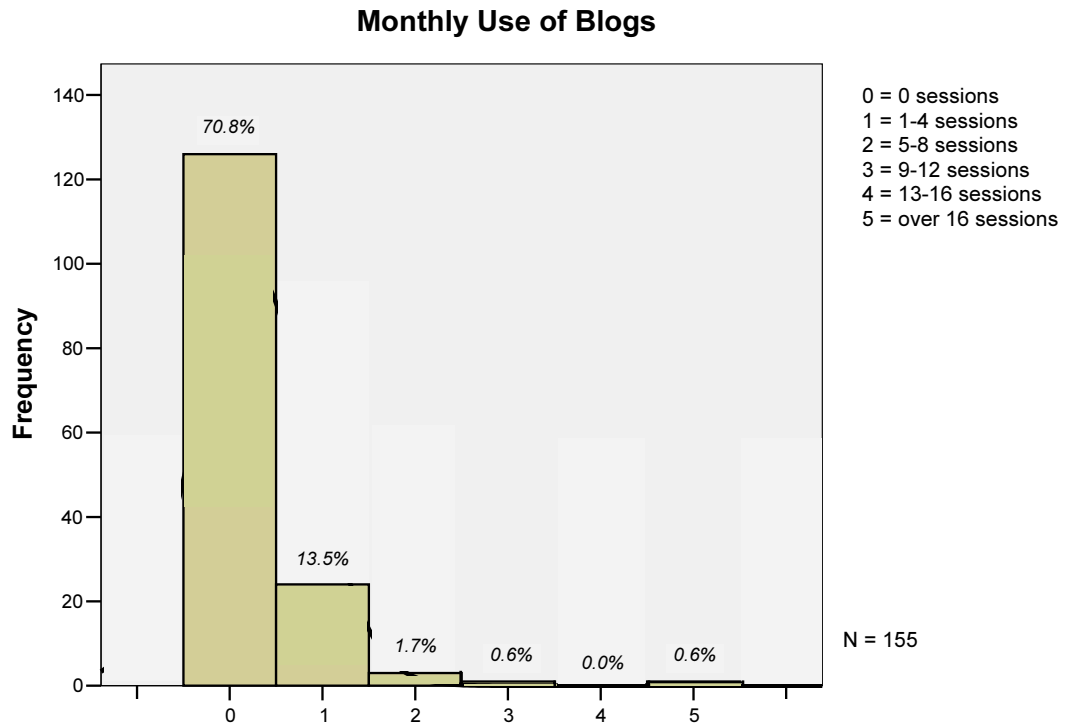
Figure Q2.  Frequency distribution of blog use per month shows that very few use this form of CMC.

**Monthly Use of Chat**



0 = 0 sessions
1 = 1-4 sessions
2 = 5-8 sessions
3 = 9-12 sessions
4 = 13-16 sessions
5 = over 16 sessions

N = 157
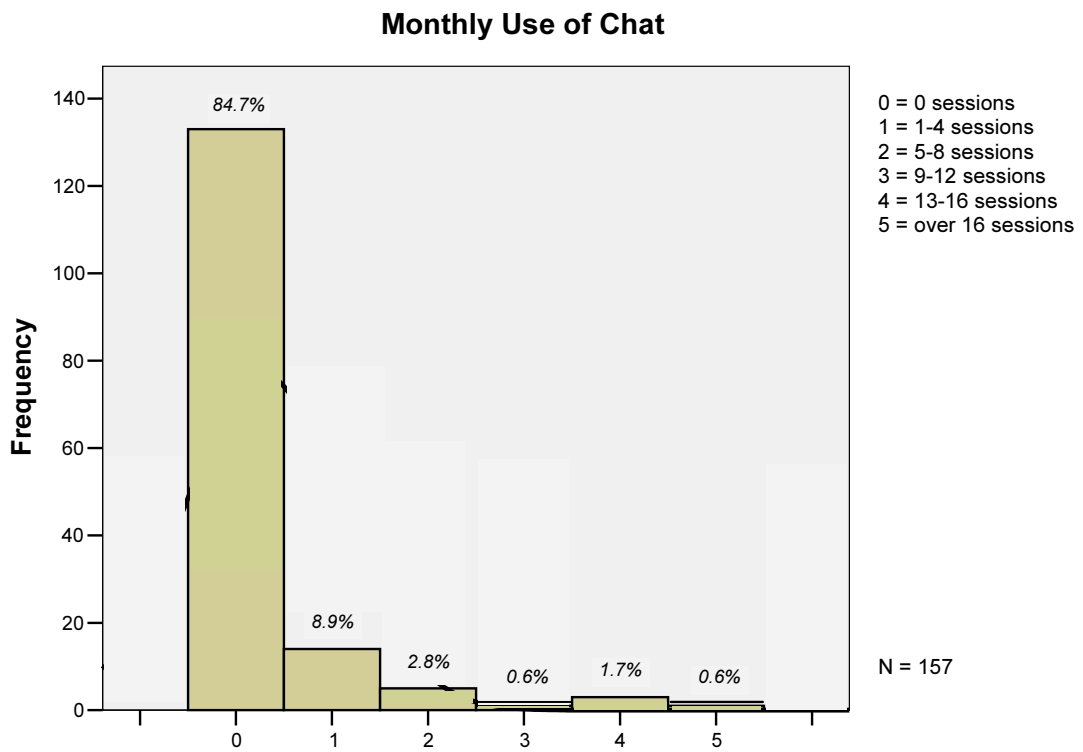
Figure Q3.  Frequency distribution of monthly use of chat.

## Monthly Use of E-Commerce



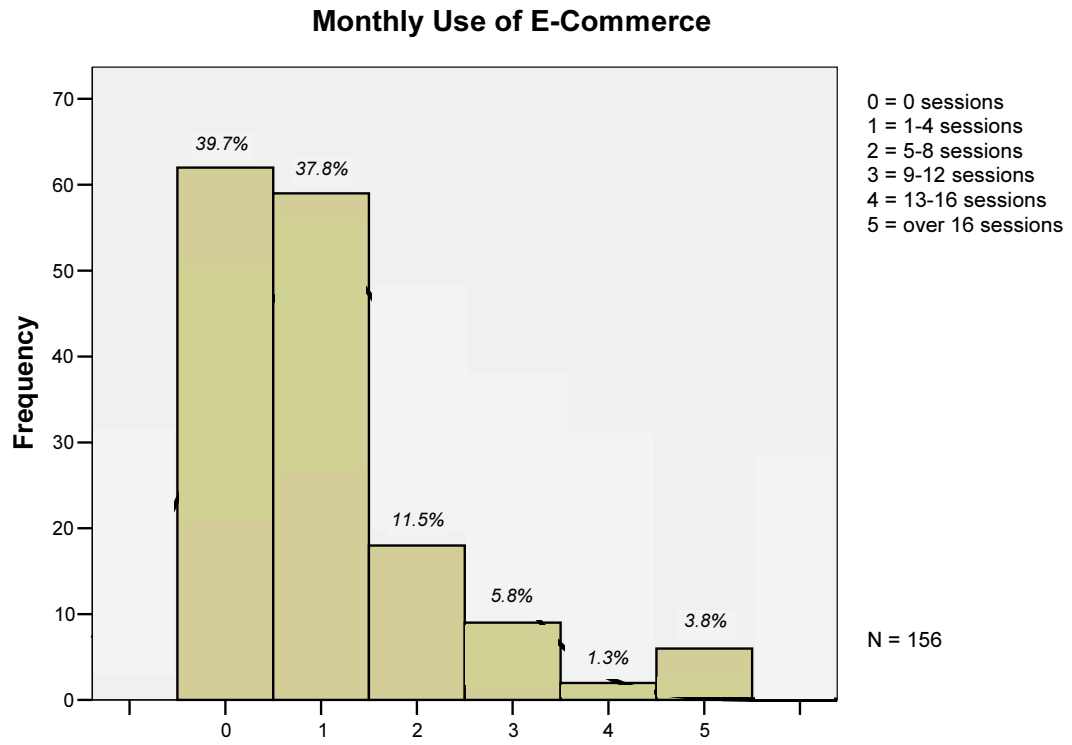Figure Q4.   Frequency distribution of monthly use of e-commerce.

