Theoretical bases of Understanding Blended Learning and Instructional Design

by

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Abstract

The purpose of this research is to explore how to optimize the quality of the design of a blended learning experience. This research started as an evaluation of the effectiveness of the design of instructional hypermedia. However, a preliminary review brought out the need to study the larger context of preservice teachers´ blended learning experiences. The theoretical framework of this research explored the context, purpose and expected key characteristics of a blended delivery experience based on: educational and developmental psychology; educational technology; instructional design; learning theory; media ecology; and selected philosophies of education. Developing a design-based development methodology this research articulates a heuristic statement of design principles to examine the development of a preservice teachers´ learning experience and evaluate the quality of such planned intervention.

Preface

This thesis is an original work by Luis Fernando Marin. The research project, of which this thesis is a part, received research ethics approval from the University of Alberta Research Ethics Board, Project Name “Understanding the uses of Hypermedia in Education”, No. Pro00044152, December 16th, 2013.

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CHAPTER 1 ~ Introduction

21st Century Teachers

The 21st Century teacher should be a teacher with the knowledge, skills, and attributes for teaching with newer and emerging technologies; with knowledge and understanding of the intersection and integration of content, pedagogy, and technology in ways that affect student learning positively (Niess, 2008, p. 249). These digital age instructors are expected to design and produce effective multimedia and hypermedia, to be media-competent instructors (Fahy, 2008), to be instructional designers, facilitators of interaction, and subject matter experts (Seok, 2008).

Mass Media

Through animated text, images, and videos it is possible to convey powerful messages: a vast amount of information about human values, styles of thinking, and behaviour patterns is gained from the extensive modeling in the symbolic environment of the mass media (Bandura, 2001). Because the symbolic environment occupies a major part of people's everyday lives, much of the social construction of reality and shaping of public consciousness occurs through electronic acculturation (2001). Traditional mass media conforms to the needs and interests of privileged sectors by means of the five interacting and symbiotic filters of propaganda: profit oriented forces, advertising licenses, media survival dependent on specific news sources, criticism from mass media powers and their clients, and an ideological quest against an ideological enemy (Herman & Chomsky, 1990). In contrast with our direct lived experiences, the more we

depend on the vicarious experiences of the media´s symbolic environment the more our images of reality will depend upon it and the larger its social impact (2001; Ball-Rokeach & DeFleur, 1976). Distorted media versions of social reality can foster shared misconceptions of people, places, and things (Hawkins & Pingree, 1982); and more importantly, they can foster misconceptions of our beliefs in our personal efficacy to control our personal levels of functioning and the events that affect our lives and our social capacity to work together to secure what we cannot accomplish on our own, i.e. our self-efficacy and social self-efficacy (Bandura, 2001).

The Internet has the ability to support and expand the various aspects of social learning, because it blurs the line between producers and consumers of mass media (Brown & Adler, 2008) and because the actions of others can serve as social prompts for previously learned behaviour (Bandura, 1986). Society in the information age can be characterized as a network-based social structure enabled by light-speed operating information technologies (Castells, 1996); it is a global, highly dynamic, open system, susceptible to innovating without threatening its balance (p. 620). The network society represents a qualitative change in the human experience; it is a cultural pattern of social interaction and organization in which the flow of information constitutes the basic thread of social structure (p. 624). However, information becomes disconnected from usefulness (Postman, 1990, 2006) when it turns "into a deluge of chaos," (1990, para. 26) when it does not help us have a coherent conception of ourselves, our universe, and our relation to one another and our world; instead it becomes a commodity that can be bought,

sold, used as a form of entertainment, or worn like a garment to enhance one´s status.

Digital Technology affords us to have relationships with less (Turkle, 2011), to be "tethered and marked absent," to always be elsewhere, present but not present; the experience of the concrete and the virtual simultaneously open up the opportunity to have multiple lives, to cycle through identities composed in compelling environments; we feel we can make more time by multitasking, consuming more information and communicating with speed, creating a new notion of time, with more activities layered onto it but no time to think.

Media and Education

If this Technology has such a powerful inference on society, why not use it for the purposes of Education? (Tickton, 1970). Education, as known in Western civilization, is a consequence of the desire to become an expert or wise person by mastering what there is to know, e.g. beliefs, attitudes, and skills beyond spontaneous transmission (Kinsley, 1967); it is the need of a special and enduring effort (i.e. learning), and support (i.e. teaching) to encompass that expertise or wisdom (1967). The purpose of this knowledge or wisdom is to achieve a good living or *eudaimonia* (Carson, 2005a).

There is and has always been considerable difference of opinion of what constitutes a good living (Aristotle & Rackham, 1934). For sophists like Socrates or Plato, a good living entails a virtuous and just life by means of the discovery of an objective universal truth (Plato, Emlyn-Jones, & Preddy, 2013; Plato, &

Shorey, 1935; Plato, Fowler, Lamb, Bury, & Shorey, 1914). For rhetoricians like Gorgias or Protagoras, a good living entails the mastery of a way of doing things or *techné* for a practical successful life with wealth and power (Plato & Lamb, 1925). Aristotle proposed that both virtue and non-moral goods such as wealth and power contributed to or detracted a person from *eudaimonia* (Menn, 2005). A practical wise person should be able to use its subjective understanding to deliberate well about what is contingently good and advantageous for her or himself as a means to an entire life of human flourishing (Carson, 2005b). While objective understanding or propositional knowledge has the potential of helping us predict and control the world around us, subjective understanding or the capacity for making sense of the world relative to our own experience is thought to have more value because: a) it is impossible to understand without understanding one understands, b) it offers a superior, deeper, more profound understanding of the world, and c) because it is an intrinsically satisfying achievement (Grimm, 2012).

Many important educational constructs can be related to the notion of subjective understanding. A deep philosophical reflection, which is beyond the scope of this research, should help categorize these constructs according to the types of understanding promoted (Kanuka & Smith, 2013; Grimm, 2012), please see Figure 1 for a brief overview.

Figure 1 ~ Educational constructs & understanding

Baltes and Smith (2008) described a complex dynamic system of expert knowledge of

human nature and the life course, DeLeeuw and Mayer (2008) a germane deep cognitive processing, Anderson and Krathwohl (2001) a 21st Century higher order thinking, Bateson (2000) an understanding of the cyclical relationships among the self and the world, Boulton-Lewis (1998) a critical thinking, Laurillard (1997) a reflective learning, Maturana and Varela (1992) an enactive making sense of our bringing forth, Resnick (1987) a higher order thinking, Biggs and Collis (1982) an in-depth processing, Vygotsky (1966) higher mental functions, Bloom and Krathwohl (1956) a higher order independent thinking.

The aspiration to achieve a higher understanding is embedded at the core of Education. For example, a goal of the University of Alberta is "the uplifting of the whole people", as said by Henry M. Tory, the first President. In other words, to inspire the human spirit in all of its diverse expressions and wherever it soars (University of Alberta, 2013). Here, to be a professional educator is to continue to question, to reflect, to seek knowledge (UofA, Faculty of Education, 2014), and students are expected to develop critical skills and knowledge (UofA, Department of Educational Psychology, 2014). In Alberta, one of the goals of Education is to enable students to think critically and creatively (Government of Alberta, 2013), and it is thought that technology needs to be leveraged as a means to enhance learner understanding (Alberta Advanced Education and Technology, 2007).

The medium or media, which are extensions of ourselves, shape and control the scale and form of human association and action (McLuhan, 1962, 1964); and constitute an alteration of the environment to provide an affordance (Gibson, 1979). As time has passed, new media, technology and innovations have

shown their capabilities and limitations (Buck, 2009; Fahy, 2008). Technologies have enabled synchronous and asynchronous distance education through correspondence courses, educational radio, instructional television, computer-based learning, audio and video conferencing, and online learning (Anderson, 2008). In distance education, there is always the possibility of occasional face-to-face interactions but the learner is usually separate from the teacher most of the study time and is highly dependent on prepared learning packages: learning materials presented in various media formats such as hypermedia and multimedia e-learning objects that serve as the "professor" (Keegan, 1986). Online learning uses the Internet to access learning materials, interact with the content, instructor, and other learners to acquire knowledge (Ally, 2008).

Blended Learning

The concept of blended learning is not a recent innovation; 19th Century publications used it to denote the fusion of diverse sources of knowledge ("The Juridical Writings", 1836, p. 109), fields of knowledge ("The Straussian Myth", 1845, p. 339), and belief systems (Shields, 1860, p. 62). In the 20th Century, Bell and Margolis (1978) wrote about "Blending Didactic and Experiential Learning Methods;" Coleman and Gallagher (1995) presented the results of blending middle schools or cooperative learning with gifted education; Rieber (1996) proposed to guide the design of interactive multimedia learning environments with the blending of micro worlds, simulations, and games; and Ross (1998) examined the process of blending business and academic goals and requirements in a situated-learning setting.

At the turn of the 21st Century, blended learning came to be known as the integration of the instructor-led and e-learning training paradigms (Zenger & Uehlein, 2001). Myint and Lourdusamy (2003) attempted to deliver a module in a teacher education program using a blended learning approach that combined face-to-face instruction, multimedia viewing and online discussion. Blended learning is an instructional approach that aspires to make the best use of class time to support teaching and learning (UofA Center for Teaching and Learning, 2014, April 4), the thoughtful fusions of face-to-face and online learning experiences (Garrison & Vaughan, 2008), the combination of the effectiveness and socialization opportunities of the classroom with the technologically enhanced active learning possibilities of the online environment (Dzuiban, Harman, & Moskal, 2004). The SLOAN Consortium surveys have discretely categorized the traditional face-to-face vs. online distance education dichotomy according to *the amount of course content delivered online*: traditional (0%), web facilitated (1 to 29%), blended or hybrid (30 to 79%), and online (80 to 100%) (Allen, Seaman, & Garret, 2007, p. 5). Blended learning has been enabled by an emphasis on student-centered pedagogy, the widespread adoption of the Internet, the World Wide Web, and personal computers, and learning theories such as social constructivism (Dzuiban, Harman, & Moskal, 2004). The social construction of understanding is a pedagogical approach that has to do with designing evocative knowledge objects and spaces that foster focused conversations which scaffold the students' abilities to construct their own understanding of what the objects are about (Brown & Adler, 2008).

UofA Blended Learning for Teacher Education

At the University of Alberta preservice teachers, i.e. student teachers-in-training (Tinker, 1942; Chatterton, 1941; Suhrie, 1923), get the opportunity to examine the frameworks, trends, issues and futuristic scenarios on the role of technology in education through the blended learning course *EDU 210: Introduction to Educational Technology*. EDU 210 is an undergraduate course that examines the frameworks, trends, issues and futuristic scenarios on the role of technology in education (Welch & Fricker, 2013, November). The course is composed of two sections: through Flex Labs students explore and experience the use of technologies for teaching and learning; and with Interactive Lectures students are expected to learn to understand the role of digital technologies within the teaching profession, articulate and select frameworks that guide their use of technology in education, reflect on the conventions and responsibilities of digital citizenship, and begin to develop a philosophy of teaching with technology (2013). Students participate in a weekly face-to-face lecture facilitated by the instructors, can receive face-to-face and online support and workshops from a team of mentors at Digital Teaching, Assessment, and Learning (DigiTAL) (a support group organized and funded by the Faculty of Education formerly known as EdTech Services), and are expected to actively participate in their own learning by interacting with the class content, resources, activities and assessments delivered through eClass, UofA´s centrally supported Learning Management System (LMS) (UofA CTL, 2014, April 17). The researcher redesigned various hypermedia presentations used in the course to include animations, interactive

cues and activities, and participated as a Teacher Assistant during all of the terms included in the scope of this study. This work started as an evaluation of the effectiveness of the design of instructional hypermedia content. However, an initial review of the Literature revealed that the hypermedia content should not only be analyzed for its properties, but as part of the larger context of the blended learning experience.

The Learning Process

The blended learning experience, the interactions between students and instructors, involve at least the following five general processes: a) The previous knowledge and motivations of the student or Active Learning 1, b) the instructional design and production of the learning experience or Teaching 1, c) the student's interactions with the learning experience or Active Learning 2, d) the formative and summative assessment of the student´s interactions or Teaching 2, and e) the student´s interaction with the assessment of its learning and presumably the consolidation of its new set of knowledge and understanding or Active Learning 3. During a course, this experience would be repeated recursively in accordance with the outline. When the students start a new iteration (e.g. a new module), they engage it with a renewed set of previous knowledge and motivations, an Active Learning 1b, c, etc. For example, EDU210 is organized into twelve modules, i.e. twelve learning experience iterations with their own set of Flex Lab activities and Interactive Lecture resources and activities. The pedagogical and theoretical assumptions and the mediated nature of the blended learning environment establish a set of particular expectations and considerations

for the teachers' and students' participation in the learning experience:

a) The Student ~ Active Learning 1, the psychological and socio-cultural reality of the student provides a historical and complex set of personal resources and motivations that afford and drive the student´s active involvement in the course. Several constructs can help observe some of these students' personal resources: for example, their previous knowledge and expectations (Taylor & Maor, 2000), perceived self-efficacy (Bandura, 1986), self-regulation (Azevedo, Moos, Johnson, & Chauncey, 2010), social capital (Bourdieu as cited in Swartz, 2007) and material resources (e.g. from basic sustenance to electronic devices). The presence or absence of each and all of these may or may not facilitate the student´s learning and understanding. The students´ predispositions for learning, their motivations for attending the course can be many (Wolters, 2003) and even though extrinsic motivations can help modify a person behaviour, it is most desirable to foster the self-reinforcing intrinsic desire to know and understand that active and independent learners have (Seifert, 2004). A skilled teacher takes into consideration all of these internal and external conditions and states of the learner as the starting point of an effective instruction.

b) Instructional Design ~ Teaching 1, in the blended learning model instructors are expected to be designers of active learning environments and more facilitative in their teaching (Dzuiban, Harman, & Moskal, 2004), i.e. less instructive (Papert, 1980). The blended learning environment should provide opportunities to: have intrinsically rewarding experiences, manipulate virtual or real objects, learn by doing (Bers, Ponte, Juelich, Viera, & Schenker, 2002), to

collaborate (Slavkin, 2004: Johnson & Johnson, 2009), observe others (Bandura & Walters, 1963), and to create or express ideas for others (Papert, 1980). The instructional team should attend to certain media principles when designing asynchronous multimedia or hypermedia lectures in order to minimize the possibility of cognitive load (Mayer, 2001). Because the VLE has a diminished capacity to provide personal and emotional information, the instructors should also plan for opportunities to increase the immediacy and social presence of everyone involved in the learning experience (Tanis, 2003; Rourke, Anderson, Garrison, & Archer, 2001; Short, Williams, & Christie, 1976).

c) Studying outcomes ~ Active Learning 2, students in blended learning are expected to incur more responsibility for managing their learning (Dzuiban, Harman, & Moskal, 2004, p.8) and to engage in collaborative learning (Slavkin, 2004; Johnson & Johnson, 2009) to be part of a community of inquiry (Rourke, Anderson, Garrison, & Archer, 2001; Taylor, Maor, & Dougiamas, 2001). In blended learning student-centered learning takes the form of pre-recorded lectures and lists of resources that the student is expected to review consciously and critically, i.e. understand objectively and subjectively. Self-regulation research has shown that students with low self-regulation skills find it very hard to make sense or learn actively on their own (Azevedo, Cromley, Winters, Moos, & Greene, 2005), and that there is no best way to foster the development of such skills than the timely assistance and guidance of a human mentor (Azevedo, Cromley, Moos, Greene, & Winters, 2011). Students are expected to participate in collaborative activities such as virtual discussion forums where they can express

in writing the results of their understanding, observe and interact with their peers' reflections (Jonassen & Rohrer-Murphy, 1999).

d) Scaffolding ~ Teaching 2, as in any Educational activity one of the most important functions of the instructors are expected to provide are formative and summative assessment of the student´s knowledge construction process (Active Learning 2), and status (Active Learning 1). Educators are not only expected to establish the rubrics for summative assessment (Dzuiban, Harman, & Moskal, 2004, p. 7), but should engage in the formative assistance process which educational theorists have described as the contingent control of learning or scaffolding (Bruner, 1986; Vygotsky, 1978), the social facilitation of individual development (Wood, 1991; Rogoff, 1998). Instructors should be aware of the immediacy afforded by their instructional design and the degree of salience of their mediated social presence (Tanis, 2003; Rourke, Anderson, Garrison, & Archer, 2001; Short, Williams, & Christie, 1976).

e) Understanding ~ Active Learning 3, through this last process the active learner is expected to interact, i.e. review and reflect on the formative and summative assessment, maybe question and further research the topic with the purpose of consolidating its new objective and subjective understanding. A recent research of trends in studies of blended learning found that "Learner outcomes" was the most popular research topic, mostly represented by studies of performance and student satisfaction (Drysdale, Graham, Spring, & Halverson, 2013, p. 95). Performance studies usually observe and analyze student's grades or summative assessments. On the most recent blended learning literature, the levels

of student and faculty satisfaction are equivalent to the term assessment. The construct of satisfaction is more administrative if not a political-economic than pedagogical, for example, it is said that "satisfied students create a positive climate by increasing demand and impacting program planning" (Moskal, Dziuban, & Hartman, 2013), and because together with success and withdrawal it proves to be "instrumental in making policy and practice decisions" (2013, p. 18). However, together with performance and satisfaction, blended learning courses should also evaluate the phenomenon of collaboration and the student's subjective understanding. In a blended learning classroom that serves hundreds of students this evaluation will necessarily need to be mediated by the machine, by the computer.

Technology

More than half a century ago, in an article that inspired many of the technological innovations that help bring forth the everyday world of today, Vannevar Bush (1945), then Director of the US Office of Scientific Research and Development, advocated to redirect the purpose of science towards inventions that could "extend the powers of the human mind," (p. 1) to give access to and command over the powers of the mind. He envisioned the solution would come from allowing the human to concentrate on creative thought processes while relegating repetitive thought processes, laborious detailed manipulation of data, higher mathematics and other complex computations, to advanced arithmetical logic machines, i.e. the computer (pp. 6-8).

Technology nowadays affords massive collection of data and advanced

computational analyses that can extend the powers of the teachers and students minds. Because of the computer mediated nature of the LMS most of the interactions between students, peers, instructors, and the content in the VLE can be tracked, collected and analyzed. When the blended learning experience unfolds for hundreds of students these data become indispensable for the processes of learning. In recent years, the average enrolment of EDU210 has been close to 300 students and through eClass it is possible to request opinions (e.g. satisfaction surveys) and collect data related to the time (e.g. vs. class schedule, other students), place (e.g. in or out of the University via IP address), content (e.g. text numeric, semantic, and content analysis), and direction of every interaction (e.g. between peers, instructors, and groups). The capabilities of wearable devices and other types of technologies could afford the collection of additional layers of information such as bio data, e.g. heart rate, eye movement, or neuro-electrical impulses which are already in use in the lab (e.g. Mayer & Moreno, 2003; McCulloch & Pitts, 1990), but to collect and use this information as part of the learning process would necessarily require the solution of many ethical and legal issues, and the prevention of any potential physical, psychological, emotional, or social risks or discomforts that could disrupt instead of facilitating learning.

Effectiveness

All these computational affordances (Gibson, 1979), what the computational environment offers, provides or furnishes for the good or ill of the person, i.e. the complementarity of the persons, the computer and the latest advances in Artificial Intelligence, and the field of Educational Psychology should

allow the creation of indicators for the measurement of the following key blended learning constructs: a) **satisfaction**, i.e. perceptions or opinions (Owston, York, & Murtha, 2013); b) **performance**, i.e. summative assessment or grades (2013); c) **collaboration**, e.g. collaboration indices (Jahng, 2013; & Nielsen, & Chan, 2010), group dysfunction (Nadler & Ancona, 1992), interactions (Burri, Naujard, & Etter, 2006), social networks (Reffay & Martínez-Monés, 2013), opinion leaders (Li & Du, 2011), group cohesiveness (Jacques, 2003; & Salmon, 2007), normative social influence (Asch, 1951, 1956, 1966), or pro-social behaviours (Gentile *et al*, 2009); and most importantly, d) **understanding**, e.g. protocols for forum content analysis (Marra, Moore, & Klimczak, 2004; Azevedo, Reategui, & Behar, 2010), cognitive maps (Kitchin, 1994), cognitive load (Deleeuw, & Mayer, 2008; Sweller, 2012), self-regulation (Zimmerman 1986, 2008; & Labuhn, 2012), or even stress (Koolhaas, Bartolomucci, Buwalda, de Boer, Flügge, Korte, & Fuchs, 2011; Le Moal, 2007). Based on the data collected the computation of these constructs could be used to harness the learning experience of hundreds or thousands of students. Through data mining techniques and these constructs it could be possible to create sub audiences, i.e. students with similar profiles or needs for assistance, instructional adjustments, or contextualized communications for an increased sense of social presence. When delegating this fundamental teaching responsibility to the machine or to other humans, instructional designers should keep in mind the purpose of facilitating deep understanding.

Purpose of the Study

This work started as an evaluation of the effectiveness of the design of instructional hypermedia content. The researcher redesigned various hypermedia presentations of a blended delivery course to include animations, interactive cues and activities, and participated as a Teaching Assistant during all of the terms included in the study. A preliminary review of the literature brought out the need to study the larger context of the blended learning experience since, as it is argued, course design and pedagogy are more important than media.

The researcher´s long term interest is to realize how to observe the key learning constructs of understanding and collaboration through the data collected from the LMS in order to define how important are each of the learning activities for understanding and collaboration, and to observe how do changes in the design of instruction change the levels of understanding and collaboration. Hypothetically, it should then be possible to observe the diverse patterns of student´s online activity; compare such activity with the expected patterns, the ideal learning paths; and evaluate the structure and contents of the learning activities, e.g. the hypermedia instructional aides, and their effectiveness in the learning process in terms of collaboration and understanding.

It is then essential to better understand what characteristics constitute an optimized guided intervention, i.e. what is good teaching, and where, when, how, for what purpose, and for whom can it be said that good teaching happened in the context of a blended learning higher education course. These guided interventions involve a set of processes which start with a learner and a designed instruction,

i.e. a planned intervention, followed by the performed acts of the teaching and learning interactions. Given this context and the resources available, the researcher decided to initiate this long-term effort by studying the characteristics of the learners and the design of instruction, and thus addressed the following:

Research Questions

1. How to optimize the quality of the design of a learning experience?
    1.1. What is the context of the intended learning, and what ought to be its purpose?
    1.2. Which are the key characteristics the learning experience ought to have*?*
    1.3. What is meant by the quality of a design*?*

CHAPTER 2 ~ Theoretical Framework

The student

Psychology explains that we as human beings have the ability to perceive, feel and think (Butler & McManus, 2000). We perceive our environments through an active process that involves sensing, interpreting, and attending; our emotional reactions and motivations influence how we perceive and think about our environments; we learn and are fascinated with contingencies, discrepancies, and transactions in our environments; we consciously and unconsciously think or simplify and summarize these experiences into abstractions, we reason about these abstractions, and these experiences and their meanings stay with us; and we act or communicate upon our environments based on our emotions and cognitions.

A skilled teacher takes into consideration the internal and external conditions and states of the learner as the starting point of an effective instruction (Roehrig, Turner, Arrastia, Christensen, McElhaney, & Jakiel, 2012; Wood, 1991). A continuum of different possible teaching practices will result from different concepts of the learner, of the role of experience, of the readiness to learn, and of the orientation to learning (Knowles, 1980). One extreme of such continuum assumes the learner is dependent, that experience is of little worth, that education should be transmitted by experts, texts, lectures, or audio visual presentations, that people of the same age are ready to learn the same things or standardized curriculum, and that learning is the process of acquisition of subject-matter content (1980, pp. 43-44). The other extreme of the continuum assumes the

learner to be self-directed, that previous experience is a rich resource for learning, that people need to experience a need to know, and that learning is part of a process of developing one's full potential in life (1980, pp. 43-44). However the question here is not yet *how*, *when* or *where* should the instruction take place, but *who* will take part in the instruction. As we have mentioned before, students in blended learning are expected to be self-directed, to incur more responsibility for managing their learning (Dzuiban, Harman, & Moskal, 2004, p.8).

a) Developmental reality

Every student approaches an educational experience from a uniquely diverse developmental reality. An ecology of internal and external resources affords the student´s active involvement in the course and facilitates or constrains their learning and understanding. These developmental realities are composed by: their biological, cognitive-affective, and sociocultural processes; and their dynamics of equilibration, i.e. assimilation and accommodation, and plasticity across their lifespan. Even though a longitudinal analysis of the developmental trajectories of each student is beyond the scope of this study, it is important to consider the vast and complex reality that each student brings into the educational process. Skilled teachers become practical experts on these developmental realities, which are the object of study of Developmental Psychology.

Development is fundamentally biological (Harris, 1957): living structures and life processes first, physical systems and systems of ideas second. In biological terms, development involves discussions about the organisms conceived as living systems, a process that occurs over an extension of time and

not in short intervals, a movement toward complexity of organization, the comprehension of parts into large units or wholes, an end state of organization maintained with some stability or self-regulation (i.e. homeostasis), and about the purpose that drives that organism, that "something more which is not yet disjunctive with matter" (1957) not reducible to physiochemical terms.

Piaget and Inhelder, (1969, pp. 152 - 159) proposed that our intellectual and cognitive evolution, i.e. perceptions, comprehensions, structures; as well as the affective, i.e. the energetics of behaviour, emotions, motivation, can be explained by the cybernetic self-regulation of three processes: 1) organic growth and maturation, i.e. ontogenesis and heredity; 2) exercise and acquired experience in the actions performed upon objects, i.e. a) the abstraction of physical object´s properties and b) the logical relations and consequences of the subject´s actions coordinated upon external objects; and 3) social interaction and transmission. Vygotsky (1966) proposed that mental development is fundamentally socio-cultural, that speech is the central function of social relations and of the cultured behaviour of the personality because it helps us regulate each other's behaviour. Vygotsky (& Kozulin, 2011) proposed the zone of proximal development to observe the relation of mental development to Teaching and Learning by studying what can we do with the help of others.

Bronfenbrenner (1977, 1979, & 2005) recognized that human development is the result of the progressive, mutual accommodation, throughout the life span, between a growing human organism and the changing immediate environments in which it lives, an ecological environment or a nested

arrangement of formal and informal structures or contexts, each contained within the next. Baltes (1987; & Reuter-Lorenz, & Rösler, 2006; & Smith, 2008; Scheibe, Kunzmann, & Baltes, 2009) proposed a theory of wisdom from a perspective of bio cultural co-constructivism and lifespan development, i.e. a theory about what it means to have a complex dynamic system of expert knowledge, to be an expert in human nature and the life course. Lerner (2006) proposed that human developmental systems, from the biological and physiological to the cultural and historical, are characterized by their potential for systematic change, by *plasticity*.

b) Information processing and cognition

The Information Processing (Mayer, 2012) and Cognitive Architecture views (Sweller, 2012; Sweller, van Merriënboer, & Paas, 1998) are based on the idea that all humans have the same basic information processing system. These points of view recognize that there may be individual differences in terms of the speed of cognitive processing, the capacity of the working memory, and the way that cognitive processes are selected and used on a given task; and that individual differences and learning disabilities may also be related to learner characteristics such as age, developmental level, and gender. There are two information processing models, the basic framework consists of three memory stores: sensory memory, working memory, and long-term memory, and three cognitive processes: selecting, organizing, and integrating. The extended information processing model explicitly separates the processes of organizing words and images into visual/ pictorial and auditory/ verbal channels: a sensory visual system and a sensory

auditory memory, and the process of organization into a visual channel of working memory, and a verbal channel of working memory. These frameworks are based on four cognitive science principles: *dual channels* (Baddeley and Hitch, 1974), that people have separate channels for processing visual and auditory information; *limited capacity*, that only a limited amount of processing can be carried out in each channel at one time; *active processing*, that meaningful learning depends on appropriate cognitive processing (i.e. selecting, organizing, and integrating) during learning; and *knowledge driven,* that long-term memory knowledge can guide and structure cognitive processing during learning.

A key contribution of the information processing view (Mayer, 2012) is the specification of the knowledge that the learner needs to possess to be able to perform an academic task in six academic areas: phonological awareness is prerequisite for reading fluency, schemata or learners´ structures based on prior experience are prerequisite to reading comprehension; learners´ writing planning strategies or knowledge how to plan an essay are important prerequisites for writing effective essays; the learners´ conceptual knowledge of a mental number line is prerequisite to learning to solve arithmetic problems; preconceptions or specific conceptual knowledge that interferes with learning the scientific material needs instruction that directly confronts them; learning to become self-regulated learners, learners that take responsibility for their own learning monitor and control their cognitive processing during learning in line with their learning goals, require to have an repertoire of learning strategies such as self-explanation or structured notes.

According to Mayer (2012) the information acquisition view does not yet adequately address: the role of the learner´s motivation to learn, what activates and maintains learning attention, the learner´s strategies for managing learning processes, the learner´s beliefs about how learning works, how people differ in information processing during learning, how the social and cultural context of learning affects cognitive processing during learning, where does information processing occur in the brain, and how has the human information processing system evolved.

c) An instrument for producing worlds

According to Bruner (1986), based on Goodman´s (1984) constructivist philosophy of understanding, the mind should be defined as an instrument for producing worlds. Because language creates or constitutes knowledge or reality, not just transmits it, there is no unique real world independent of human mental activity and symbolic language. We create worlds of appearance through our symbolic procedures; we create worlds with our minds, with our languages and other symbol systems. We create these worlds out of worlds created by others that have preceded or that accompany us, not from an independent aboriginal reality. Education is a language, a symbolic procedure that creates cultures, i.e. that creates worlds, and not just the consumption or acquisition of knowledge. In a similar fashion, the worldview of historicity states that the human world is not merely a container for human beings but a complex of meanings. All human activity can be understood historically: “we appropriate our history in an act of self-interpretation, and it becomes part of the future we project for ourselves”

(Carr, 2006). Knowing about the past is to know where we have come from and thus who we are (p. 398).

Regarding learners and education, Bruner (1960) stated "any subject can be taught effectively in some intellectually honest form to any child at any stage of development" (p. 33). Such an effective teaching takes into account: a) the process of intellectual development in children; b) the act of learning; and c) a spiral curriculum. To take into account the process of intellectual development during the process of teaching is to translate, to represent the structure of the subject in terms in which the child (i.e. the learner) views things. Learners can view things *preoperational* or getting data about the world through direct experience, *operational* or the use of an internalized structure of accumulated experiences, and *formal* or the ability to conjure a full range of hypothetical alternative possibilities not constrained to what is or has been experienced (1960, pp. 34-37; Piaget & Inhelder, 1969). Learning a subject seems to involve three processes almost simultaneously: the *acquisition* of new information, counter, replacement or refinement of what the person has previously known implicitly or explicitly; *transformation* or manipulation of knowledge to make it fit new tasks, to deal with information in order to go beyond it; and, *evaluation*, checking whether the way we have manipulated information is adequate to the task (Bruner, 1960, pp. 48-49). Motivation to learn, what the person expects to get from her or his efforts, is what determines "how sustained an episode [of learning] a learner is willing to undergo" (p. 49). Intrinsic rewards, in the sense of quickened awareness and gains in understanding (i.e. subjective understanding), should be emphasized

if one wants to familiarize the learner to increasingly longer episodes of learning. The challenge is to "devise materials that will challenge the superior student while not destroying the confidence and will-to-learn of those who are less fortunate" (p. 70). Similar to the Information Processing view, Bruner recognized the severe limit on how much new information we can keep in mind. New information is that which we cannot quite fit into the structure of subjects that we already have and "the more one has a sense of the structure of a subject, the more densely packed and longer a learning episode one can get through without fatigue" (pp. 51-52). The spiral curriculum is the notion that "any idea can be represented honestly and usefully in the thought forms of children of school age, and these first representations can later be made more powerful and precise the more easily by virtue of this early learning" (p. 33), and it should be built "around the great issues, principles, and values that a society deems worthy of the continual concern of its members" (p. 52).

d) Self-Regulated Learning

Active and independent academic learning requires an ecology of internal and external resources, a set of conducive cognitive and affective self-regulatory capabilities and affects. According to Schunk (2012) social cognitive researchers recommend explicit teaching of self-regulatory strategies through modeling.

Self-regulated learning theory (Zimmerman 1986, 2008; & Labuhn, 2012; Davidson & Sternberg, 2003) explains how students become masters of their own learning processes. Students are self-regulated when they are meta-cognitively, motivationally, and behaviourally active participants in their own learning

processes. Human self-regulation (Bandura, 2001) entails positive and negative feedback systems, i.e. it relies on discrepancy production and discrepancy reduction. We motivate and guide our actions by setting challenging goals and by trying to fulfill them, and not only by trying to reduce the disparities between our perceived performance and an adopted standard. Attaining our goals improves our sense of self-efficacy and motivates us to set higher goals.

The integrated perspective of self-regulated learning (Zimmerman & Labuhn, 2012) evolved from four research strands: the effectiveness of meta-cognitive strategies, self-motivation processes, behavioural self-control, and supporting the development of self-regulation. Self-regulated learning is the feedback loop or cyclical process of: a) *forethought processes*, task analysis capabilities and levels of self-motivation, b) *performance control processes*, strategic use of diverse learning tasks and self-observation; and c) *self-reflection processes*, self-evaluation and causal attributions.