## Monthly Use of Online Databases

| Sessions per Month | Frequency | Valid % | Cumulative % |
|---|---|---|---|
| 0 | 55 | 35.3 | 35.3 |
| 1 – 4 | 75 | 48.1 | 83.3 |
| 5 – 8 | 14 | 9.0 | 92.3 |
| 9 – 12 | 6 | 3.8 | 96.2 |
| 13 – 16 | 4 | 2.6 | 98.7 |
| over 16 | 2 | 1.3 | 100.0 |

Table Q2.   Frequency table of monthly use of online databases.

**Monthly Use of Asynchronous Discussion**



0 = 0 sessions
1 = 1-4 sessions
2 = 5-8 sessions
3 = 9-12 sessions
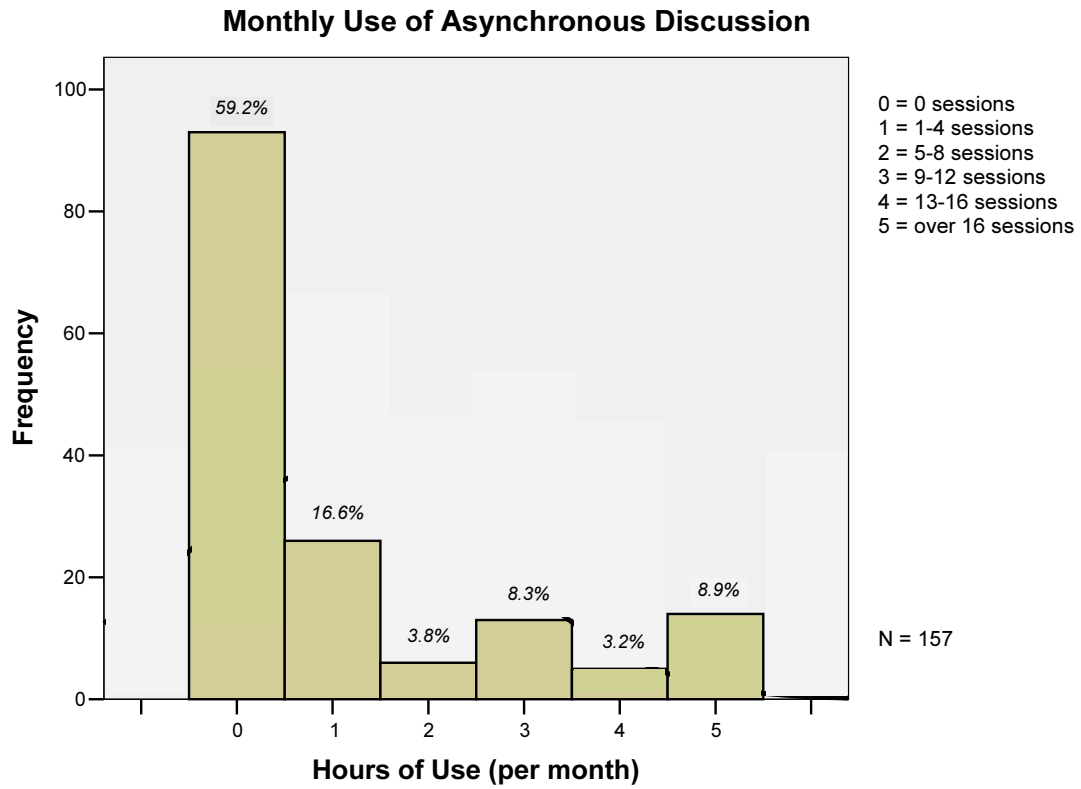4 = 13-16 sessions
5 = over 16 sessions

N = 157

Figure Q5.  Frequency distribution of monthly use of asynchronous discussions.

**Work and Work-Related Activities**

|  | Work/Employment Activities (per week) | | Work-Related Activities (per week) | |
|---|---|---|---|---|
|  | Count | Percent | Count | Percent |
| 0 hours | 0 | .0% | 26 | 17.4% |
| 0.1-5.0 hours | 6 | 3.9% | 98 | 65.8% |
| 5.1-10.0 hours | 4 | 2.6% | 15 | 10.1% |
| 10.1-20.0 hours | 5 | 3.2% | 5 | 3.4% |
| 20.1-30.0 hours | 20 | 12.9% | 2 | 1.3% |
| 30.1-40.0 hours | 36 | 23.2% | 2 | 1.3% |
| 40.1-50.0 hours | 43 | 27.7% | 1 | .7% |
| over 50.0 hours | 41 | 26.5% | 0 | .0% |

Table Q3.  Most educators work more than 20.0 hours per week plus a majority participate up to an additional 5.0 hours in work-related activities each week.

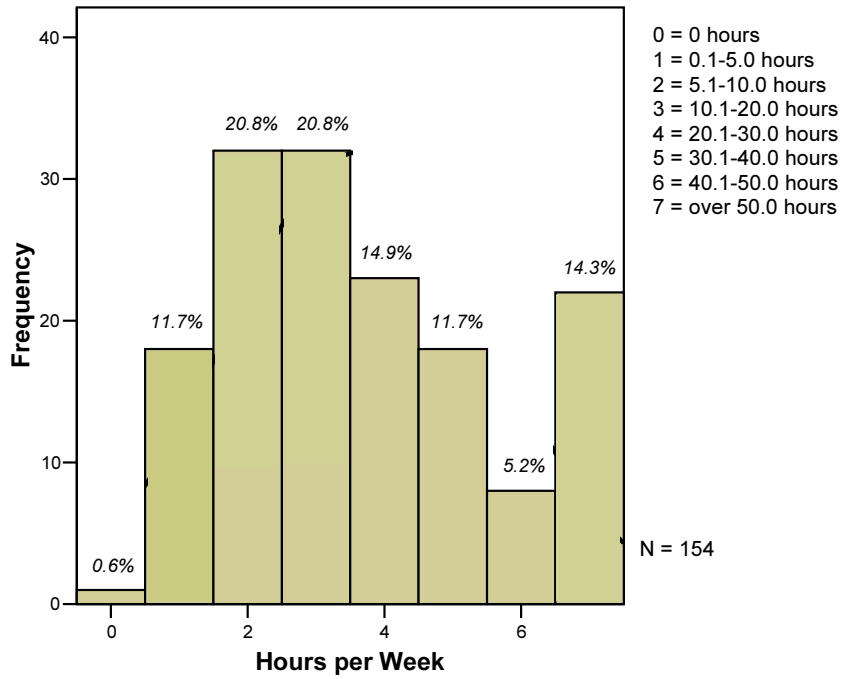**Family-Related Activities (per week)**



Figure Q6.  A low number of respondents indicating no family-related activities means that almost every member of the sample is influenced by this factor.