Forethought meta-cognitive processes research (Zimmerman & Labuhn, 2012; Bandura & Schunk, 1981; Gollwitzer, 1999; Bayer & Gollwitzer, 2007; Kitsantas & Zimmerman, 2002) has focused on *goal setting* and *planning,* while forethought motivation processes research (Zimmerman & Labuhn, 2012; Zimmerman, 2000, 2008; Zimmerman & Bandura, 1994; Bandura, 1997; Abar & Loken, 2010; Pintrich, 2000) has focused on *goal orientation*, *self-efficacy*, *interest*, and *task values*. Goal setting research has shown that goals of process improvement are more effective than performance outcome goals. Meta-cognitive forethought planning research has found that implementation intentions, i.e. to

specify when, where, and how responses lead to attain a goal, is more beneficial than only stating simple goal intentions. Goal orientation forethought motivation research has shown that mastery or learning goals drive learners towards the development of skill and have positive influence on meta-cognitive processes and motivational beliefs. Performance goal orientation drives students to achieve positive and avoid negative competence judgments; on their own, performance goals lead to more maladaptive motivational and cognitive outcomes but not when found together with mastery goals. Self-efficacy research shows that students' beliefs about themselves and their own capabilities strongly influence academic achievement, personal standards of performance, responsibility for learning, persistence and perseverance in the face of adversity. Students' interest research has found that students' beliefs about the value of an activity for its inherent properties, together with self-efficacy beliefs, are correlated positively with students' performance, especially in less structured instruction. Task values research is based on the expectancy-value theory of motivation and shows that the perceived value of the nature of a task according to personal needs, goals, and broader personal values can be observed in greater students' effort and persistence.

Performance control research (Zimmerman & Labuhn, 2012) has focused on *strategy use*, *meta-cognitive monitoring*, and *self-recording*. Apparently, no research has been conducted to analyze the emotional control of performance during self-regulated learning. The study of the use of diverse strategies to guide learning, i.e. strategy use research, has demonstrated with writing and math

instruction that it is beneficial to train students to develop the use of self-regulated learning strategies. Meta-cognitive monitoring research has found that the process of informal mental tracking of one's performance and outcomes helps calibrate the perception of capabilities and competence of the self. Self-recording research has shown that the use of formal records of learning processes or outcomes enhances the development of skills and self-efficacy beliefs.

Self-reflection meta-cognitive research (Zimmerman & Labuhn, 2012; Graham & Weiner, 2012; Newman, 2007) has focused on *self-evaluation*, *attributions*, and *adaptation*, while the study of motivation during self-reflection (Zimmerman & Labuhn, 2012; Schunk, 1984, 2008, & 2012; Weiner, 1979, 1992, & 2004) has focused on *attributions*, *self-satisfaction*, and *affect*. Students' self-evaluation based on graduated standards (vs. absolute standards) rewards them with a progressive mastery. Attributing the causes of failure to internal, unstable and controllable causes leads students to improved expectancy, affect, and achievement. Being ready to adapt one's strategies or procedures and seek out social assistance are self-regulatory skills displayed by experts more than novices. Research of motivation and attributions has found that the students' beliefs concerning the causes of their performance outcomes influence their expectations about their future success, motivation, and emotions. Attributional feedback can help students reduce maladaptive attributions and raise their self-efficacy beliefs. Self-satisfaction motivation research has shown that student's perceptions of satisfaction and associated emotions regarding their own performance depend, for proactive students, on their personal goals. Goals should preferably be graduated

rather than absolute and students' self-satisfaction predict subsequent goal setting. Affect research (Weiner, 2004) studies the relation of students' positive or affective responses and specific attributional patterns, the use of self-regulatory strategies, control beliefs, and goal orientation.

The Instructional Design

Alexander, Murphy, and Greene (2012) used Schwab's (1978) description of Education as "someone teaching something to someone in some context" (p. 17) to explain the past, present, and future of the field of Educational Psychology. In a strict sense, every teacher has a plan for their instruction, and as such produces or designs the learning experience for their students. Even the most open and unstructured forms of teaching or instruction modify the natural processes of socialized learning. Because the focus of this study is on structured forms of teaching for now we will only intuitively speculate that the most powerful learning is probably that which *is* without a purposeful and organized intervention. Such type of natural learning must entail the processes by which we pass on the essences of our particular and historical ways of being to our offspring, our existential and practical wisdom, including our languages, which are in turn a synthesis of our ancestors' and our experiences in the world.

Rousseau (1762) once wrote: "We are born weak, we need strength; helpless, we need aid; foolish, we need reason. All that we lack at birth, all that we need when we come to man's estate, is the gift of education. This education comes to us from nature, from men, or from things" (p. 6). In the realm of organized and purposeful educational interventions, i.e. designed instruction,

much discussion has been put into comparing the effectiveness of one or another context for learning, e.g. online vs. face-to-face learning. In the first part of this Instructional Design framework we will briefly review some considerations regarding the "Places and time" where education takes place. A revision of the historical and philosophical foundations of the design of instruction, the section "Learning Theory, and Philosophies of Education," should help reveal that a) the notion that there is a higher knowledge that can be discovered and kept introduced the need to find ways to pass it on in order to preserve it; that b) the notion that there are better ways of being human introduced the need to find ways to help bring forth or construct such ideal ways of being; and thus c) education is the process by which humans seek to pass and preserve a treasured knowledge and to help bring forth an ideal way of being human. These are the frameworks in which someone teaches something for someone to learn in some context.

The debates about who should teach, how, when, what, to whom, and where become more interesting due to the fact that each person´s or group´s historical ideas about the ideal ways of being and how the world is or should be are embedded and taken for granted in almost every argument and position. That is why scholars like Kanuka and Smith (2013) or McRae, Adams, Buck, and Thompson (2007) remind us that it is important to be aware of our beliefs and to reflect on our philosophical orientations. In a similar fashion, Sherry Turkle (2011) and Appiah (2008) explained that our challenge in life should not be so much to figure out 'how best to play a game' (i.e. skilful efficiency and effectiveness) but to figure out 'what game we are playing' (i.e. understand); that

we can choose how to frame or describe a situation (i.e. *autopoiesis*), and recognize and question the frames from which any bundled solutions are presented to us (i.e. critical thinking).

A lot more debate has been produced as well to define that something that needs to be learned, i.e. the content or the curriculum, and no less to define what is teaching and how it should be done. In the third section, "Instructional Designs" we will review four instructional-design theoretical frameworks to learn some of the contemporary principles with which we can evaluate a design of instruction. Rousseau (1762) thought that in regards to any scheme or method of instruction two things should be considered: a) is it good in itself; and b) can it be easily put into practice (p. 2). For a scheme to be good "it is enough that [it] is intelligible and feasible in itself, that what is good in it should be adapted to the nature of things, in this case, for example, that the proposed method of education should be suitable to man and adapted to the human heart" (p. 2). The easiness with which a scheme can be put into practice, the more or less success of the special application of any scheme, depends upon accidental and indefinitely variable given conditions usually beyond our human control, i.e. nature and things. Locke (1764) had a similar opinion when he wrote: "if one should take in the various Tempers, different Inclinations, and particular Defaults, that are to be found in Children, and prescribe proper Remedies. The variety is so great, that it would require a Volume; nor would that reach it" (p. 324), because "there are possible scarce two Children, who can be conducted by exactly the same Method" (p. 324).

a) Places and Time

There has been much discussion about which are the most effective places for instruction. In a range of possibilities some argue that the classroom provides the best conditions for learning while others sustain that online learning from the convenience of one's home or office or the *real world* supported by mobile technologies. The vision of blended learning is the thoughtful fusion of the face-to-face and online learning experiences (Garrison & Vaughan, 2008), to combine the effectiveness and socialization opportunities of the classroom with the technologically enhanced active learning possibilities of the online environment (Dzuiban, Harman, & Moskal, 2004).

The medium or media are extensions of us (McLuhan, 1962, 1964), which shape and control the scale and form of human association and action; and constitute an alteration of the environment to provide an affordance (Gibson, 1979). Students in a blended learning experience have to be literate or learn to negotiate and navigate many different environments: e.g. the realm of higher education, the University and its corresponding Faculty, Department and program, the classroom, the computer, the Internet, the Virtual Learning Environment, and hypermedia. Many authors (Fahy, 2008; Rovai & Barnum, 2003; Bruner, 1960; Gagné, 1965; Skinner, 1968) have observed that in terms of effectiveness, course design and pedagogy are always more important than media. For the purposes of this study we will consider that neither medium is void of affordances and limitations, and concentrate on observing that each place and time requires a purposeful and organized design of instruction. Thus, we will now briefly review

a few theoretical considerations regarding teaching and learning in these places and times.

1. A Higher Education Course

Any course or program of Education is embedded in the larger context of Higher Education, the University, Faculty, Department, and the Program or curriculum to which the course belongs. All of these environments afford and influence instruction and student learning. However fascinating the study of these factors that support and influence learning and Education we will move closer to the student, we will focus on the facets that are "more directly under the direct control of teachers" (Hosp, 2012, pp. 102-103) and instructional designers.

2. The Classroom

Classrooms are dynamic systems (Bronfenbrenner, 1979; Patrick, Mantzicopoulos, & Sears, 2012) that provide opportunities for sustained interactions and relationships amongst peers and authority figures; and classrooms are embedded in wider and changing contexts, i.e. intersect with larger complex systems. Within the classroom the study of the effect of class sizes (Blatchford, 2012) is a highly debated topic and many research efforts have been put into demonstrating the effect of class size on educational outcomes and classroom processes. This extensive research by Blatchford (2012), although debatable, has shown that less experienced students benefit most from class size reduction and that class sizes most likely have effect on teacher individual attention toward students and student engagement; but there is still a need for research that evaluates the effects of class size with specific pedagogical approaches.

According to Patrick, Mantzicopoulos, and Sears (2012) an effective classroom learning environment is that which prepares students to develop skills for living in a rapidly changing world. An effective classroom (2012) is brought forth by the interconnection of factors that are usually discussed separately: learning, motivation, teacher-student relationships, emotional development, instructional practices and tasks, social development, and engagement; and its core elements, processes, and practices are:

In terms of the design or methods of instruction:

- Students and teachers share responsibility for student learning
- All students learn and improve relative to what they knew and could do previously
- The focus is on understanding, not memorizing or following procedures
- Students' talk during lessons is valued and encouraged
- Students receive informational feedback and recognition for their progress and effort
- Students' learning environment is well structured, emotionally secure, and predictable

In terms of student´s attitudes or motivation:

- Students view learning and personal improvement as realistic and their primary goal
- Students value learning and are motivated to learn
- Students have positive relationships with their teachers
- Classmates are emotionally, socially, and academically supportive of one another
- Comparisons of ability and competition among students are low

In terms of desired outcomes:

- Students apply what they have learned to new situations
- Students develop sound learning and work habits
- Students develop effective strategies for recognizing and managing their emotions
- Students develop socially in positive ways

3. Distance Education

The field of distance education (Anderson, 2008) is complex, diverse, and rapidly evolving. According to Taylor (2001 as cited in Anderson, 2008) the practice of distance education has evolved through five generations: 1) the

correspondence model based on print; 2) the multimedia model based on print, audio and videotapes, computer based learning and interactive video; 3) the teleconference model based on audio and video teleconferencing, audio graphic communication, and TV and Radio broadcasting; 4) a flexible learning model based on interactive online multimedia, Internet based access to resources, and computer mediated communication; and 5) the intelligent flexible learning model based on the same resources from the last generation but with automated response systems and campus portal access to institutional processes and resources. Anderson (2008) describes this fifth generation as the educational Semantic Web, a model based on autonomous agents and intelligent, database assisted learning.

4. Online Learning

Online learning (Ally, 2008) entails a learner that is at a distance from the instructor and uses some form of technology to access learning materials, interact with the instructor and other learners, and receive some form of support. In other words, online learning is a learner that uses the Web to go through a sequence of instruction, and completes its learning activities to achieve the learning outcomes and objectives. Online delivery allows for flexibility of access, for participants to collapse time and space, but as any other purposefully organized learning requires sound instructional design principles.

An instructional-design for online learning (Ally, 2008) takes into consideration the following components: a) *Learner preparation* or a variety of pre-learning activities to prepare the learners for the details of the lesson, motivate them to learn and help them connect with the online lesson; b) *learner activities*

or a variety of learning activities that should help students achieve the lesson's learning outcome while catering for their individual needs; and c) l*earner interaction* with the interface to access the online materials, the content, other learners, the instructor, external experts, and their own context.

Anderson´s (2008) Theory of Online Learning attempts to envision how to best take advantage of the enhanced communication, information retrieval, creative tools, and management capability of the Internet, provide specific recommendations for the most effective investment of time and resources, and help interpret and plan for the unknown built on what is already known; this theory also recognizes that "there is no single best media of online learning, nor is there a formulaic specification that dictates the type of interaction most conducive to learning in all domains and with all learners" (p. 66). According to this theory, effective online learning environments are: learner-centred, knowledge-centred, assessment-centred, and community-centred. *Learner or learning centered* means being aware of the unique cognitive structures and understandings that learners bring to the learning context by making extensive use of diagnostic tools and activities, and constantly probing for learner comfort and competence with the intervening technology. *Knowledge-centred* means that because effective learning is both defined and bounded by the epistemology, language, and context of disciplinary thought students are provided with opportunities to experience this discourse and the underlying structures of the discipline and with opportunities to reflect upon their own thinking; it also means the provision of a mental representation of the whole to guide the student´s exploration of the knowledge

resources of the discipline that exist on the Internet expressed in thousands of formats and contexts. *Assessment-centred* means attending to the necessity for formative evaluation and summative assessments that motivate, inform, and provide feedback; it also means to provide many opportunities for assessment from teachers, peers, external experts, machine algorithms, and oneself with an understanding of which assessment is most useful instead of which one is easier. *Community-centred* means to consider how can students work together collaboratively to create new knowledge, i.e. to foster the creation and sustainment of communities of inquiry (Lipman, 1991) or communities of practice (Wenger, McDermott, & Snyder, 2002) in which members of the learning community both support and challenge each other towards an effective and relevant knowledge construction; it also means being attentive to the challenges posed by the lack of synchronicity in time and place, the absence of body language, and the need to develop social presence.

Anderson´s Interaction Equivalency Theorem (2003, 2008) postulates that the many modalities of interaction afforded by the Internet are equivalent or exchangeable, i.e. the possibility of substituting one form of interaction with another depending upon the actors, costs, content, learning objectives, convenience, technology used, and time availability. The higher and richer the forms of communication, the more restrictions or costs are placed upon independence of time and place. Moore (1989), Anderson and Garrison (1998), and Dron (2007) studied eight types of educational online interactions: 1) *student-student* or peer-to-peer interactions; 2) *student-teacher* interactions supported in

online learning on a large number of varieties and formats including asynchronous and synchronous communication in text, audio, and video communications; 3) *student-content* or library study, reading textbooks, immersion in micro-environments, exercises in virtual labs, and online computer-assisted learning tutorials; 4) *teacher-teacher* or teachers' professional development through supportive communities; 5) *teacher-content* or the teacher's creation of content; 6) *content-content* or content programmed to interact with other automated information sources to constantly refresh itself and acquire new capabilities; and 7) *learner-group* and 8) *teacher-group* interactions which open the online classroom to far more diverse and often less reliable viewpoints, resources, and insights gathered from the Internet.

5. Virtual Learning Environment (VLE)

A Learning Management System (LMS) or Virtual Learning Environment (VLE) is a web-based software application using a database on which various types of information are stored (Ifenthaler, 2012). At the University of Alberta, Moodle powers the LMS eClass; an open-source learning platform designed "to provide educators, administrators and learners with a single robust, secure and integrated system to create personalised learning environments" (Moodle.org, 2014). According to Dougiamas (2014) a set of five social constructionist pedagogy principles guided the development of Moodle´s computer-based learner-centric tools and collaborative learning environment:

1. All of us are potential teachers as well as learners - in a true collaborative environment we are both.
2. We learn particularly well from the act of creating or expressing something for others to see.

3. We learn a lot by just observing the activity of our peers.
4. By understanding the contexts of others, we can teach in a more transformational way.
5. A learning environment needs to be flexible and adaptable, so that it can quickly respond to the needs of the participants within it. (2014)

This pedagogy takes into account the following theories of learning: constructivism (Bruner, 1960, 1966, 1986; Piaget & Inhelder, 1969), which explains the natural knowledge building mechanism of learning, a reconstruction of knowledge that results from our experience with our environments; constructionism (Papert, 1980), which explains how computational environments can be powerful tools for the natural learning of mathematical ideas; and social constructivism (Schunk, 2012; Vygotsky, 1966, 1978; & Kozulin, 2011), which recognizes the influence of the socio-cultural environment, the influence of others in what we can achieve.

6. Hypertext

Hypertext in semiotics (Genette, Newman, Doubinsky, & Prince, 1997; Martin & Ringham, 2006) is an imitation, parody, or pastiche that evokes or derives from a previous text without necessarily mentioning it. Hypertext in information systems (Stefanakis & Peterson, 2006) is a collection of documents or *nodes,* containing cross-references or *links,* which with the aid of an interactive browser program, allow the readers to move easily from one document to another; it is an extension of the linear text to the nonlinear or non-sequential form. Hypertext as a collection of associated and non-linear nodes was envisioned by Bush's Memex (1945), Nelson's Xanadu Project (1965, 1987) and conceptually by Borges' "labyrinths" (1962). In informational systems hypertext, meaning is

derived not only from the content presented but also from its arrangement, i.e. the dynamic associative or semantic relationships between nodes (Borsook & Higginbotham-Wheat, 1992).

7. Multimedia

Multimedia (Stefanakis & Peterson, 2006) is the combination of text, graphics, audio, video and animation that are created and delivered on the screen. Bruner (1960) defined audio-visual aids as *devices for vicarious experience* whose effectiveness depend "upon how well we are able to integrate the technique of the film maker or the program producer with the technique and wisdom of the skilful teacher" (p. 92). Dale (1969) proposed that our experiences with instructional devices vary according to the degree in which we are involved physically or in thought, i.e. a cone of experiences based on Bruner's (1966) three modes of learning experience: 1) the direct, enactive or doing, 2) the iconic or looking at pictures, films or drawings, and 3) the symbolic or being able to derive meaning from hearing or reading words.

Multimedia learning (Meyer & Moreno, 2003) is learning from words and pictures and *multimedia instruction* is to present words and pictures to foster learning. The information processing multimedia instruction (Mayer, 2012) seeks to encourage learners to engage in appropriate or generative cognitive processing without overloading their information processing system by taking into account their prior knowledge and the availability of their visual and auditory channels. Meyer's (2009, 2011, 2012) research-based principles of multimedia learning and instruction are the following: 1) Principles that seek to reduce extraneous

processing: a) *coherence* or removing extraneous material, b) *signalling* or highlighting essential material, and c) *contiguity* or present corresponding words and pictures near each other; 2) Principles that seek to manage essential processing: a) *pre-training* in the characteristics of the key elements, b) *segmenting* or breaking the lesson into learner-paced segments, and c) *modality* or presenting spoken words instead of printed words with pictures; and 3) Principles that seek to foster generative processing: a) *multimedia* or presenting words and pictures rather than words alone, b) *personalization* or presenting words in conversational style rather than formal style, and c) *generative principle* or asking the learner to engage in productive activities such as self-explaining, self-testing, or summarizing.

However, media are not only sources of auditory or visual stimulus, media are lived environments (Allen, Otto, & Hoffman, 2012), and media with highly dynamic audio visual content and highly redundant auditory and visual information such as films not always overload the learners cognitive channels (Tibus, Heier, & Schwan, 2012). Moreover, multimedia instruction might reshape and constrain knowledge in particular ways and affect the concrete, subjective, and pre-reflective dimensions of teachers' and students' life worlds (Adams, 2006, 2007; Vallance & Towndrow, 2007).

8. Hypermedia

Multimedia added a new dimension to hypertext, and mutated the term into hypermedia (Guimarães & Garriço, 2010). Hypermedia is simply multimedia hypertext (Nielsen, 1990). Park and Gannafin (1993) proposed twenty principles

for the design of interactive multimedia using psychological, pedagogical and technological foundations. Interactive multimedia means to dynamically link and manage nodes of information that contain multiple systems of symbols and images within a medium or across different media. Hoffman and Novak (1996) provided the following useful distinction: "Multimedia uses a computer to integrate and provide interactive access to both static (i.e., text, image, and graphics) and dynamic (i.e., audio, full-motion video, and animation) content, whereas hypermedia combines the node-and-link access of hypertext with multimedia content" (p. 53). Kraemer (2014) explained that hypermedia combines text, image, video, animation, and sound into a total work of art extended by the interactivity with the user, and that some *hyperlinked masterworks* are comparable to contemporary art that should be analyzed with standard criteria of narration, dramaturgy, navigation, and design, and methods derived from art history, media sciences, film making, and musicology. In some studies the term hypermedia is used to refer to the student's use of hypermedia for authoring (Wilson, Peck & Jonassen, 1999) or as a tool for their note-taking processes (Ruffini, 1999).

In the context of EDU 210, hypermedia presentations are slides enhanced with multimedia content and interactivity. Multimedia content includes the narration of the instructor´s voice and other audio cues, and images, video, text and animations that provide visual cues. Interactivity allows the students to control the flow of the presentation by choosing their own learning path within the content and it also provides opportunities to play with the content through activities such as drag and drop, list ordering, multiple responses, open-ended

questions, and many others.

Learner control (Scheiter & Gerjets, 2007), one of the defining characteristics of hypermedia, implies the potentially and different ways of interacting with multiple representations, i.e. allowing the learners to decide the sequence, select the content, the forms of representation (e.g. verbal or pictorial), and the pace of information. Hypermedia with flexible learner control was thought to be potentially more effective because: hypermedia structures mirror the mind, fosters interest and motivation, allows the learners to configure the information according to their preferences, intentions, and needs, affords active and constructive information processing (i.e. not passive), and may train students' abilities to self-regulate their learning processes. However, research has showed that hypermedia environments involve usability problems such as disorientation, distraction, and cognitive overload (2007), that learners of all ages have difficulty regulating their learning when using hypermedia environments to learn complex topics and gained little conceptual understanding (Azevedo, Cromley, Winters, Moos, & Greene, 2005; Greene, Bolick, & Robertson, 2010), and that externally-facilitated regulated learning is more effective than self-regulated learning with hypermedia (Azevedo, Cromley, Moos, Greene, & Winters, 2011).

In adaptive hypermedia, the computer through artificial intelligence technologies (A.I.) will be able to read the learners' predispositions and adjust the content, interactions and provide feedback accordingly. In order to produce this type of learning experience the computer will require two important elements: the production of a wide range of content and learning paths, and training the

Artificial Intelligence (A.I.) algorithms to evaluate the type of learner present before it. Machine learning and computational learning theory are the fields tackling the questions about computers being able to learn without being programmed. Examples of machine learning applications are the artificially intelligent algorithms used in data mining or robotic unmanned vehicles. It can be foreseen, because of the probabilistic nature of the A.I., that the computer will require tracking the behaviour of hundreds, if not thousands of users in order to approach the incommensurable reality of the infinite types of potential learners or users. The computer will preferably track as many layers of human input as possible, e.g. body gestures, facial gestures, eye movement, body temperature, neural activity, among others. In other words, it will need to emulate as much as possible the perception of a wise and highly skilled human teacher.

b) Learning Theory and Philosophies of Education

21st Century Learning literature (Pond, 2002; Vaughan, Garrison, & Cleveland-Innes, 2013) is commonly grounded on the notion that *new* approaches to teaching are needed to overcome a model based on purposes and methods that are no longer useful or pertinent for the current societal reality. However, getting rid of the old and making way for the new does not help overcome the same problems every teacher in human history has had to deal with when putting these recursively new ideals into practice.

Technology affords students and teachers to exchange information asynchronously, to communicate via text, image, audio, or video through several different services enabled by the personal computer and the Internet, i.e. the

interplay of interactions across different times and places. However, many types of learning experiences can be produced depending on the types of interactions or activities planned, whether the path of the activities is decided by the teacher, or led by the student, whether they have discrete and well established objectives or open goals, a prescriptive or descriptive curriculum, and whether the activities are based on reinforced practice, rote memorization, naive exploration or guided critical thought, among many other dimensions.

Throughout the history of Western Education many different philosophies have expressed diverse societal aspirations about the purpose of education, the expected role from schools and teachers, the subject matter or curriculum, and the instructional or teaching method, i.e. how to teach. And many different technologies have impinged on the social reality of such aspirations and expected roles (Fahy, 2008) through periodical cycles of increased and declined support or *bandwagon effects* (Buck, 1992). However, it is not the same to *train* someone how to do something than it is to *educate* him or her to make their own determinations about what is good and how it can be achieved. It is certainly not the same to educate to pass on an accumulated wisdom than it is to facilitate the realization of one´s own potential. As time passed by, instructional design models (Paas, van Merriënboer, & van Gog, 2012) have been developed in response to diverse societal aspirations and for more than a century these have also been based on developments in the understanding of human learning, i.e. educational psychology behaviourist, cognitive, and constructivist theoretical approaches.

1. The whole is the sum of its measurable parts

Plato (Emlyn-Jones, & Preddy, 2013; & Shorey, 1935) established that real knowledge is independent from our senses. An intelligible Form of the Good, which is the head of the hierarchy of Forms, illuminates, generates and sustains the world and should be best understood by astronomic and mathematical studies (2013, pp. xxvii-xxviii), i.e. one and absolute truth which can be best explained by the sum of its measurable parts (Aristotle & Rackham, 1934). The purpose of Education for Plato is to best serve individuals by subordinating them to a just society by means of a noble lie, to achieve happiness by setting each to serve in their specialized activities while a few educated will come into the presence of truth by means of science and mathematics.

Our current Western societal reality was built since the early 19th Century, when *Industrial Revolution* (Drucker, 2003) transformed societies by Technology, i.e. when the world changed from craft-based production to the logically organized and purposefully directed knowledge of the craftsman (2003). It is a societal reality in which technology has allowed humans to predict and control the world (Grimm, 2012, pp. 110-111). During most of the 19th Century and since the last three decades of the 20th, essentialist (Bagley, 1934), perennialist (Hutchings, 1962, 1969; Newman, 1873), and neoessentialist (Hirsch Jr., 1983, 1996; & Kett, & Trefil, 1988) philosophies of education provided a framework in which teachers were expected to be masters of their content to pass on an essential knowledge, a core curriculum, the accumulated wisdom of a Western Canon, including a set of intellectual tools provided by Science, Mathematics, and

Computer Science (e.g. Papert, 1980), in sum, the acquisition of a particular Cultural Literacy (Hirsch, 1983). In this worldview, students were to be motivated through external systems of rewards and penalties. Direct instruction was the preferred method while the students were expected to listen and observe. The teacher was a central authority in the classroom. The preferred materials for instruction were textbooks, lectures, and individual assignments. Learning was thought to be individually independent, not social. Students' rote memorized the content in order to demonstrate that they had the knowledge. Individual performance was to be evaluated objectively in a standardized form. Behaviourist and cognitive psychological theories of learning are coherent with perennialist, essentialist, or neoessentialist educational philosophies because of their shared philosophical foundation, i.e. Plato. This worldview was criticized (Locke, 1764; Rousseau, 1762; Dewey, 1938; Dewey & Small, 1897; Freire, 1970) for promoting social conformity, a biased cultural ethnocentrism, a banking model of education, and a culture of silence.

By the mid-20th Century, from being applied to tools (i.e. machines) Technology, the logically organized and purposeful knowledge, turned to systematically improve manual work (Drucker, 2003). In this context, *part-task models of instruction* proposed different step-by-step designs that helped analyze any learning content and organize the instruction in a logical sequence of discrete bits (Paas, van Merriënboer, & van Gog, 2012). Behaviourist instructional models (van Merriënboer & de Bruin, 2014) established a design in which knowing was a collection of learner's specific responses to stimuli; a design in which small

learning steps, reinforcement, contiguity, and repetition are the most important factors that influence learning (Skinner, 1954, 1968; Mager, 1984); a teaching technology which could be performed by teaching machines (Skinner, 1968). Cognitivist instructional models (van Merriënboer & de Bruin, 2014) established a design in which knowing was an active mental processing of information, in which to know is to have a set of constructed mental models of a given subject-matter domain and to use them to solve problems and think critically; a design in which the most important factors that influence learning are the limited processing capacity of the human mind (Atkinson & Shiffrin, 1968; Sweller, 2012; Sweller, van Merriënboer, & Paas, 1998; van Merriënboer, 1997; Merrill, 2001, 2002, & 2013), and what the learner already knows (Gagné, 1965, & Gagné, 1985; Ausubel, 1968). It is a design coherent with the use of slide based multimedia representations of knowledge (Meyer & Moreno, 2003). According to Drucker (2003), these models of training helped bring forth the systematic effective and efficient training of manual work, the 1950´s to 1990´s *Productivity Revolution*.

2. The whole is more than the sum of its parts

Aristotle (& Rackham, 1934) thought that knowledge comes first from experience, that all peoples' concepts and knowledge are ultimately based on perception. The purpose of education for Aristotle (Hummel, 1993) was the complete self-realization of man: happiness was the ultimate realization of a free, virtuous, and fully developed human being; virtuous activities constitute happiness and the path to learning the virtuous life was education.

In the last part of the 19th Century and throughout most of the 20th

Century, progressive (Locke, 1764; Rousseau, 1762; Dewey, 1938; Dewey & Small, 1897; Kilpatrick, 1926; Noddings, 1992, 2005; Noddings & Shore, 1984; Rorty, 1982, 1989; Rorty, Williams, & Bromwich, 1980), humanistic (Maslow, 1943, 1966; Rogers, 1951, 1969; Steiner, 1965; Montessori, 1966, 1967), and critical (Freire, 1970) philosophies of education provided a framework in which teachers were expected to foster their students´ intellectual curiosity and the development of their capacities, the realization of their students' potential. In the words of Locke (1764): "The business of education is not (...) to make them perfect in any one of the sciences, but so to open and dispose their minds as may best make them capable of any, when they shall apply themselves to it" (p. 44).

In this worldview, students were expected to be intrinsically motivated to know: to want to know for the pleasure of knowing, to satisfy their curiosity. Preferred methods of instruction for this worldview were: hands on activities, student led discovery, and group activities. Preferred materials were project based and included any available resources such as the Internet, library, and experts. Learning was thought to be socially developed, as part of a community of inquiry. Individual performance was to be preferably evaluated by subjective narrative means and ideally no comparison should be drawn between students, i.e. there should not be a standardized evaluation. Constructivist models established that knowing is dynamic and individually constructed by observation and experimentation, that to know is an active interaction between an individual and its environment (van Merriënboer & de Bruin, 2014), and that this interaction with the world and with others is the most important factor that influences

learning (Piaget & Inhelder, 1969; Bruner, 1960, 1966, 1986; Vygotsky, 1966, 1978; & Kozulin, 2011). The constructivist theory of learning is coherent with progressive, humanistic, and critical educational philosophies because of their shared philosophical foundation, i.e. Aristotle. This worldview has been criticized for promoting hedonism, anarchy, and critical change (Newman, 1873; Bagley, 1934; Hutchings, 1962, 1969; Hirsch Jr., 1983, 1996; & Kett, & Trefil, 1988).

3. Technology and Education

Constructionism (Papert, 1980; Resnick, Bruckman, & Martin, 1996; Bers, Ponte, Juelich, Viera, & Schenker, 2002) is an instructional design theory that is based on the notion that people learn better when they are engaged in designing and building their own personally meaningful artefacts with computers and sharing them with others in the community, and that computational environments are powerful tools to support new ways of thinking and learning. Constructionism associated Piaget's constructivism (& Inhelder, 1969), which explained our natural knowledge building mechanisms, with the notion that computers are powerful tools for learning. In other words, constructionism represents an interesting blend of philosophical worldviews: the holism of constructivism, and the monism of the computational environments as the default medium, i.e. a holist experience of an *enframed* (Stiegler, 2012) monist environment. The constructionist model of instruction follows four principles or pillars: 1) setup computational environments to help children to learn by doing, active inquiry and playing with computational materials, to learn by designing; 2) use the computer as a powerful tool to design, create and manipulate objects in the real and virtual

world, the use of concrete objects; 3) empower the individual with a set of intellectual tools worth learning, i.e. a curriculum of mental processes and domain content, the powerful ideas of Science and Mathematics; and 4) use documentation to make self-reflection concrete and to share its products with others, i.e. to explore one´s own thinking process, intellectual, and emotional relationship to knowledge, and personal history.