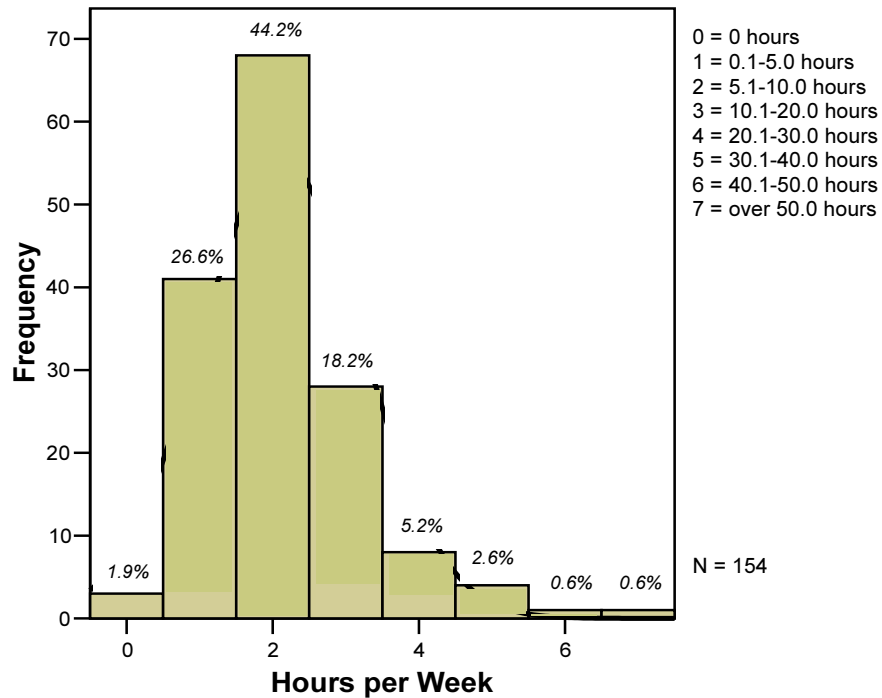**House- and Yard-Work Activities (per week)**



Figure Q7.  Again, with only 1.9% indicating no participation in house and yard-work activities, this factor influences almost all of the sample members.

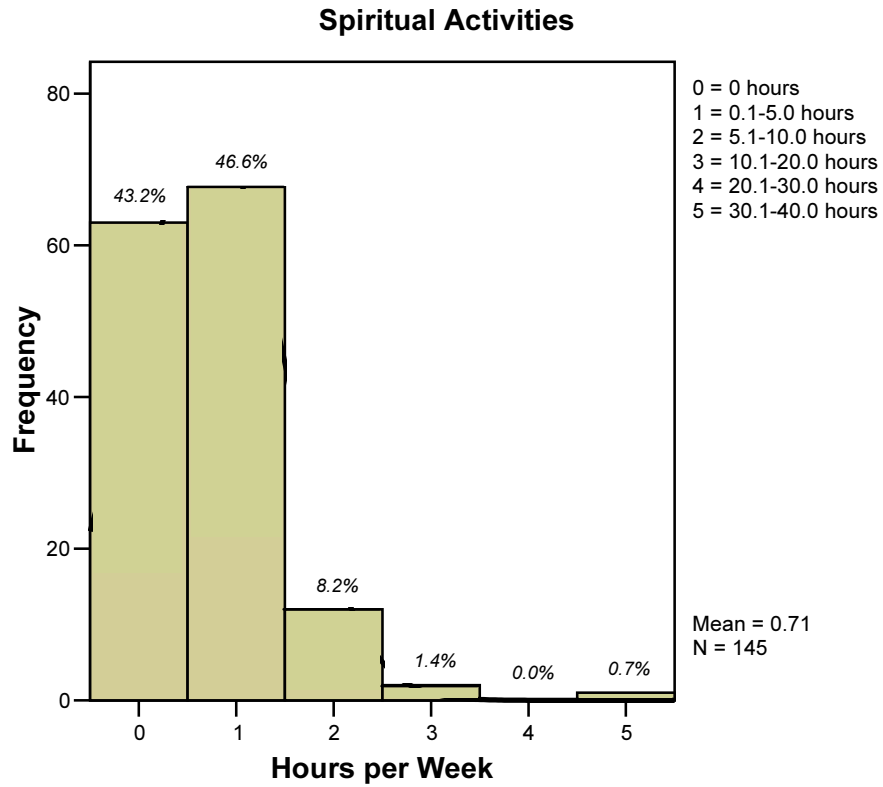**Spiritual Activities**



Figure Q8.  A large number of respondents do not participate in spiritual activities and those that do generally spend less than 10 hours per week doing so (most spend less than 5).

**Volunteer Activities**
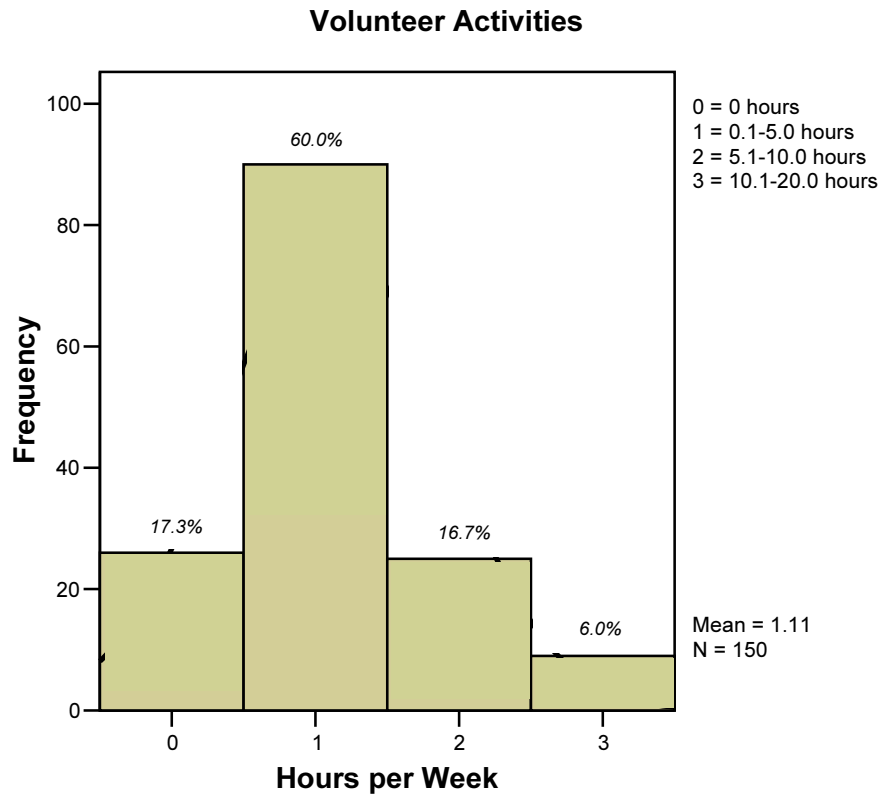


Figure Q9.  Most educators spend up to 5 hours per week participating in volunteer activities. This rate is higher than the rate of participation in spiritual activities

**Personal Education Activities**



Figure Q10. Most educators participate in personal education activities with many participating up to 20.0 hours per week. This rate is slightly higher than participation in volunteer activities.

**Social Activities**



Figure Q11. Almost all educators participate in social activities each week.

**Sports Activities**



```
0 = 0 hours
1 = 0.1-0.5 hours
2 = 5.1-10.0 hours
3 = 10.1-20.0 hours
4 = 20.1-30.0 hours
5 = 30.1-40.0 hours
```