Connectivism (Siemens, 2005) is presented as a learning theory "consistent with the needs of the twenty first century, the use of technology and networks, and the diminishing half-life of [commoditized] knowledge [i.e. information]" (p. 3). The learning described by connectivism does not occur on the individual, it occurs "outside of people" (p. 5) since it is a learning that is stored and manipulated by technology and organizations. Connectivism is more of a curricular theory or agenda than a learning theory for it does not explain the processes of learning, because it assumes they can be off-loaded to or supported by technology (p. 1), and instead it explains what is to be learned: "[it] provides insight into learning skills and tasks needed for learners to flourish in a [corporate] digital era" (p. 9), the description of the individual and societal *practices* that lead to diverse, autonomous, open, and connected successful networks (Downes, 2012, p. 85). According to Siemens (2005) the skills that need to be developed in this digital era are: 1) the rapid evaluation of the worthiness of knowledge or to draw distinctions between important and unimportant information, 2) the ability to synthesize and recognize connections and patterns or the capacity to create useful information patterns between sources of information,

to see connections between fields, ideas and concepts, 3) meaning-making and forming connections between specialized communities, 4) the ability to recognize and adjust to pattern shifts or when new information alters the landscape, and 5) the ability to plug into sources to meet the requirements of knowledge that is needed but not known. Connectivism is based on the connectionist neural network models, which are based on learning theories such as Donald O. Hebb´s (1949) associative neuropsychological learning theory. Hebb's theory is an attempt "to understand behaviour and reduce the vagaries of human thought to a mechanical process of cause and effect" (p. xi), and is conceptually the following:

> Any frequently repeated, particular simulation will lead to the slow development of a "cell-assembly," a diffuse structure comprising cells in the cortex and diencephalon (and also, perhaps, in the basal ganglia of the cerebrum), capable of acting briefly as a closed system, delivering facilitation to other such systems and usually having a specific motor facilitation. A series of such events constitutes a "phase sequence" - the thought process. Each assembly action may be aroused by a preceding assembly, by a sensory event, or - normally- by both. The central facilitation from one of these activities on the next is the prototype of "attention." The theory proposes that in this central facilitation, and its varied relationship to sensory processes, lies the answer to (…) the problem of the direction of thought. (Hebb, 2002, p. xix)

The Internet is a complex self-organized system of millions of linked computers and people using it for diverse reasons (Granic & Lamey, 2000). The Semantic Web (Anderson, 2008) is characterized by the extensive use of autonomous agent programs to classify and annotate all content and interaction data to sort, query, format, and make calculations and inferences about it. According to Granic and Lamey (2000) this self-organized system of interactions promotes the following modes of thought because of its ever open, flexibly self-

adaptive, and ever changing nature: 1) a perspectivist mode of thinking, 2) contextualized critical thinking skills, 3) a metacognitive representation of the self as a network of identities, 4) increased cognitive flexibility and 5) efficacy beliefs. According to Drucker (2003) in such dynamic reality, creative self-reflective people are crucial assets that need to be preserved and grown in a systematic, logical, and purposeful manner. This 21st Century understanding of the world is what calls for an education and training that includes teaching with technology and *apparently new* ways of conceiving and offering, teaching and learning (Vaughan, Garrison, & Cleveland-Innes, 2013). In the *Age of Information (*Reigeluth, 1999) these new ways are: the need for customization, team-based work, accountable autonomy, cooperative relationships, shared decision making, initiative, diversity, and networked communications among other. According to Paas, van Merriënboer, and van Gog (2012) this new era is one in which the models of instruction should be based on complex real-life experiences that foster flexible problem-solving and self-regulated learning skills (2012).

c) Instructional Design

Rousseau (1762) thought that "the most useful of all arts is the art of training men" (p. 1) and that he would rather "follow exactly any established method than adopt a better method by halves" (p. 2). William James, the American philosopher and psychologist, once wrote (1899) that "you make a great, a very great mistake, if you think that psychology, being the science of the mind's laws, is something from which you can deduce definite programs and schemes and methods of instruction for immediate schoolroom use" (para. 6). In

the realm of *Art and Education*, Munro (1926) wrote that "to inculcate a particular technique is to fix a habit of perception; when this is done, the individual is already an echo of somebody else, and the academic fetters are firmly fastened" (p. 322). More recently, Lowyck (2014) noted, "the transitions between theory, findings, principles, and concrete implementations are still considered problematic" (p. 15).

Many instructional-design theories have purposefully organized what is known about learning and instruction, and we will review four of these instructional-design theoretical frameworks: Gagné´s (1965, & Gagné, 1985), Reigeluth´s (1983, 1999, & Carr-Chellman, 2009), Merrill´s (2001, 2002, 2013) and Paas, van Merriënboer, and van Gog´s (2012) to learn some of the principles with which we can evaluate a design of instruction for its *adherence*, i.e. towards which framework it is conformed, and for its *coherence*, i.e. to what extent it conforms to such paradigm, to confirm that it was not adopted *by halves*.

1. The Conditions of Learning

The goal of Gagné's theory of instruction (1965) was to propose a rationally based relationship between learning processes, instructional events, and learning outcomes (p. 244). The Conditions of Learning theory of instruction is based on the notion that learning is a set of nine internal processes that transform the stimulation of an environment into long-term memory states or learning outcomes. Every learning event entails the presence of a *learner* with time devoted to learning and a favourable desire to learn, an *event* that stimulates the learner's senses or stimulus, the contents of the learner's *memory* or previous

knowledge and skills (e.g. discourse comprehension), and a *response* or performance from the learner that results from these inputs.

The nine internal processes and corresponding instructional events are: 1) attention or alertness - gaining attention, 2) expectancy - informing learners of the objective, 3) retrieval to working memory - stimulating recall of prior learning, 4) selective perception - presenting the stimulus, 5) semantic encoding or entry to Long-Term memory - providing learning guidance, 6) responding - eliciting performance, 7) reinforcement - providing feedback, 8) retrieval and reinforcement - assessing performance, and 9) cueing retrieval and generalization - enhancing retention and transfer.

According to Gagné (1965), each of these instructional events must be designed specifically for different learning outcomes: *intellectual skills* or learning to use symbols to represent the environment with a rule-governed language (which in turn is composed of discriminations, concepts, rules, and combination of rules or higher-order rules); *cognitive strategies* or learning to regulate one's own internal processes of attending, learning, remembering, and thinking; *verbal information* or the ability to retain and access verbalized information from labels or names, facts, interrelated facts or bodies of knowledge, and organized sets of facts or schema; *motor skills* or the ability to perform certain prescribed movements and the improvement in their precision and smoothness with practice; and *attitudes* or internal affective and cognitive states and internalized behaviours that influence the individual choices of personal action towards objects, persons.

2. An Instruction for the Information Age

Charles M. Reigeluth described (1983) a variety of methods of instruction, then summarized (1999) a broad sample of methods of instruction for the Information Age, and recently proposed (& Carr-Chellman, 2009) a common knowledge base about instruction. Instructional-Design theories (1999) prescribe different types of methods of instruction according to the situation created by the instructional conditions and the desired outcomes. The instructional conditions under which the instruction takes place include: 1) the nature of what is to be learned (e.g. understanding vs. skills), 2) the nature of the learner (e.g. prior knowledge and motivations), 3) the nature of the learning environment (e.g. class size and place), and 4) the nature of the instructional development constraints (e.g. time and money). The desired outcomes include: a) the levels of *effectiveness* or the attainment of learning goals, b) *efficiency* or the effectiveness of the instruction in terms of time and cost, and c) *appeal* or the extent to which learners enjoy the instruction and delve further into a topic. It is important to have in mind that instructional-design theories do not describe or predict the amount of learning that will happen when a method of instruction is applied. Instead, instructional-design theories prescribe in which situations which methods of instruction are more appropriate or should be applied most preferably to improve the probability of producing better results.

According to Reigeluth, the Information Age (1999) requires instructional-designs that offer flexible guidelines as to when and how learners should be given initiative, work in teams, work on authentic tasks, choose from a variety of

methods, use advanced technologies, and be allowed to persevere on their own. Instructional-design theories for the information age provided guidelines for learner-centered learning experiences in the domains of human *cognitive* (e.g. understanding, open learning, constructivist learning, collaborative problem-solving, learning communities, self-regulated learning, methods of thinking, instructional transaction, and elaboration theory), *psychomotor*, and *affective* development (e.g. emotional intelligence, attitudinal instruction, virtue, and spiritual development).

According to Reigeluth´s common knowledge approach (& Carr-Chellman, 2009) instructional-design theories should be organized according to their approach to instruction (i.e. direct, discussion, experiential, problem-based, and simulation) and to the desired outcomes of instruction (i.e. fostering skill, understanding, affective development, and integrated outcomes across domains).

3. First Principles of Instruction

Merrill´s (2013, 2002, & 2001) five first principles of instructional design are thought to be essential for an effective, efficient, and engaging acquisition of knowledge or skill in educational and training environments. Merrill distilled these five first principles by analyzing several instructional design theories including: Schwartz's (& Lin, Brophy, & Bransford, 1999) flexibly adaptive instruction, Andre's (1997) instructional episode, Gardner's (1999) multiple approaches to understanding, Nelson's (1999) collaborative problem-solving, Jonassen's (1999) constructivist learning environments, van Merriënboer's (1997, & Kirschner, 2007) cognitive four components of instructional design (4C/ID),

and Schank's (& Berman, & McPherson, 199) Learning by doing.

Merrill's principles (2013, 2002, & 2001) are thought to be relationships that underlie any model or method of instruction and are thought to always be true under appropriate conditions: 1) *Problem or task* centered instruction is the most effective method of instruction (vs. information, demonstration, and application methods), and should involve four phases of learning; 2) *activation* of previous knowledge and skill; 3) *demonstration* of the skill to be learned (or vicarious learning); 4) *application* of the skill by the learner; and 5) *integration* of the skill into the real-world or reflecting on, discussing, and defending the newly acquired skill in a community.

The appropriate conditions of a problem or task centered instruction are provided by simple-to-complex solutions of real-world problems and the guided and explicit comparison of problems. The appropriate activation of previous knowledge entails the recall or acquisition of a mental model, structure or framework that is the basis for guidance, coaching, and reflection. Demonstration requires consistency with the learning goal, guidance to relevant information, multiple representations, and the use of multimedia to implement specifically prescribed instructional events. An appropriate application of the newly acquired knowledge is consistent with what is taught, is supported by opportunities to observe the consequences of one's actions or intrinsic feedback, and demonstrations of how one should have performed an action or corrective feedback, and is supported by a gradually withdrawn coaching or scaffolding that helps the learner use a mental framework, recall previous knowledge, or select the

information that is relevant. An appropriate integration involves the opportunity to realize that one can solve a problem or perform a task that could not be done by proudly demonstrating, reflecting-on, discussing and defending one's work with one's peers.

4. Learning tasks based on complex real-life experiences

Paas, van Merriënboer, and van Gog (2012) consider that learning tasks that are based on complex real-life experiences are the "driving force for learning in the contemporary learning landscape" (p. 335). The learning context described by the authors is one in which "educational services are available on demand and customized for the individual learner" (p. 338), one in which learning should be time and place independent and in technology-rich settings and in which diverse groups of lifelong learners learn in the context of their participation in web-based learning communities or communities of practice.

In this learning landscape what needs to be learned are a) *flexible problem-solving skills* and b) *self-regulated learning skills*. An instructional design that promotes this type of learning should be responsive to each individual and provide an adaptive or flexible design across five ranges or dimensions: 1) well-structured vs. ill-structured problems, 2) domain-specific vs. domain-general competencies, 3) cognitive structure and processes vs. meta-cognitive processes, 4) expert-novice vs. expert to expert performance mappings or observational learning, and 5) specific learning objectives vs. authentic reference situations. Ideally the design should be based on ill-structured problems, domain-general problem solving skills, awareness of one's own knowledge (i.e. the ability to

understand, control, and manipulate one's own cognitive processes), learn by observing amongst equals, and the use of cognitively authentic real-life or whole tasks.

The main principles (van Merriënboer, 1997; Paas, van Merriënboer, & van Gog, 2012) for the design of an instruction that promotes learning flexible problem-solving and self-regulated learning skills from complex real-world tasks are the following: i) sequence task classes to increase in complexity to optimize cognitive load; ii) provide high levels of support or guidance and gradually decrease it; iii) promote germane load by increasing the contextual interference between tasks within each task class, i.e. randomized sequences of different types of learning tasks and spaced stimulus presentations (vs. massed presentations); iv) provide just in time supportive and procedural information, i.e. theories and mental models, cognitive strategies, and procedural information; v) provide sufficient and timely feedback that allows the learners to verify their answers and provides them with information that guides them towards a correct answer on future tasks; and vi) timely prompt learners to reflect with self-explanation and critical-thinking prompts.

According to Paas, van Merriënboer, and van Gog (2012) adjustments in the levels of support and complexity of the learning tasks provide an instruction adapted to learners' levels of prior knowledge. Personalization or customization of the learning experience can be attained by means of: i) *system-controlled* models or instructional agent (human or machine) controlled; ii) *shared responsibility* or system-controlled models that provide learners with the freedom

of choice over a set of recommended tasks; or iii) *advisory* models in which learners receive advice in selecting their learning tasks in higher degrees of responsibility, self-directed or self-regulated learning. Advisory models of personalized instruction can be *procedural* or rule based, *social* or advice based on the other learners successful behaviours, and *meta-cognitive* or advise that helps learners apply cognitive strategies to assess their own performance and develop their self-regulation skills. Meta-cognitive advice is the most desirable type of adaptive, personalized instruction.

CHAPTER 3 ~ Research Design

Methodology

Design is a broad human activity that pursues the question of *how things ought to be* (Fischer, 2013). Design-based research (Reinmann, 2013) is an emerging design and research methodology. This type of research allows educational researchers "to systematically design and develop instructional interventions in authentic settings" (Hung, 2011, p. 159). Design-based innovations embody specific theoretical claims about teaching and learning and help understand the relationships among educational theory, design artefacts, and practice (Design-Based Research Collective, 2003). Design-based research requires significant literature review, uses formative evaluation as a research method, and many data collection and analysis methods (Wang & Hanafin, 2005).

Design and Development Research (Van der Akker, 1999) is a problem-oriented and interdisciplinary type of research that seeks to reduce uncertainty of decision making in designing and developing educational interventions by providing ideas for: a) optimizing the quality of the intervention to be developed; and b) for generating, articulating and testing design principles, substantive or procedural, i.e. how it should look like or how it should be developed.

According to Van der Akker (1999) development research is different from other research approaches, e.g. descriptive, analytical or experimental research, because it focuses on creating a practical and effective intervention for an intended change by successive approximation of interventions, in a preferably constructivist interaction with practitioners. The outcomes or knowledge claims of

development research are *heuristic statements*, i.e. substantive or methodological *design principles* for specific design and development tasks. Van der Akker proposed the following format for these heuristic statements:

> "If you want to design intervention X [for the purpose/function Y in context Z], then you are best advised to give that intervention the characteristics A, B, and C [substantive emphasis], and to do that via procedures K, L, and M [procedural emphasis], because of arguments P, Q, and R." (1999, p. 9).

Development research (1999) is different from professional design and development because of: 1) more extensive and systematic preliminary investigation of the theoretical knowledge, e.g. a literature review; 2) more systematic efforts applying and articulating the theoretical rationale for design choices; 3) empirical evidence about the practicality and effectiveness of the intervention for the intended group in real user settings; and 4) systematic documentation, analysis and reflection throughout the processes of design, development, evaluation and implementation.

Formative evaluation procedures have a central role in development research (Van der Akker, 1999; Plomp, 2007; Nieveen, 2007) and should be integrated in a cycle of analysis, design, evaluation, and revision to contribute to the improvement of an intervention. Formative evaluation in the context of development research gives priority to the richness of information, salience and meaningfulness of suggestions in how to make an intervention stronger, and the efficiency of information, lower costs in time and energy for data collection, processing, analysis and communication; the triangulation of data interpretation methods should be applied to increase certainty. The purpose of formative

evaluation is to improve the quality of the intervention. *Quality* is equivalent to: a) *content validity* or the extent to which the design of the intervention is based on theoretical knowledge; b) *construct validity* or the extent to which the various components of the intervention are consistently linked to each other; c) *practicality* or the extent to which users and other experts consider the intervention as appealing and usable; and d) *effectiveness* or how consistent are the experiences and outcomes of the intervention with the intended aims.

Formative research investigates comprehensive interventions that deal with many interrelated elements at the same time; thus, critical variables are difficult to isolate, manipulate and measure (1999). However, summative evaluation via experimental methods, i.e. design experiments, may be appropriate and feasible when measuring the effectiveness of more mature interventions and larger numbers of students. Generalization of formative research findings cannot be based on statistical techniques. Instead formative research generalizes its findings by facilitating analogy reasoning through: a) clear theoretical articulation of the design principles applied; b) careful description of the evaluation procedures; and c) careful description of the implementation context. Moreover, a larger or ´thicker´ description of the process-in-context may increase the ecological validity of the results.

Kelly (2004), based on Brown´s (1992) and Collins (1999) design research, argued that design research such as development (Van der Akker, 1999) or formative research (Reigeluth & Frick, 1999) does not constitute a logic or scientific methodology. Some of the reasons for this conclusion are that design

research does not have a conceptual structure, i.e. a logos or argumentative grammar, it does not contribute to the problem of demarcation or differentiation of scientific claims and pseudoscience or metaphysical claims, and that its generalizations over actors, behaviours, and context are weak. However, it is in the context of discovery (Phillips, 2006) that researchers display creativity and do much preliminary investigation guided by deep factual and theoretical background knowledge.

Method

The research method entailed the process of creating a practical and effective learning intervention for an EDU 210 Blended Learning Module. The researcher used the development research (Van der Akker, 1999) methodology to optimize the quality of the planned design and the development of the instructional interventions.

Participants and Procedures

The object of analysis was the design and development of the EDU 210 Module 3 Copyright & Intellectual Property instructional intervention. The researcher performed the following development research procedures: 1) build a theoretical framework; 2) articulate a heuristic statement of design principles with the theoretical framework (Van der Akker, 1999, p. 9); 3) design and develop the EDU 210 Module 3 blended learning experience applying the heuristic statement; and 4) evaluate the quality of the planned intervention in terms of its content and construct validity (Van der Akker, 1999; Plomp, 2007; Nieveen, 2007).

Measures and Data Analysis

The researcher evaluated the quality of the planned intervention in terms of its *content validity* or the extent to which the design of the intervention is based on the theoretical framework and heuristic statement, and *construct validity* or the extent to which the various components of the intervention are consistently linked to each other (Van der Akker, 1999; Plomp, 2007; Nieveen, 2007).

Reliability

According to the Design-Based Research Collective (2003), reliability is necessary "to make design-based research a scientifically sound enterprise" (p. 7) and it can be promoted in this type of research through: a) triangulation from multiple data sources, b) repetition of analyses across cycles of enactment, and c) use (or creation) of standardized measures or instruments. Because of its developmental nature, the reliability of this project will depend on future cycles of practical application, and formative and summative evaluation of its results.

Ethical Considerations

The research project, of which this thesis is a part, received research ethics approval from the University of Alberta Research Ethics Board, Project Name "Understanding the uses of Hypermedia in Education", No. Pro00044152, December 16th, 2013.

Limitations

Development research (Van der Akker, 1999) is a design-based research

(Reinmann, 2013) methodology that seeks to define *how things ought to be* not *how things are* (Fischer, 2013). Development research (Van der Akker, 1999) focuses on creating practical and effective interventions for specific design and development tasks by successive approximations. Formative evaluation is an essential part of development research and entails a qualitative evaluation of the validity, practicality and effectiveness of the designed intervention (Van der Akker, 1999; Plomp, 2007; Nieveen, 2007). In the future, the results of this research, i.e. the design of the EDU 210 Module 3 blended instructional intervention, should benefit from evaluating its practicality and effectiveness. The development research methodology (1999) also suggests the possibility of applying summative evaluations via experimental methods once the design of the planned interventions are *mature*, i.e. have been improved through several cycles of formative evaluation. However, generalization of research findings cannot be based on statistical techniques but on a clear theoretical articulation and a careful description of the evaluation and the context of implementation.

CHAPTER 4 ~ Results

Heuristic statement

If one wants to design an *Ethical Digital Citizenship* intervention (X) to promote that preservice teachers reflect on the conventions and responsibilities of digital citizenship (Y) in the context of a blended delivery undergraduate course that examines the frameworks, trends, issues and futuristic scenarios on the role of technology in education (Z) then one is best advised to give that intervention the characteristics of an information age learning experience (A), which promotes an effective, efficient, and engaging acquisition of knowledge or skill (B), and the development of flexible problem-solving and self-regulated learning skills (C), and to do that by: measuring the amount of content delivered online (K); considering the students' internal and external conditions (L) and their attention and motivation (M); designing the instructional activities considering a set of principles (N); fostering immediacy and social presence depending on the medium used for instruction (O); scaffolding self-regulated learning skills (P); fostering collaborative learning and the formation of communities of inquiry (Q); supporting learning with formative and summative assessments (R); and measuring the effectiveness of the learning experience with the students' satisfaction, performance, collaboration, and understanding (S).

Table 1 ~ Instructional Design Heuristic statement

Heuristic Statement	
(X) Design an "Ethical Digital Citizenship" intervention.	
(Y) Promote pre-service teachers to reflect on the conventions and responsibilities of digital citizenship including privacy, intellectual property and copyright.	
(Z) In a University of Alberta blended undergraduate course that examines the frameworks, trends, issues and futuristic scenarios on the role of technology in education.	
Characteristics	**Means**
(A) An information age learning experience	(K) Measure the amount of content delivered online.
(B) Promote effective, efficient, & engaging acquisition of knowledge or skill	(L) Consider the students' internal and external conditions
(C) Promotes the development of flexible problem-solving and self-regulated learning skills	(M) Consider the students' attention and motivation.
	(N) Design the instructional activities considering a set of principles
	(O) Foster immediacy and social presence depending on the medium used for instruction
	(P) Scaffold self-regulated learning skills
	(Q) Foster collaborative learning and the formation of communities of inquiry
	(R) Support learning with formative and summative assessments
	(S) Measuring the effectiveness of the learning experience with the students' satisfaction, performance, collaboration, and understanding

The design of a blended learning intervention

EDU 210 B1 Su14 Introduction to Educational Technology is a six week blended delivery summer course open for 20 senior undergraduate students, preferably B.Ed. and B.Ed. combined degree students (Welch & Fricker, 2014; UofA Office of the Registrar, 2014). Classes and examinations are programmed to run from July 7 to August 15, 2014.

a) The course

Three hours of lecture and three hours of lab time were approved by the Faculty of Education and the UofA Office of the Registrar (2014) for this course. Most of the materials and activities of the course are organized and available for the enrolled students and team of instructors on *eClass*, the University of Alberta Moodle based Learning Management System (LMS). The lecture hours for every module are formally 90 minutes of face-to-face class every Monday and Wednesday and 90 minutes of self-regulated learning with pre and post lecture interactive activities. Interactive Lecture activities are worth 55% of the overall summative evaluation assessed by a Midterm (15%) and a cumulative Final exam (30%), and discussions and pre-lecture activities (10%). Lab time hours are formally three hours of self-regulated hands-on learning activities called Flex Labs. A team of mentors and instructors are available to support these activities Monday to Friday from 8 a.m. to 4 p.m. via face-to-face, chat or phone interactions and 30 minutes demonstration workshops, i.e. Red Chair Demos. Flex Lab activities are worth 45% of the overall summative evaluation. Seven

instructors were required to deliver the course; the researcher was responsible for the design and delivery of two of the ten modules of the course: Module 3 Intellectual Property and Copyright and Module 9 Technology in Learning and Teaching Theories. The course is built around six themes or units delivered through one or more modules so that, by the end of the course, the students attain the following set of outcomes:

Table 2 ~ EDU 210 Units, Modules & Outcomes

Units	**Outcomes**
1. Innovative Professional Practice	1) Articulate and select frameworks that guide their use of technology in education.
2. Ethical Digital Citizenship	2) Understand the role of digital technologies within the teaching profession.
3. Technology Theories and Frameworks	3) Explore and demonstrate the use of technologies that support teaching and learning.
4. Digital Learning Environments	***4) Reflect on the conventions and responsibilities of digital citizenship including privacy, intellectual property and copyright.***
5. Emerging Technologies in Education	5) Begin to develop a philosophy of teaching with technology.

b) The Module

Module 3 - Copyright and Intellectual Property is part of the ethical digital citizenship theme and all of its activities should be directed towards the reflection on the conventions and responsibilities of digital citizenship including privacy, intellectual property and copyright. *To reflect* (2014) on something is *to realize* (2014), i.e. to cause something to become real, to understand or to become aware

of something, and/ or *to consider* (2014), i.e. thinking about or taking into account something carefully in order to make a choice, decision or judgement. The nature of what is to be learned (Reigeluth, 1999) throughout this lecture is the following: Digital citizenship (Ribble, 2014) entails a set of norms of appropriate, responsible behaviour with regard to the use of technology across nine themes: digital access, digital commerce, digital communication, digital literacy, digital etiquette, digital law, digital rights and responsibilities, digital health and wellness, and digital security or self-protection. Then the conceptual schema that will organize this module should be the following:

> To learn how to use Intellectual Property in education entails learning one's rights and responsibilities before the Law and learning to conduct oneself with academic integrity, i.e. learning to conduct legally and ethically when using other people's work in education.

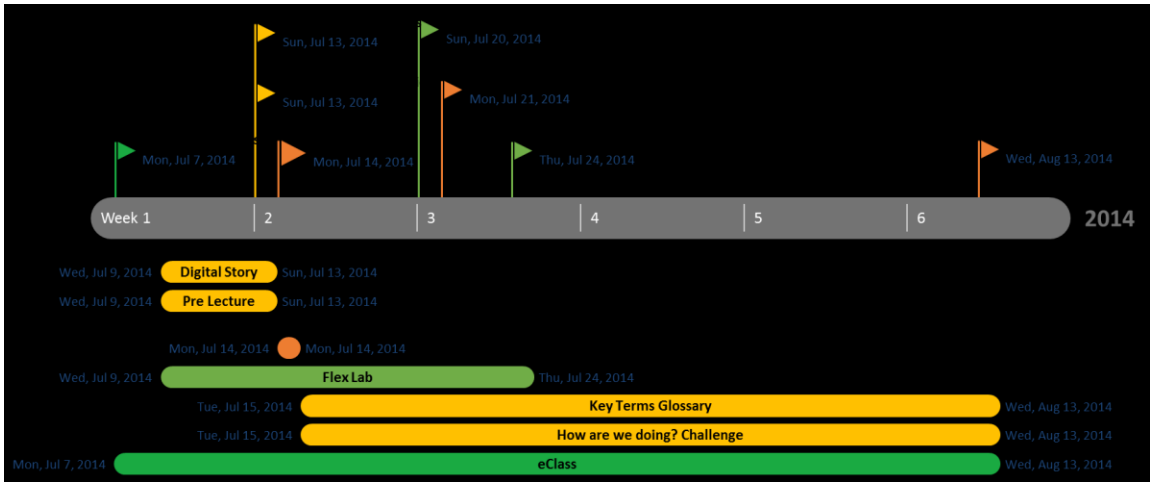
Thus, by the end of the "Intellectual Property, Copyright, and Academic Integrity" lecture the students should be able to:

1. Define intellectual property, copyright, and academic integrity.
2. Recognize key terms related to intellectual property, copyright, and academic integrity.
3. Interpret common intellectual property and copyright issues in education.
4. Apply academic integrity, copyright and intellectual property laws and rules.
5. Evaluate how and when you can use information appropriate and responsibly.
6. Create and use intellectual property and technology within the norms of the appropriate and responsible behaviour of Digital Citizenship.

As mentioned before, the module entails a series of online and face-to-face activities organized into an Interactive Lecture and a Flex Lab. The overall design of the Module should plan for opportunities to attain these outcomes, which in turn should be conducive for a reflection on the conventions and responsibilities

of digital citizenship including privacy, intellectual property and copyright. The following graphic timeline should help visualize all of the Module's planned instructional events and the overall design of the Module:

Figure 2 ~ EDU 210 Module 3 Instructional Events Timeline



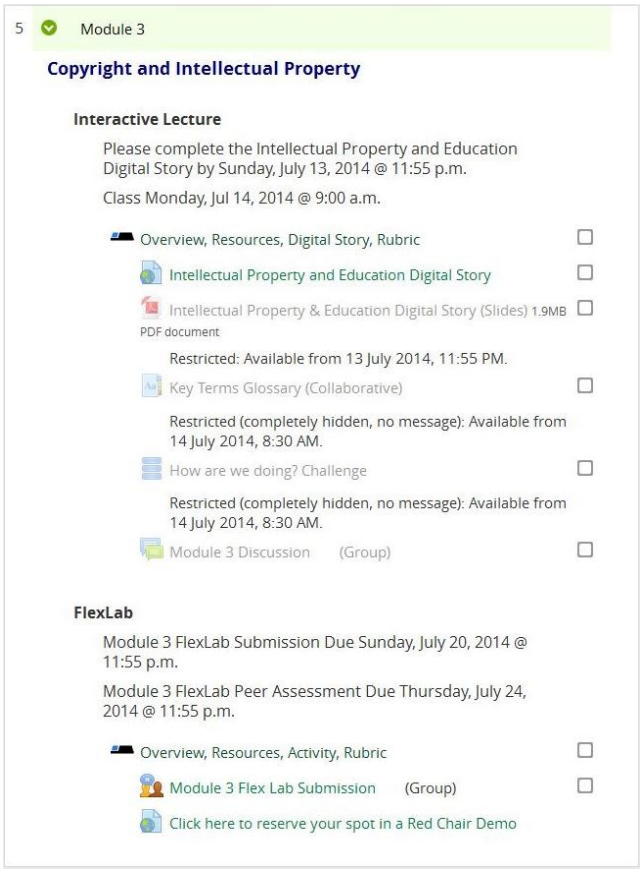
Each task (i.e. horizontal bubble) represents a different instructional event which needs to be internally coherent, i.e. according to the nature of the event (e.g. face-to-face, online, self-regulated or collaborative, etc.) and the principles of design suggested by the theoretical framework, and externally aligned with the purposes of the Module, the Course and the established blended learning framework (i.e. Interactive Lecture and Flex Lab). The instructional events are the following: eClass, the set of materials, instructions and activities available through the Virtual Learning Environment (VLE) from July 7 to August 13; Digital Story, an Articulate Storyline based hypermedia available from the beginning of the course and due July 13; pre lecture resources, a list of texts, multimedia, and tutorials available from the beginning of the course and due before class; Class, a 90 minutes face-to-face classroom interaction; Flex Lab, a

set of digital artefacts that students need to develop and publish on their personal websites (i.e. ePortfolios); Key Terms Glossary, a post lecture collaborative activity designed to reinforce students identification and recall of the key terms; the How are we doing? Challenge, a post lecture activity designed to provide the student's with additional opportunities to apply their new knowledge evaluating the work of the instructional team; and the rubrics, midterm and final exams.

c) eClass, the Virtual Learning Environment (VLE)

The timeline of events informs the organization (i.e. order and hierarchy) and programming of each activity on eClass (*see appendix A & figure 3*). This new design is based on the spring version of the Course (*see appendixes B & C*) and it replaces a written online discussion forum (*see appendix D*) with a hypermedia digital story, and a former guest lecture (*see appendixes I & J*) with a new class plan. This new design also updates several elements: the interactive lecture overview (*see appendixes E & F*), resources (*see appendixes G & H*), and rubric (*see appendix K*), and introduces two new post lecture activities. Originals and markups of these elements of the previous instructional design are available on the aforementioned appendixes. The

Figure 3 ~ EDU 210 Module 3 eClass VLE organization



following table provides a summary of these changes:

Table 3 ~ EDU 210 New Module 3 eClass structure

Module 3 Copyright and Intellectual Property

Interactive Lecture

- Complete the Intellectual Property and Education Digital Story *New*
- Intellectual Property & Education Digital Story (Slides) *New*
- Overview *Updated*
- Resources *Updated*
- Class *New*
- Key Terms Glossary (Collaborative) *New*
- How are we doing? Challenge *New*
- Rubric

FlexLab

- Overview
- Resources *Updated*
- Activity
- Red Chair Demo
- Module 3 FlexLab Submission
- Module 3 FlexLab Peer Assessment
- Rubric

d) Digital story

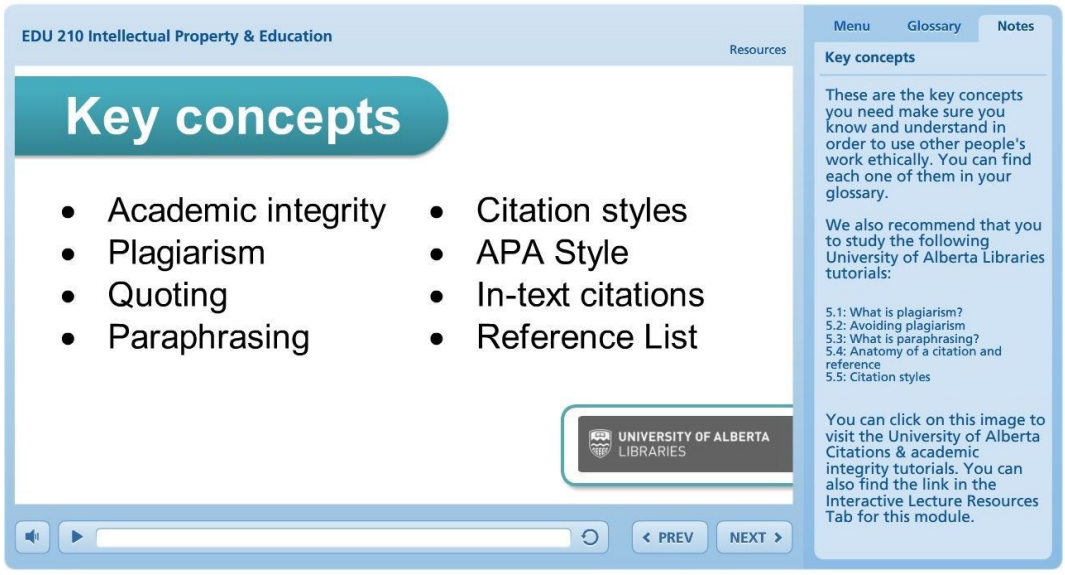
The digital story (*see appendix L* or *see the Digital Story here*) is an Articulate Storyline based hypermedia presentation. The principles of design that inspired this presentation are the Multimedia and Hypermedia Principles of design. The structure of the navigation is mostly linear, however it is programmed to allow the students to control the pace of the lecture and slides are setup to be manually advanced, i.e. will only advance once the students click on the "Next" buttons. There is a main lecture the runs linearly from the beginning to the end (i.e. by only using the *Next* buttons). Five branching options are offered throughout the lecture to enrich the learning experience. Two branching options direct the students to five additional slides in which two examples of copyright

issues are explained within the digital story. Two other options direct the students to external tutorials that should help them learn how to use other people's work ethically and legally, and a fifth option directs to the Reference List which is presented throughout a set of slides within the digital story. All of the aforementioned elements of the story can be observed in the following figure:

Figure 4 ~ Digital Story "Summary" slide

The narrator's script is purposefully short; the narration for the 20 slides of the main lecture section is only 7 minutes and 30 seconds long, with a minimum of 6 and a maximum of 40 seconds per slide. Additionally the narrator's script is available on a "Notes" section within the digital story (*see figure 5*). Images and animations are purposefully programmed to be semantically aligned, i.e. animated to enter or exit the slides synchronized with the narrator's script. Images were setup mainly with two purposes: to provide context, and in this case images were static and are literally the background of what is presented, and to demonstrate the concepts presented, for example the image of a mug or shirt of a copyright

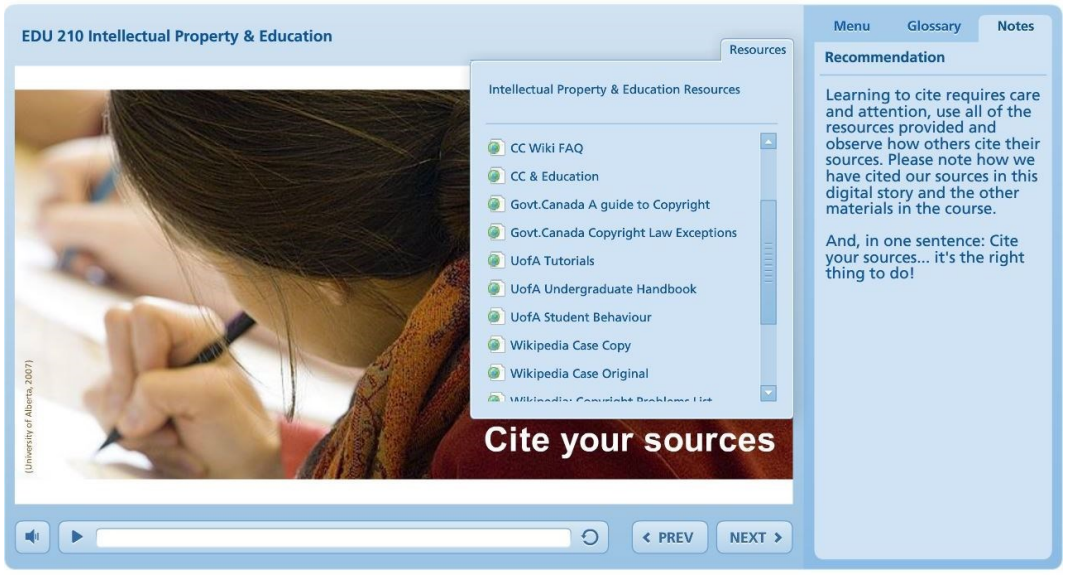
Figure 5 ~ Digital Story Notes section



material appears as the narrator mentions them. The other visual element present in the digital story is text. Within the slides text appears in the form of titles, with large fonts in bold, in the form of subtitles or short sentences to highlight an important concept, or as in-text citations in a small font to model how to acknowledge other people's work.

Figure 6 ~ Digital Story Menu

Figure 7 ~ Digital Story Resources



Additionally, the structure of the Digital Story is available on a "Menu" section which can be used to navigate (i.e. jump to any slide) (*see figure 6*), a set of 18 online resources are available through hyperlinks in a section called "Resources" (*see figure 7*), and a set of 23 key terms and their definitions are listed under the section "Glossary" (*see figure 8*).

Figure 8 ~ Digital Story Glossary

e) Pre-lecture Resources

The redesign of the pre lecture resources tries to align the resources provided with the knowledge schema used throughout the interactive lecture: learning how to use other's people work ethical and legally. It starts with a multimedia story to elicit previous knowledge and frame the topic. Next, it provides three key resources to help introduce the theme and frame the topic: what is digital citizenship, what is the legal framework for copyright, and what is academic integrity. In a third section it directs students to the two tutorials that should help them develop their skills to learn how to use other people's work ethically (i.e. learning when and how to cite), and legally (i.e. learning about copyright licenses and exceptions). Finally, additional resources inherited from the previous design are kept for those students interested in learning more about this topic. The design of the pre lecture resources is the following:

> **Resources**
> Technology continues to invoke a powerful change in the way information and resources are easily accessible online. Teaching and modelling ethical behaviours play key roles in the ongoing promotion, education and expectation of respecting intellectual property and copyright. Within an educational context, copyright and intellectual property is a topic full of complexities. Teaching and modeling ethical behaviours requires teachers to be informed and vigilant. The best way to start being vigilant is becoming informed.
>
> Watch the following video:
>
> - Henry's Story - Making Mashups (2:20 min), and reflect upon your own use and creation of Intellectual Property.
>
> Read the following:
>
> - Nine themes of Digital Citizenship, and think about which themes are related to Intellectual Property, Copyright and Academic Integrity.
> - Fair Dealing and Educational Institutions in the Copyright Act of Canada Bill-C11, and know your rights and responsibilities.
> - Academic Integrity at the University of Alberta on its site, handbook or guide, and learn about plagiarism, appropriate collaboration, and avoiding and preventing cheating.

Work through the following Tutorials:

- Learn how to use other people's work ethically, with academic integrity:
  - Tutorial 5.1 What is plagiarism?
  - Tutorial 5.2 Avoiding Plagiarism
  - Tutorial 5.3 What is paraphrasing?
  - Tutorial 5.4 Anatomy of a citation and reference
  - Tutorial 5.5 Citation styles

- Learn to evaluate how and when you can use information appropriate and responsibly:
  - Can I use it? Interactive presentation

Would you like more resources?

- Canadian Copyright, 7 Key Questions
- Copyright Matters
- Creative Commons Licenses
- Michael Geist blog

f) Class plan

The plan of the class is based on the notion that being present in the same room at the same time with the students is a very important opportunity to provide the student's with an opportunity to experience and put into practice the most important aspects of their recently acquired knowledge and skills. As such this class experience is based on a constructivist perspective but informed by the cognitivist conditions of learning, instructional design for the information age, the first principles of instruction, and the problem-based 4C/ID instructional design. The plan of the class is the following:

1. **Introduction (10 minutes)**

- Welcome interaction: socialized reflection about their coursework (5 minutes)
- Lecture: context and structure of the Class (5 minutes)
  - Lecture: context of the module vs. EDU210 course units & outcomes
  - Lecture: context of the class within the module
    - Expected pre-lecture activities
      - Digital Story & Interactive Lecture Resources

- Class structure
    - Module Outcomes & Planned activities:
        1. Key Terms Glossary
        2. Creators/ consumers
        3. Rate my work
- Activity: Assign a time tracking volunteer

2. Key Terms Glossary (20 minutes)

- Interaction: Any questions from what you studied or read? (5 minutes)
- Activity: List key terms (5 minutes)
- Demo: Explain Key Terms Glossary Activity (10 minutes)

3. Creators/ consumers (25 minutes)

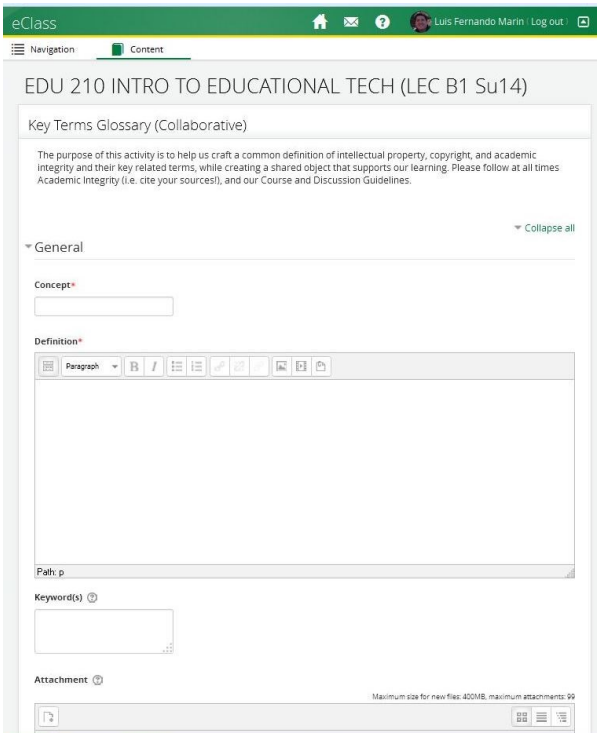
- Activity 1: Are we fair users? (10 minutes)
    - Demo: choose and analyze an object from the Digital Story (5 minutes)
    - Activity: students choose and analyze an object from the Digital Story (5 minutes)
- Activity 2: Deciding for a license (15 minutes)
    - Activity: Help us define our licensing options as creators (5 minutes)
    - Activity: Help us define our potential users/ clients (5 minutes)
    - Activity: Help us think about our rights and obligations if we were someone other than teachers/ designers (5 minutes)
- Demo: Explain How are we doing activity (10 minutes)

4. Summary (5 minutes)

- Lecture: Module Outcomes & Class activities
- Interaction: Q&A

g) Key Terms Glossary collaborative activity

Figure 9 ~ Key Terms Glossary on eClass



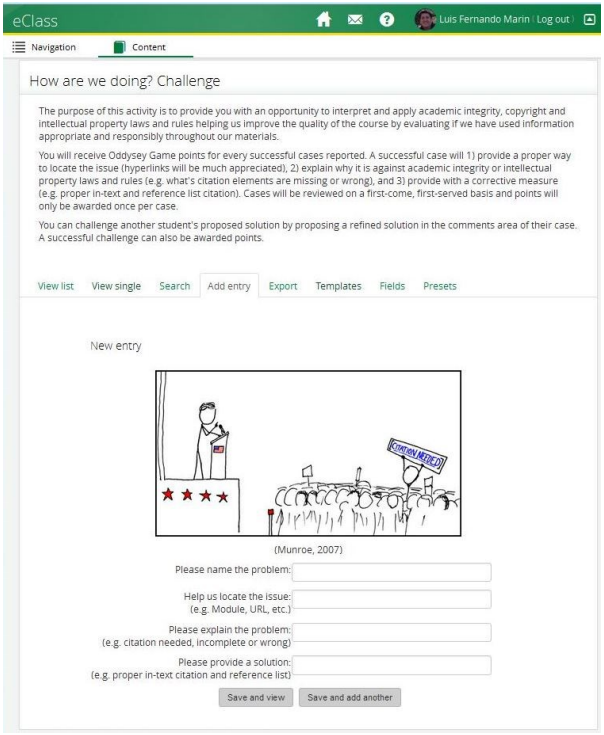
The purpose of this activity is to highlight what is the basic knowledge they students are expected to identify and recall (*see figure 9*). During class the students will craft a list of these key terms and will be invited to use the activity on eClass to provide a definition to each one of the terms. This activity is based on a tool provided by Moodle called *Glossary*. One of the interesting features of this tool is that once a term is proposed it is automatically linked everywhere across the site whenever the concept or the phrased is used by students or instructors in writing. During class one key term will be crafted to demonstrate what type of information is expected. The instructions for this activity are the following:

> The purpose of this activity is to help us craft a common definition of intellectual property, copyright, and academic integrity and their key related terms, while creating a shared object that supports our learning. Please follow at all times Academic Integrity (i.e. cite your sources!), and our Course and Discussion Guidelines.

h) How are we doing? Challenge

The purpose of this activity is to provide the students with an opportunity to challenge their newly acquired knowledge and abilities through a critical examination that should also help improve the materials of the course (*see figure 10*). This activity is based on a tool provided by Moodle called *Database* in which a set of fields can be programmed to receive the student's input. The instructions for this activity are the following:

Figure 10 ~ How are we doing? Challenge on eClass



> The purpose of this activity is to provide you with an opportunity to interpret and apply academic integrity, copyright and intellectual property laws and rules helping us improve the quality of the course by evaluating if we have used information appropriate and responsibly throughout our materials.
>
> You will receive Odyssey Game points for every successful cases reported. A successful case will 1) provide a proper way to locate the issue (hyperlinks will be much appreciated), 2) explain why it is against academic integrity or intellectual property laws and rules (e.g. what's citation elements are missing or wrong), and 3) provide with a corrective measure (e.g. proper in-text and reference list citation). Cases will be reviewed on a first-come, first-served basis and points will only be awarded once per case.
>
> You can challenge another student's proposed solution by proposing a refined solution in the comments area of their case. A successful challenge can also be awarded points.

i) The rubric

The summative evaluation of the knowledge attained during the Interactive Lecture activities, i.e. Digital Story, Pre Lecture Resources, Class, Key Terms Glossary, and the How are we doing? Challenge, will be measured through the completion of the Digital Story, the Midterm and Final Exams multiple option questions related to the topic, and the students' use of the key terms and the citation styles in their Flex Lab activities. However the Rubric for the Interactive Lectures is set to be the following:

	5 marks	**0 marks**
Online Activity Completion	Student completed the digital story/online activity by the deadline provided.	Student did not complete the activity by the deadline provided.

The quality of the planned intervention

The purpose of this section is to evaluate the quality of the design in terms of its validity, i.e. the extent to which the design of the interventions is based on theoretical knowledge and the extent to which the various components of the interventions are consistently linked to each other. The following four sections intend to survey the extent to which the design of the diverse instructional interventions or events follow the principles of: a) the conditions of learning (Gagne, 1965), b) an information age learning experience (Reigeluth, 1999), c) the five principles of instruction (Merril, 2013), and d) learning tasks based on complex real-life experiences (Paas, van Merriënboer, & van Gog, 2012).

a) The conditions of learning

How well does each instructional event favour the conditions of learning, i.e. a rational and systematic alignment of a set of learning processes with a set of instructional events? Although different mediums afford some types of instructional events better than others it is important to recall that Gagné (1965) did not restrict his theory of instruction to a face-to-face lecture type of instruction (p. 283). The following summative evaluation (*see table 4*) is an attempt to survey the explicit presence (i.e. "Yes") of the nine instructional events. The absence (i.e. "No") of an instructional event should be read as an opportunity to improve the quality of the design. The varied affordances of the diverse mediums of instruction may be compensated with the overall scheme of instruction, e.g. the *Key Terms* and *How are we doing? Challenge* post lecture activities could complement the instruction provided by the *Digital Story* and *Pre lecture resources*.

Table 4 ~ The Conditions of learning on EDU 210's designs

Conditions of Learning (Gagne, 1965)	eClass	Digital Story	Pre-lecture	**Class**	Key Terms	Challenge
1. Gaining attention	No	Yes	Yes	**No**	No	No
2. Inform learner of the objective: activate motivation	No	Yes	Yes	**Yes**	Yes	Yes
3. Stimulating recall of prior knowledge	No	Yes	Yes	**Yes**	No	No
4. Present the stimulus material	Yes	Yes	Yes	**Yes**	No	No
5. Provide learning guidance	Yes	Yes	Yes	**Yes**	Yes	Yes
6. Elicit performance	Yes	No	No	**Yes**	Yes	Yes
7. Provide feedback	Yes	No	No	**Yes**	Yes	Yes
8. Assess performance	Yes	No	No	**Yes**	Yes	Yes
9. Enhance retention and transfer	No	No	No	**Yes**	Yes	Yes

b) An information age learning experience

How well does each instructional event foster an information age learning experience? The following summative evaluation (*see table 5)* surveys the presence (i.e. "Yes") or absence (i.e. "No") of the characteristics expected in an information age learning instructional design (Reigeluth, 1999) in the design of each instructional event.

Table 5 ~ The information age design paradigm on EDU 210's designs

Information age design paradigm (Reigeluth, 1999)	eClass	Digital Story	Pre-lecture	**Class**	Key Terms	Challenge
Give initiative (self-direction)	Yes	Yes	Yes	Yes	Yes	Yes
Work in teams	No	No	No	Yes	Yes	No
Work on authentic, real-world tasks	No	No	No	Yes	Yes	Yes
Choose methods	No	No	No	No	No	No
Use Technologies	Yes	Yes	Yes	Yes	Yes	Yes
Allowed to persevere (self-regulated learning)	Yes	Yes	Yes	Yes	Yes	Yes

c) First principles of instruction

How well does each instructional event foster an effective, efficient, and engaging acquisition of knowledge or skill, i.e. attain the five first principles of instruction? The following summative evaluation (*see table 6*) surveys the presence (i.e. "Yes) or absence (i.e. "No") of two elements in the design of the instructional events: the type of instructional strategy (e.g. Level 0, Level 1, etc.) and the principles of instruction (i.e. activation, demonstration, application, and integration). It is important to recall that for Merril (2013) a problem or task-centered instruction is considered to be "the most effective method of instruction" (p. 20), i.e. the third and highest level of effectiveness in comparison with other

instructional strategies which progress from information only (Level 0) to demonstration (Level 1) and application (Level 2).