Mean = 1.81
N = 152
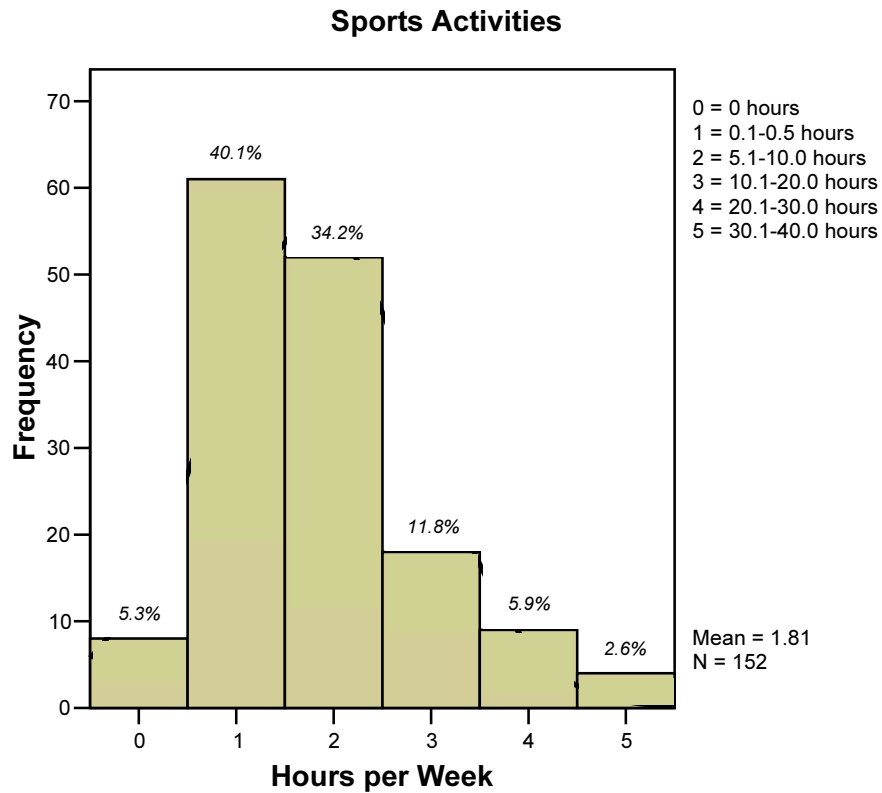
Figure Q12. Although slightly more participate in social activities than in sports activities, those who do participate in sports do so for longer period of time.
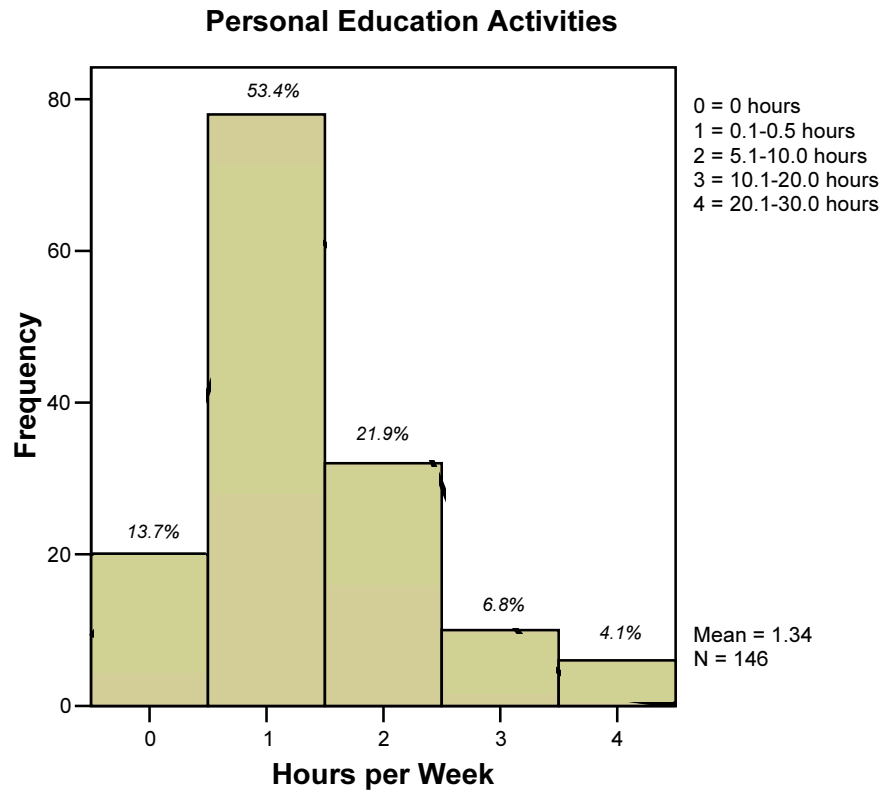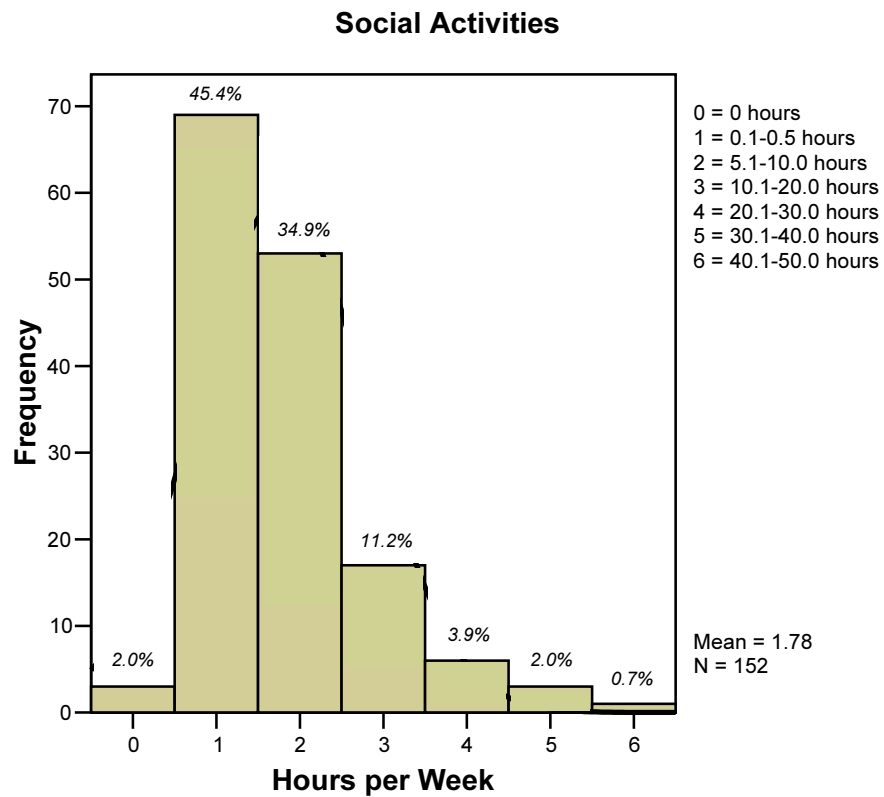
**Time Used By Non-Internet Outside Influences**

| Activity | Mode | Average | Cumulative Hours |
|---|---|---|---|
| Work | 40.1-50.0 | 45.55 | 45.55 |
| Work-related | 0.1-5.0 | 2.55 | 48.1 |
| Family-related | 5.1-20.0 | 12.55 | 60.65 |
| House & yard-work | 5.1-10.0 | 7.55 | 68.20 |
| Spiritual | 0.1-5.0 | 2.55 | 70.75 |
| Volunteer | 0.1-5.0 | 2.55 | 73.30 |
| Personal Education | 0.1-5.0 | 2.55 | 75.85 |
| Social | 0.1-5.0 | 2.55 | 78.40 |
| Sports | 0.1-5.0 | 2.55 | **80.95** |

80.95/112 = **72.3%** (8 hours sleep)

80.95/140 = **57.8%** (4 hours sleep)

Table Q4. Even without considering regular daily activities such as eating, commuting, shopping, personal care, etc. the amount of time that educators have to participate in virtual communities is limited and may be zero for some.

# Appendix R

# Levels Comfort With, Access To, and Use of Technology and the Internet

**Crosstabulation: Comfort Using the Internet with Employment Classification**

| I Am Comfortable Using the Internet | | Employment Classification | | | | Total |
|---|---|---|---|---|---|---|
| | | District-level personnel | Administrators | Teachers | Teachers-on-call | |
| Don't know | Count | 0 | 0 | 1 | 0 | 1 |
| | % within Employment Classification | .0% | .0% | .8% | .0% | .6% |
| | % of Total | .0% | .0% | .6% | .0% | .6% |
| Strongly disagree | Count | 0 | 0 | 1 | 0 | 1 |
| | % within Employment Classification | .0% | .0% | .8% | .0% | .6% |
| | % of Total | .0% | .0% | .6% | .0% | .6% |
| Disagree | Count | 0 | 1 | 7 | 0 | 8 |
| | % within Employment Classification | .0% | 8.3% | 5.5% | .0% | 5.1% |
| | % of Total | .0% | .6% | 4.5% | .0% | 5.1% |
| Neither agree nor disagree | Count | 0 | 0 | 13 | 1 | 14 |
| | % within Employment Classification | .0% | .0% | 10.2% | 7.1% | 9.0% |
| | % of Total | .0% | .0% | 8.3% | .6% | 9.0% |
| Agree | Count | 1 | 4 | 61 | 7 | 73 |
| | % within Employment Classification | 33.3% | 33.3% | 48.0% | 50.0% | 46.8% |
| | % of Total | .6% | 2.6% | 39.1% | 4.5% | 46.8% |
| Strongly agree | Count | 2 | 7 | 44 | 6 | 59 |
| | % within Employment Classification | 66.7% | 58.3% | 34.6% | 42.9% | 37.8% |
| | % of Total | 1.3% | 4.5% | 28.2% | 3.8% | 37.8% |
| Total | Count | 3 | 12 | 127 | 14 | 156 |
| | % within Comfort Using the Internet | 1.9% | 7.7% | 81.4% | 9.0% | 100.0% |

Table R1. Crosstabulation showing association between comfort using the Internet and employment classification At all levels, the comfort-level is high (range = 82.6%-100.0%).

**Comfort Using the Internet by Employment Classification**
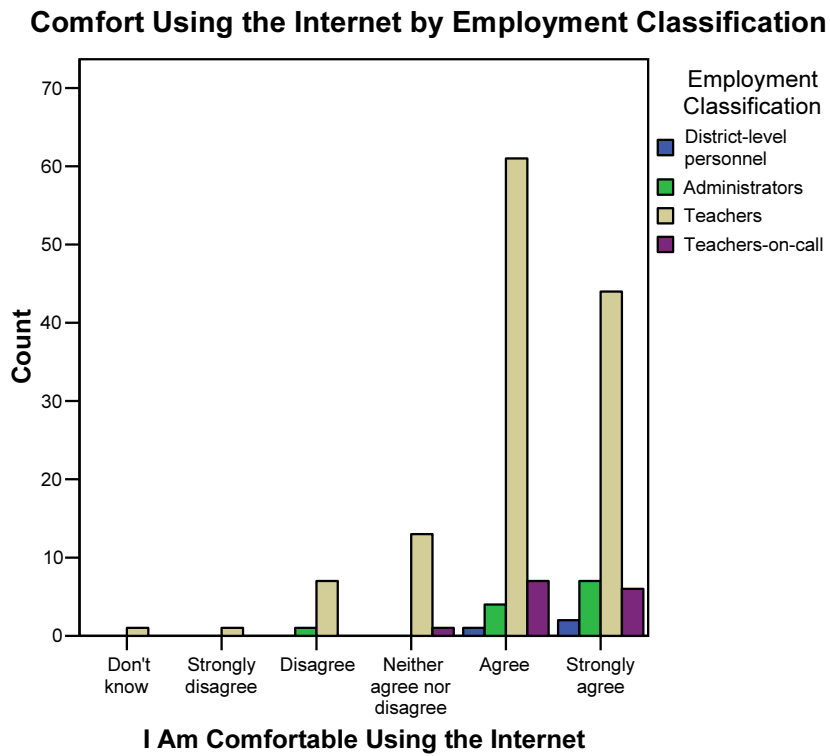


Figure R1. Graphical representation of the distribution of employment classes over comfort using the Internet showing the wide spread of *teacher* responses compared to other classifications.

**Comfort Using the Internet by Age**
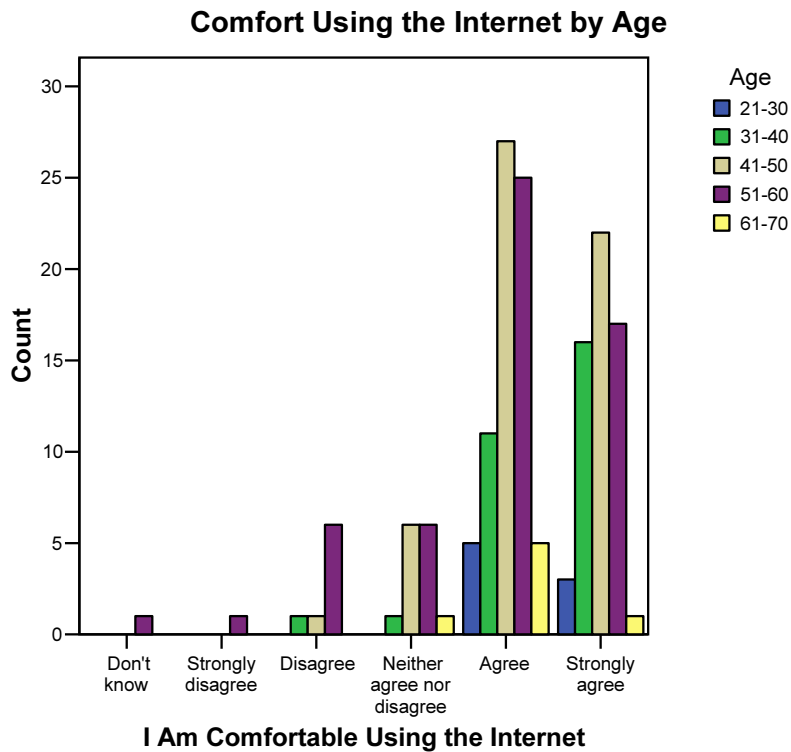


Figure R2. Graphical representation of distribution of age over comfort using the Internet showing the high-level of comfort within the 21 -30 age group as well as high numbers of individuals who are comfortable within the 41-50 year category.

**Crosstabulation: Association of Comfort Using the Internet with Age**

| I Am Comfortable Using the Internet | | Age | | | | | Total |
|---|---|---|---|---|---|---|---|
| | | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | |
| Don't know | Count | 0 | 0 | 0 | 1 | 0 | 1 |
| | % within Age | .0% | .0% | .0% | 1.8% | .0% | .6% |
| | % of Total | .0% | .0% | .0% | .6% | .0% | .6% |
| Strongly disagree | Count | 0 | 0 | 0 | 1 | 0 | 1 |
| | % within Age | .0% | .0% | .0% | 1.8% | .0% | .6% |
| | % of Total | .0% | .0% | .0% | .6% | .0% | .6% |
| Disagree | Count | 0 | 1 | 1 | 6 | 0 | 8 |
| | % within Age | .0% | 3.4% | 1.8% | 10.7% | .0% | 5.1% |
| | % of Total | .0% | .6% | .6% | 3.8% | .0% | 5.1% |
| Neither agree nor disagree | Count | 0 | 1 | 6 | 6 | 1 | 14 |
| | % within Age | .0% | 3.4% | 10.7% | 10.7% | 14.3% | 9.0% |
| | % of Total | .0% | .6% | 3.8% | 3.8% | .6% | 9.0% |
| Agree | Count | 5 | 11 | 27 | 25 | 5 | 73 |
| | % within Age | 62.5% | 37.9% | 48.2% | 44.6% | 71.4% | 46.8% |
| | % of Total | 3.2% | 7.1% | 17.3% | 16.0% | 3.2% | 46.8% |
| Strongly agree | Count | 3 | 16 | 22 | 17 | 1 | 59 |
| | % within Age | 37.5% | 55.2% | 39.3% | 30.4% | 14.3% | 37.8% |
| | % of Total | 1.9% | 10.3% | 14.1% | 10.9% | .6% | 37.8% |
| Total | Count | 8 | 29 | 56 | 56 | 7 | 156 |
| | % within Comfort Using the Internet | 5.1% | 18.6% | 35.9% | 35.9% | 4.5% | 100.0% |
| | % within Age | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% | 100.0% |
| | % of Total | 5.1% | 18.6% | 35.9% | 35.9% | 4.5% | 100.0% |

Table R2.  Crosstabulation showing association between comfort using the Internet and age.

**Distribution of Lack of Computer Ownership Across Use of E-Mail**
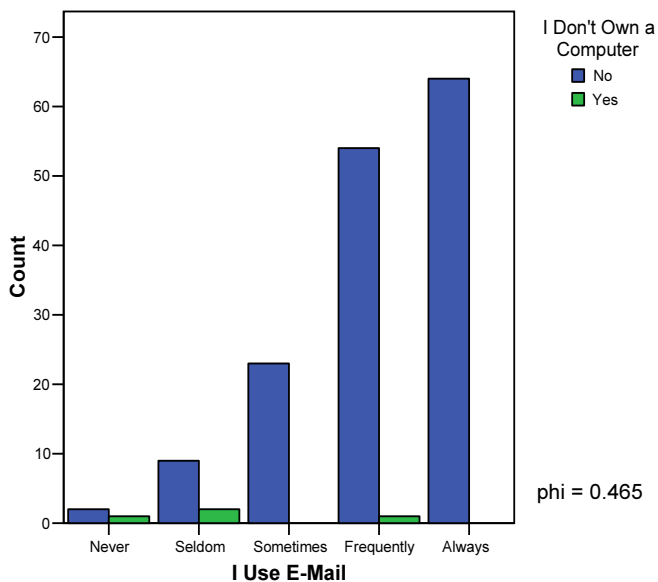
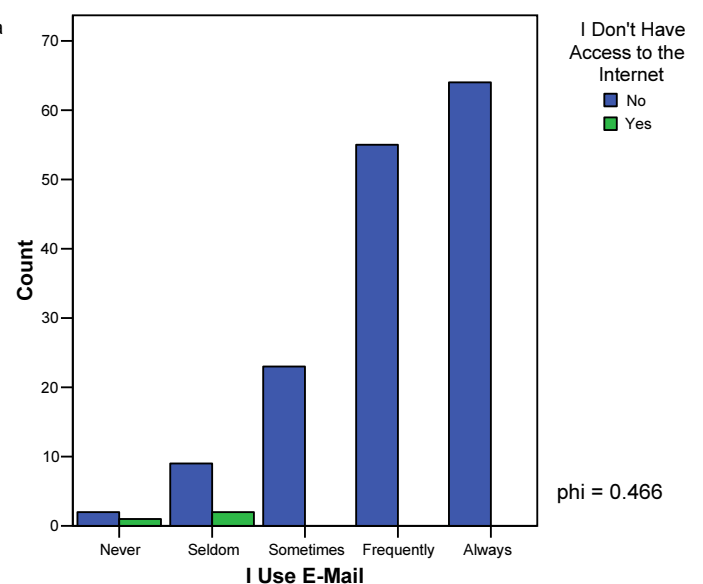**Distribution of Lack of Internet Access Across Use of E-Mail**



Figure R3.  Two bar charts showing the distribution of access to computer technology across e-mail use. The first shows those not owning a computer are almost exclusively distributed among those indicating they *never* or *seldom* use e-mail. The second shows those without Internet access all fall among those who *never* or *seldom* use e-mail.

**Association Between E-Mail Use and Number of E-Mail Sessions per Month**



0 = 0 sessions
1 = 1-4 sessions
2 = 5-8 sessions
3 = 9-12 sessions
4 = 13-16 sessions
5 = over 16 sessions

Spearman Correlation ($r_s$) = 0.714
Kendall's tau-c = 0.537

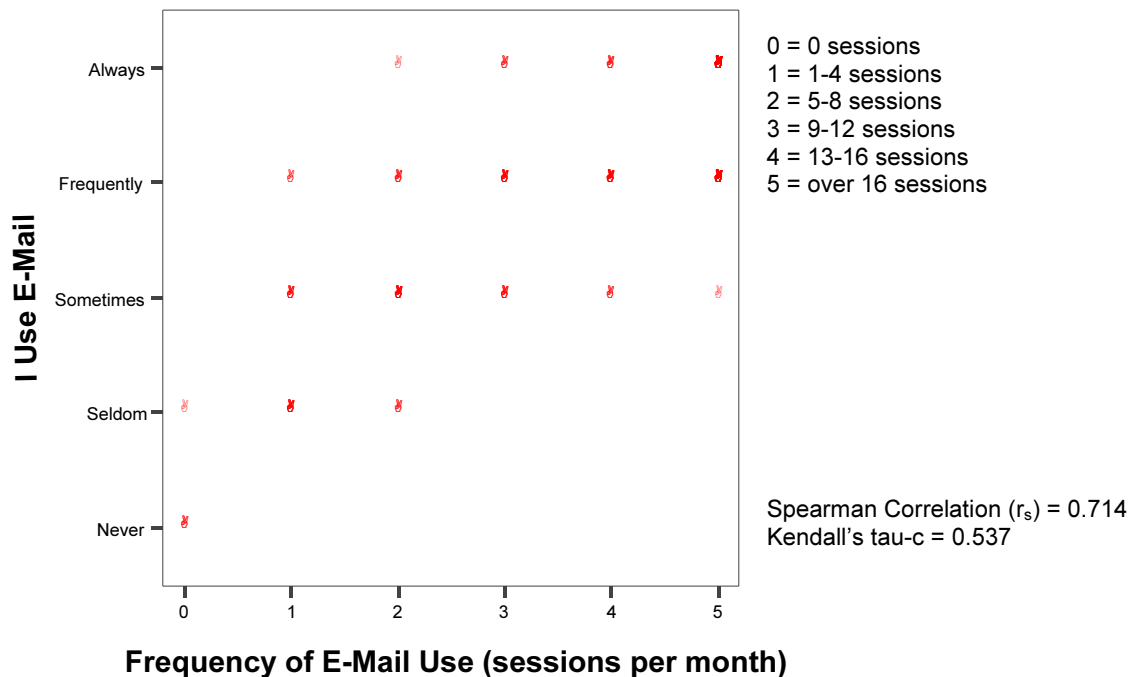**Frequency of E-Mail Use (sessions per month)**

Figure R4.  Strong $r_s$ correlation for association between reporting of general e-mail use and number of e-mail sessions per month provides assurances of the validity of the questions.

**Correlation Coefficients for Association Between**
**Use of E-Mail and Use of Other Forms of CMC**

| Variables | Spearman Correlation | Asymp. Std. Error(a) | Approx. T(b) | Approx. Sig. |
|---|---|---|---|---|
| E-mail Use & Frequency of E-commerce Use | .379 | .069 | 5.059 | .000(c) |
| E-mail Use & Frequency of Asynchronous Discussion Use | .414 | .061 | 5.637 | .000(c) |
| E-mail Use & Frequency of Chat Use | .314 | .057 | 4.099 | .000(c) |
| E-Mail Use & Frequency of Online Database Use | .274 | .074 | 3.519 | .001(c) |
| E-Mail Use & Frequency of Blog Use | .108 | .073 | 1.336 | .184(c) |
| E-Mail Use & Frequency of Other Website Use | .418 | .071 | 5.670 | .000(c) |

a  Not assuming the null hypothesis.
b  Using the asymptotic standard error assuming the null hypothesis.
c  Based on normal approximation.

Table R3.  Correlations between reported e-mail use and frequency of use of other modes of CMC are weak.

# Appendix S

## Measures of Association – Content

**Use Virtual Communities to Find Information About a Topic of Interest Across Current Participation with Virtual Communities**
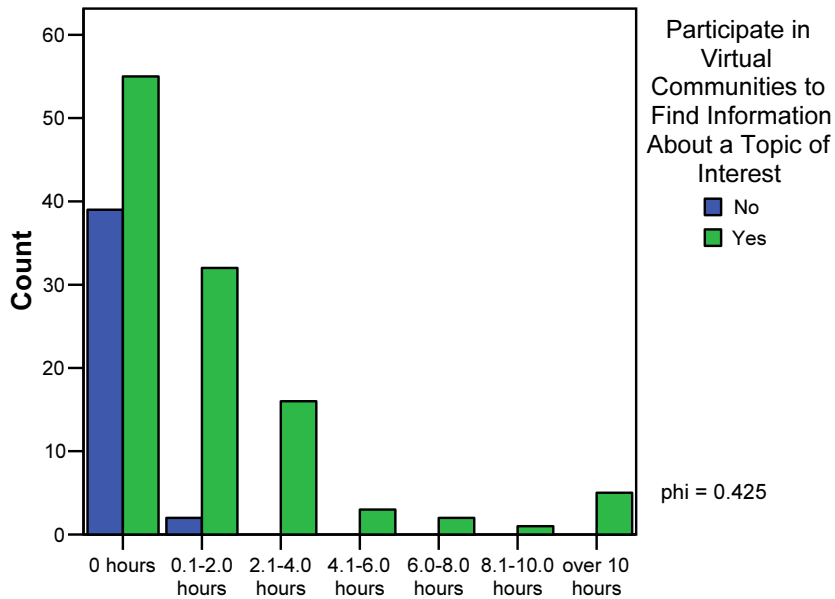


Figure S1.   Use of virtual communities to access information versus current participation rates shows that although levels of participation in virtual communities are currently low, those that do participate regularly (more than 2.0 hours per week) are participating to find information.

**Crosstabulation: Association of Use of the Internet to Access Information and Participation in Virtual Communities to Find Information About a Topic of Interest**

| I Use the Internet to Access Information | | I Do or Would Participate in Virtual Communities to Find Information About a Topic of Interest | | Total |
| --- | --- | --- | --- | --- |
| | | No | Yes | |
| Never | Count | 1 | 0 | 1 |
| | % of Total | .6% | .0% | .6% |
| Seldom | Count | 3 | 6 | 9 |
| | % of Total | 1.9% | 3.8% | 5.8% |
| Sometimes | Count | 11 | 19 | 30 |
| | % of Total | 7.1% | 12.2% | 19.2% |
| Frequently | Count | 19 | 54 | 73 |
| | % of Total | 12.2% | 34.6% | 46.8% |
| Always | Count | 7 | 36 | 43 |
| | % of Total | 4.5% | 23.1% | 27.6% |
| Total | Count | 41 | 115 | 156 |
| | % of Total | 26.3% | 73.7% | 100.0% |

Table S1    A majority of respondents indicate that they do or would use virtual communities to find information.

**Correlation Coefficients for Relationship Between Importance of Visual Appeal and Importance of Graphics and Photos**



| | Value | Asymp. Std. Error(a) | Approx. T(b) | Approx. Sig. |
|---|---|---|---|---|
| Kendall's tau-b | .659 | .053 | 9.160 | .000 |
| Spearman Correlation | .695 | .052 | 12.009 | .000(c) |

a Not assuming the null hypothesis.
b Using the asymptotic standard error assuming the null hypothesis.
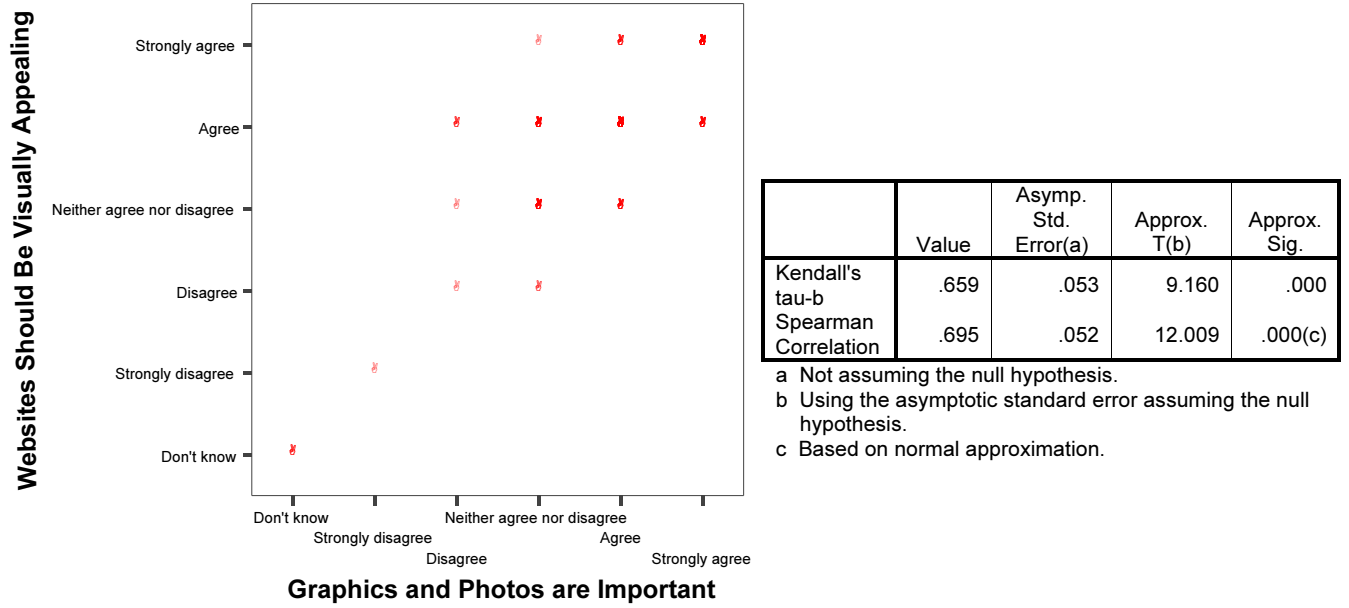c Based on normal approximation.

Figure S2. Scatterplot and correlation coefficients showing a moderately strong, positive relationship between importance of website visual appeal and importance of graphics and photos on websites.
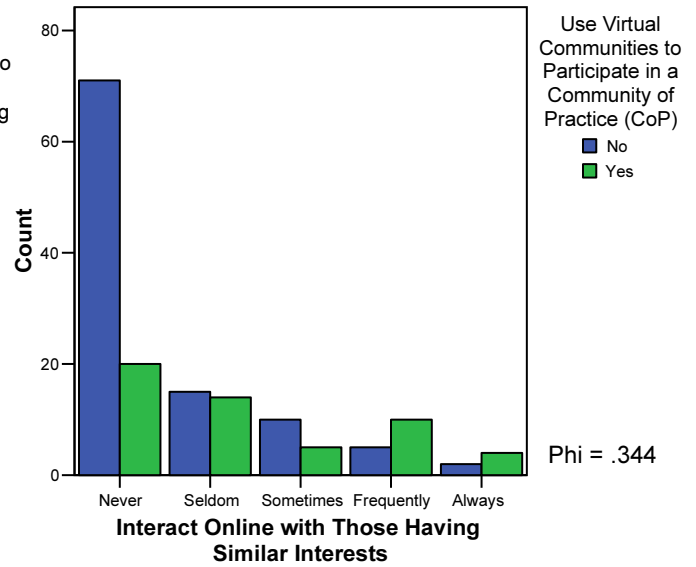
# Appendix T

## Measures of Association – Social Interactions

**Participation in Virtual Communities to Interact with People Having Common Interest(s) and Frequency of Online Interaction with Those Having Similar Interests**
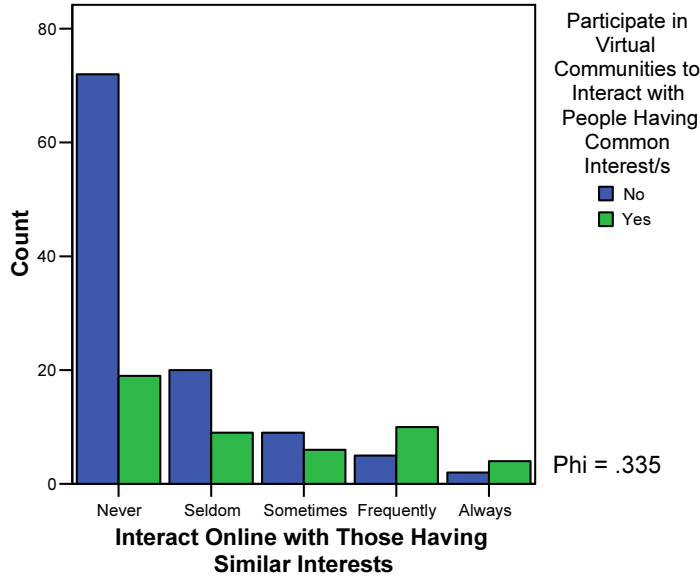


**Participation in Virtual CoPs Across Frequency of Online Interaction with Those Having Similar Interests**



**Participation in Virtual Communities to Share Information or Expertise Across Frequency of Online Interaction with Those Having Similar Interests**
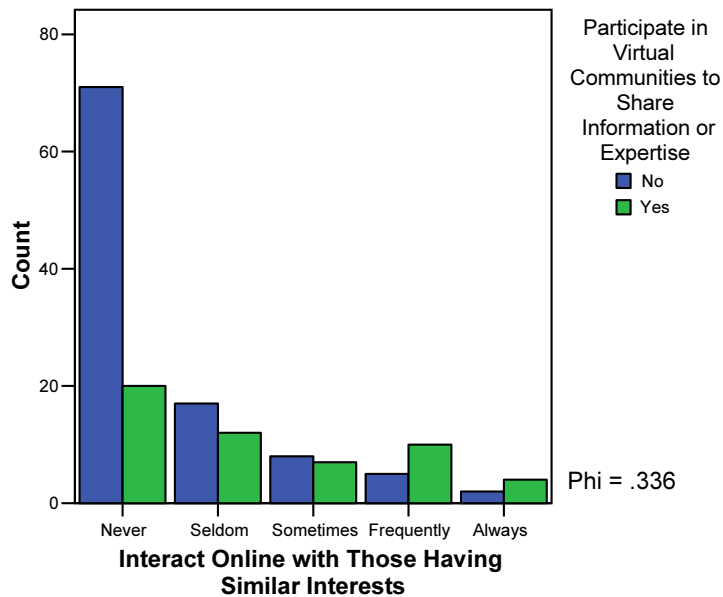


Figures T1 – T3.  Higher rates of participation in virtual communities influence the frequency with which an individual will engage in online interaction with those having similar interests.

**Correlation between Interest-Value of Virtual Communities and Participation in Social Interactions within Virtual Communities**

| | Participation Rate (% of Total) | Phi Value | Approx. Sig. |
|---|---|---|---|
| Interest-value of Virtual Communities and Use to Participate in CoPs | 34.4 | 0.485 | 0.000 |
| Interest-value of Virtual Communities and Observation Without Active Participation (Lurking) | 25.5 | 0.428 | 0.000 |
| Interest-value of Virtual Communities and Participation to Interact with Those Having Common Interests | 31.2 | 0.427 | 0.000 |
| Interest-value of Virtual Communities and Participation to Share Information or Expertise with Others | 34.4 | 0.397 | 0.000 |
| Interest-value of Virtual Communities and Participation to Ask Questions | 35.0 | o.396 | 0.000 |
| Interest-value of Virtual Communities and Participation to Answer Questions. | 24.8 | 0.371 | 0.000 |

Table T1.    Correlation coefficients for participation in various activities within virtual communities that involve social interactions and the interest-value of virtual communities.

**Rate and Correlation between Current Participation in Virtual Communities and Participation in Social Interactions within Virtual Communities**

| | Participation Rate (% of Total Sample) | Phi Value | Approx. Sig. |
|---|---|---|---|
| Current Participation in Virtual Communities and Participation to Ask Questions | 35.5 | 0.396 | 0.000 |
| Current Participation in Virtual Communities and Use of Virtual Communities to Participate in CoPs | 34.8 | 0.461 | 0.000 |
| Current Participation in Virtual Communities and Participation in Virtual Communities to Share Information or Expertise | 34.2 | 0.373 | 0.000 |
| Current Participation in Virtual Communities and Participation in Virtual Communities to Answer Questions | 25.2 | 0.408 | 0.000 |
| Current Participation in Virtual Communities and Observation of Interactions without Active Participation (Lurking) | 25.2 | 0.409 | 0.000 |

Table T2.    Rates of participation in various social interactions within virtual communities and their correlation coefficients.

**Willingness to Participation in Virtual Communities to Ask and Answer Questions**

| | Participation Rate (% of Total Sample) | Phi Value | Approx. Sig. |
|---|---|---|---|
| Willingness to Participate in Virtual Communities to Ask Questions | 35.3 | 0.534 | 0.000 |
| Willingness to Participate in Virtual Communities to Answer Questions | 24.8 | 0.505 | 0.000 |

Table T3.    Correlation coefficients for willingness to participation in virtual communities to ask and answer questions.

# Appendix U

# Measures of Association – Outside Influences

**Association of Usefulness of Virtual Communities and Non-Use of Virtual Communities Due to Other Interests and Hobbies**

| Virtual Communities are Useful | | Don't Use Virtual Communities Because Other Interests and Hobbies Occupy Time | | Total |
|---|---|---|---|---|
| | | No | Yes | |
| Don't know | Count | 14 | 41 | 55 |
| | % within virtual communities are useful | 25.5% | 74.5% | 100.0% |
| | % of Total | 9.0% | 26.3% | 35.3% |
| Strongly disagree | Count | 1 | 9 | 10 |
| | % | 10.0% | 90.0% | 100.0% |
| | % of Total | .6% | 5.8% | 6.4% |
| Disagree | Count | 3 | 11 | 14 |
| | % | 21.4% | 78.6% | 100.0% |
| | % of Total | 1.9% | 7.1% | 9.0% |
| Neither agree nor disagree | Count | 15 | 26 | 41 |
| | % | 36.6% | 63.4% | 100.0% |
| | % of Total | 9.6% | 16.7% | 26.3% |
| Agree | Count | 14 | 12 | 26 |
| | % | 53.8% | 46.2% | 100.0% |
| | % of Total | 9.0% | 7.7% | 16.7% |
| Strongly agree | Count | 9 | 1 | 10 |
| | % | 90.0% | 10.0% | 100.0% |
| | % of Total | 5.8% | .6% | 6.4% |
| Total | Count | 56 | 100 | 156 |
| | % | 35.9% | 64.1% | 100.0% |
| | % of Total | 35.9% | 64.1% | 100.0% |

Table U1. The top two categories of agreement on the usefulness of virtual communities are the only ones in which a majority of respondents indicate that they do *not* have other interests and hobbies than to occupy their time.

**Association of Interest-Value of Virtual Communities and Non-Use of Virtual Communities Due to Other Interests and Hobbies**

| Virtual Communities are Interesting | | Don't Use Virtual Communities Because Other Interests and Hobbies Occupy Time | | Total |
|---|---|---|---|---|
| | | No | Yes | |
| Don't know | Count | 13 | 37 | 50 |
| | % within virtual communities are interesting | 26.0% | 74.0% | 100.0% |
| | % of Total | 8.3% | 23.6% | 31.8% |
| Strongly disagree | Count | 2 | 8 | 10 |
| | % | 20.0% | 80.0% | 100.0% |
| | % of Total | 1.3% | 5.1% | 6.4% |
| Disagree | Count | 3 | 14 | 17 |
| | % | 17.6% | 82.4% | 100.0% |
| | % of Total | 1.9% | 8.9% | 10.8% |
| Neither agree nor disagree | Count | 16 | 29 | 45 |
| | % | 35.6% | 64.4% | 100.0% |
| | % of Total | 10.2% | 18.5% | 28.7% |
| Agree | Count | 13 | 13 | 26 |
| | % | 50.0% | 50.0% | 100.0% |
| | % of Total | 8.3% | 8.3% | 16.6% |
| Strongly agree | Count | 9 | 0 | 9 |
| | % | 100.0% | .0% | 100.0% |
| | % of Total | 5.7% | .0% | 5.7% |
| Total | Count | 56 | 101 | 157 |
| | % | 35.7% | 64.3% | 100.0% |
| | % of Total | 35.7% | 64.3% | 100.0% |

Table U2.   The top category of agreement on the interest-value of virtual communities is the only one in which all respondents indicate the do *not* have other interests and hobbies to occupy their time.