Table 6 ~ The First Principles of Instruction on EDU 210's designs

First Principles of Instruction (Merril, 2013)	eClass	Digital Story	Pre-lecture	**Class**	Key Terms	Challenge
1. Instructional Strategy						
a. Information only (Level 0)	Yes	Yes	Yes	**Yes**	No	No
b. Demonstration (Level 1)						
Consistent	No	No	No	**Yes**	Yes	Yes
Guidance	No	No	No	**Yes**	Yes	Yes
Multimedia	No	Yes	Yes	**Yes**	No	No
c. Application (Level 2)						
Consistent	No	No	Yes	**Yes**	Yes	Yes
Feedback	No	No	No	**Yes**	Yes	Yes
Coaching	No	No	No	**Yes**	Yes	Yes
d. Problem-centered (Level 3)						
Simple to complex progression	No	No	No	**Yes**	No	No
2. Activation						
Structure	Yes	Yes	Yes	**Yes**	Yes	Yes
5. Integration						
Peer Collaboration	No	No	No	**Yes**	Yes	No
Peer Critique	No	No	No	**Yes**	Yes	No

d) Learning tasks based on complex real-life experiences

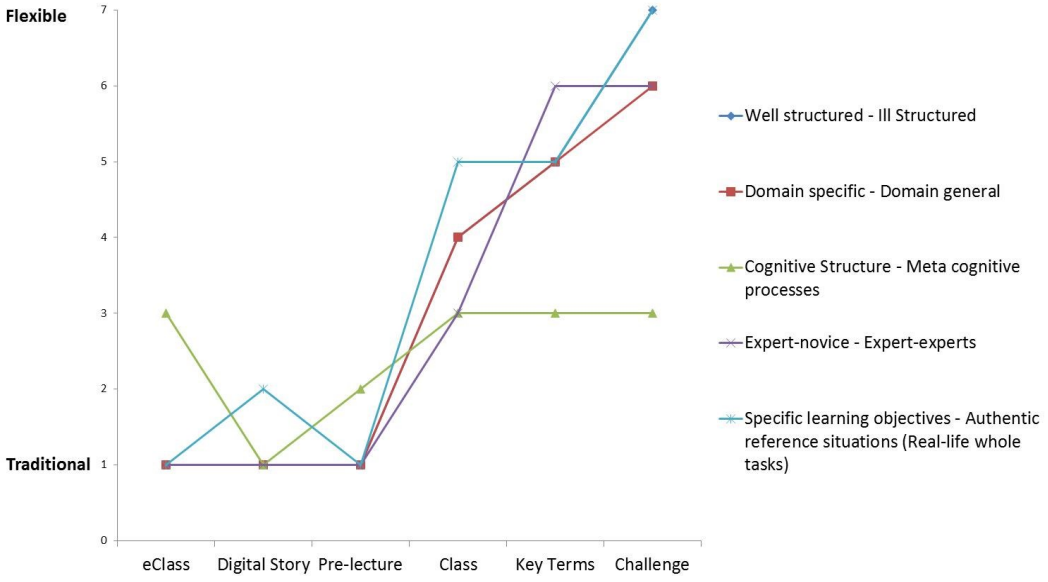
How well does each instructional event foster flexible problem solving and self-regulated learning skills through learning tasks based on complex real-life experiences? According to Paas, van Merriënboer, and van Gog (2012) instructional designs can be characterized in a traditional – flexible design continuum. The following summative evaluations (*see Table 7 and figure 11*) survey the type of instructional design paradigms present on each instructional event using a 1 to 7 Likert scale. Numbers closer to 1 refer to the traditional

paradigm and numbers closer to 7 refer to the flexible paradigm of instruction, which is thought to be more coherent with the *new learning landscape*.

Table 7 ~ Types of instructional design paradigms on EDU 210 designs

Traditional (1)	eClass	Digital Story	Pre-lecture	**Class**	Key Terms	Challenge	**(7) Flexible**
Well structured	1	1	1	4	5	7	Ill-structured
Domain specific	1	1	1	4	5	6	Domain general
Cognitive Structure	3	1	2	3	3	3	Meta cognitive processes
Expert-novice	1	1	1	3	6	6	Expert-experts
Specific learning objectives	1	2	1	5	5	7	Authentic reference situations (Real-life whole tasks)

Figure 11 ~ Types of instructional design paradigms on EDU 210 designs



The framework provided by Paas, van Merriënboer, and van Gog (2012) also helps differentiate part-task from whole-tasks instructional models. The following summative evaluation (*see table 8*) evaluates the type of instructional tasks present in the design of each instructional event using a 1 to 7 Likert scale. Numbers closer to 1 refer to characteristics of part-task models and numbers

closer to 7 refer to characteristics of whole-task models.

Table 8 ~ Types of instructional tasks on EDU 210 designs

Part-task (1)	eClass	Digital Story	Pre-lecture	Class	Key Terms	Challenge	(7) Whole-task
Simple Task	2	2	2	4	6	6	Complex Task
High support	4	4	4	4	5	5	No guidance
Blocked sequence	2	2	2	4	6	6	Random sequence
Massed presentation	6	2	2	4	6	6	Spaced presentation
Theory (before supp. Info)	0	2	2	5	0	0	Theory (JIT supp. info)
Cognitive Strat. (before)	0	0	0	0	0	0	Cognitive Strat. (JIT)
Procedural Info. (before)	2	2	2	4	5	5	Procedural Info. (JIT)
Feedback	2	2	2	5	2	2	Feedback (JIT)
No self-explanation prompts	1	1	1	2	2	2	Self-explanation prompts
No critical thinking prompts	1	1	1	2	2	3	Critical thinking prompts

e) Heuristic statement

How well does each instructional event comply with the means established in the heuristic statement? Since the online interactions constitute 70 to 75% of the authorized instructional content (90 minutes of online pre lecture and 180 minutes of Flex Lab vs. 90 to 120 minutes of face-to-face lecture, demonstrations, and/or mentored assistance) it is fair to say that this can be considered a blended learning experience in terms of the discrete categories established by the SLOAN Consortium (Allen, Seaman, & Garret, 2007, p. 5).

The following summative evaluation (*see table 9)* surveys the presence (i.e. "Yes") or absence ("No") of the means established by the heuristic statement to be conducive for the improvement of the instructional design.

Table 9 ~ Heuristic statement means on EDU 210 designs

Heuristic Statement Means	eClass	Digital Story	Pre-lecture	**Class**	Key Terms	Challenge
K. Measure the amount of content delivered online						
L. Consider the students' internal and external conditions	No	No	No	**Yes**	No	No
M. Consider the students' attention and motivation	No	**Yes**	**Yes**	**Yes**	No	No
N. Design considers a set of principles						
Student-centered	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Problem-based	No	No	No	**Yes**	**Yes**	**Yes**
Social constructivist	No	No	No	**Yes**	**Yes**	No
O. Foster immediacy and social presence	**Yes**	**Yes**	No	**Yes**	No	No
P. Scaffold self-regulated learning skills						
Task analysis capabilities	No	No	No	**Yes**	No	No
Levels of self-motivation	No	No	No	**Yes**	No	No
Cognitive strategies	No	No	No	No	**Yes**	No
Self-observation	**Yes**	No	No	**Yes**	No	No
Self-evaluation	**Yes**	No	No	No	No	No
Causal attributions	No	No	No	No	No	No
Q. Foster collaborative learning and communities of inquiry	**Yes**	No	No	**Yes**	**Yes**	No
R. Assessment						
Formative	**Yes**	No	No	**Yes**	**Yes**	**Yes**
Summative	**Yes**	No	No	**Yes**	No	No
S. Measure the effectiveness of the learning experience						
Satisfaction	No	No	No	No	No	No
Performance	**Yes**	**Yes**	No	No	No	No
Collaboration	No	No	No	No	No	No
Understanding	No	No	No	No	No	No

CHAPTER 5 ~ Discussion

The purpose of this design-based research was to better understand how to optimize the quality of the design of a learning experience in the context of a blended learning higher education course. Development research seeks to define how things ought to be by constructing a theoretical framework, articulating a heuristic statement of design principles, designing a learning experience based on this statement, and evaluating the quality of the design, i.e. its validity, practicality, and effectiveness, in a process of successive approximations.

The context and purpose of the learning experience

Throughout the theoretical discussion the researcher provided a context for 21st Century blended learning experiences that make the best use of media and technology for the development of the students' capacity for making sense of the world relative to their own experiences, i.e. of their subjective understanding. The blended learning experience should not only be defined by the amount of content delivered online but by an instructional emphasis towards the social construction of understanding, i.e. scaffolding the student's abilities and knowledge through focused conversations evoked by synchronous and asynchronous knowledge objects and learning places.

The conditions and states of the learner should be the starting point of an effective instruction. A continuum of different types of instruction derives from the differences between the dependent / information processing or the self-directed world-producing concepts of the individual learner. For a student to be

actively participant in its own learning processes it is necessary that she or he possesses a set of meta-cognitive capabilities and affects, i.e. a cyclical process of cognitive and affective forethoughts, performance, and self-reflection processes. However, the social construction of understanding must not only entail the capacity for self-regulated learning but also the capacity to collaborate and dialogue, a topic which the current theoretical framework left unexplored.

Medium or media are extensions of us and constitute an alteration of the environment to provide an affordance and a certain shape and scale of human association and action. Students and instructors in a blended learning experience ought to be literate or learn to negotiate and navigate the affordances and limitations of many different places and times, i.e. learning environments. Nonetheless, technological developments such as artificially intelligent database assisted learning and increasingly diverse modalities of interaction will still be dependent on purposeful and organized designs of instruction.

Education is the process by which humans seek to pass and preserve a treasured knowledge and/ or to help bring forth an ideal way of being human; the purposefully organized process by which someone teaches something for someone to learn in some context. The contemporary context of technologically mediated learning experiences is philosophical or ideologically an interestingly complex phenomenon for it pursues the aspirations of the holistic approaches to education with or within the technological means of the monist worldview. One of its most extreme expressions proposes that human processes of thinking and learning should be offloaded to technology and corporate organizations in order to

be produced and consumed as commodities. This contemporary context calls for an Education based on complex real-life experiences that foster cooperative relationships, flexible problem solving and self-regulated learning skills.

The key characteristics of the learning experience

Many instructional-design theories have purposefully organized what is known about learning and instruction. Since no practically viable universal and definite programs can be deduced solely from theory, a design-based research provided an opportunity to design and develop a set of specific instructional interventions in the authentic setting of the EDU 210 blended learning experience. The heuristic statement proved to be a useful aid for the construction of a set of contextual and theoretically grounded key characteristics and a set of means to realize them.

The quality of the design

The process of development and improvement of a specific instructional intervention requires a series of successive cycles of analysis, design, evaluation, and revision. The present work allowed for the construction of a theoretical framework specific to the context of a blended delivery undergraduate course. Although it is desirable to provide empirical evidence about the practicality and effectiveness of the instructional designs in real user settings this study evaluated the designs of instruction for their validity, i.e. the extent to which these designs conform to the diverse paradigms described in the theoretical framework.

Rousseau (1762) advised to completely follow any established

instructional method than a better one by halves. The summative revision of the proposed designs for the different EDU 210 Module instructional events revealed that none of them coherently adhere to the expert advice of any of the four instructional frameworks selected or the heuristic statement. If only, the design of the class is presumably most coherent with the five principles of instruction framework. The results of these summative evaluations provide a set of concrete suggestions for the improvement of the different instructional interventions. Specially, the quality of the instructional events should benefit from including explicit forms of gaining attention (*see table 4*), opportunities to work in teams and customize the learning experience (*see table 5)*, and most urgently, the promotion of deep processing or reflection processes through self-explanation and critical thinking prompts and the provision of just in time procedural information, i.e. cognitive strategies (*see table 8*).

The revision of the validity of the instructional designs with the heuristic statement (*see table 9*) exposed the need to revise the designs to explicitly consider the student's internal and external conditions, attention and motivation, scaffold their self-regulated learning skills, and measure the effectiveness of their learning experiences. This evaluation also revealed the need to redesign the heuristic statement to consolidate redundant categories or concepts, and to refine the theoretical framework that supports them, e.g. how to foster collaborative learning and communities of inquiry?

Finally, it was interesting to observe that in terms of the most advanced and desired type of instructional design (e.g. whole-task, flexible, problem-

centered, and self-regulated) the classroom appears to be one of the most favourable environments. It seems like technologically mediated instruction affords larger class sizes but at the cost of larger considerations to benefit from its affordances and compensate for its limitations. Future studies should measure the practicality of each medium of instruction in terms of the aforementioned desired instructional design and the costs of making it feasible with human and technological means.

A number of limitations influence the results of this study. First, a design-based development research does not seek to define how things are but how things ought to be; thus no generalization is possible nor was intended, i.e. the specific instructional interventions designed pertain to the EDU 210 B1 Su14 six week blended delivery summer course offered to 20 B.Ed. senior undergraduate students at the University of Alberta. Second, the formative evaluation neither addressed the practicality nor the effectiveness of the designed intervention in real user settings; it only evaluated the validity of the design in terms of the theoretical framework. Third, there were no successive approximations of interventions, formative evaluations, or a documented constructivist interaction with other EDU 210 instructors or design experts but a single intervention and evaluation based on the researcher´s interpretations, determinations, experiences, and bias. Fourth, the theoretical framework left unexplored how to foster the students' capacity to collaborate and dialogue and how to observe and scaffold their sets of self-regulated learning meta-cognitive capabilities and affects. Fifth, even though the heuristic statement responded to an expert advice that called for an education

based on complex real-life experiences that foster cooperative relationships, flexible problem solving and self-regulated learning skills, there was no critical reflection on how does this type of design afford the students' subjective understanding, and no meta-reflection that could have helped to characterize the type of instruction suggested by the heuristic statement.

As stated at the beginning of this work, the researcher´s long term interest is to realize how to observe the key learning constructs of understanding and collaboration through the data collected from the LMS in order to define how important are each of the learning activities for understanding and collaboration, and to observe how do changes in the design of instruction change the levels of understanding and collaboration. The results of this research, which can be refined by attending to the aforementioned limitations, help progress towards this long-term objective by helping to better understand the ideal characteristics of an instructional design, i.e. what is a good design of teaching, and where, when, how, for what purpose, and for whom can it be said that this good design of teaching happened in the context of a blended learning higher education course. In the future, a refinement of this design framework should help to better observe and evaluate the design of the guided interaction and the performed acts of teaching and learning in terms of students' satisfaction, performance, collaboration, and understanding.

REFERENCE LIST

Abar, B., and Loken, E. (2010). Self-regulated learning and self-directed study in a pre-college sample. *Learning and Individual Differences, 20*, 25-29. doi: 10.1016/j.lindif.2009.09.00210.1016/ j.lindif.2009.09.002.

Adams, C. (2006). PowerPoint, habits of mind, and classroom culture. Journal of Curriculum Studies, 38(4), 389-411.

Adams, C. (2007). On the 'informed use'of PowerPoint: rejoining Vallance and Towndrow. *Journal of Curriculum Studies, 39*(2), 229-233.

Alberta Advanced Education and Technology. (2007, November). *Roles and Mandates Policy Framework for Alberta's Publicly Funded Advanced Education System.* [Online Resource] Retrieved from http://eae.alberta.ca/media/133783/rmpf.pdf

Alexander, P.A., Murphy, P.K., and Greene, J.A. (2012) Projecting Educational Psychology´s Future from its Past and Present: A Trend Analysis. *APA educational psychology handbook, Vol 1: Theories, constructs, and critical issues*. (pp. 3-32). Washington, DC, US: American Psychological Association, xxx, 621 pp. doi: 10.1037/13273-001

Ally, M. (2008) Foundations of Educational Theory for Online Learning. *The Theory and Practice of Online Learning.* Edmonton: AU Press.

Anderson, L.W., and D. Krathwohl (Eds.) (2001). *A Taxonomy for Learning, Teaching and Assessing: a Revision of Bloom's Taxonomy of Educational Objectives.* Longman, New York.

Anderson, T. (2003). Getting the mix right: An updated and theoretical rational for interaction. *International Review of Research in Open and Distance Learning, 4*(2). Retrieved from http://www.irrodl.org/index.php/irrodl/article/view/149/230

Anderson, T. (2008). *The Theory and Practice of Online Learning.* Edmonton: AU Press.

Anderson, T., and Garrison, D.R. (1998). Learning in a networked world: New roles and responsibilities. In C. Gibson (Ed.), *Distance learners in higher education* (pp. 97–112). Madison, WI: Atwood.

Appiah, A. (2008). *Experiments in ethics.* Cambridge, Mass: Harvard University Press.

Aristotle, and Rackham, H. (1934). *Aristotle: 19, The Nicomachean ethics.* Cambridge Mass: Harvard University Press.

Asch, S. E. (1951) Effects of group pressure upon the modification and distortion of judgement. *Groups, leadership and men.* Pittsburgh, PA: Carnegie Press

Asch, S. E. (1956) Studies of independence and conformity: A minority of one against a unanimous majority. *Psychological Monographs, 70* (Whole no. 416)

Asch, S. E. (1966). Opinions and social pressure. *Small groups: Studies in social interaction*, (pp. 318-324). New York: Alfred A. Knopf.

Ausubel, D. (1968). *Educational psychology: a cognitive view / [by] David P.*

Ausubel. New York : Holt, Rinehart and Winston, [1968].

Azevedo, B. F. T., Reategui, E. B., & Behar, P. A. (2010). Qualitative analysis of discussion forums. *International Journal of Computer Information Systems and Industrial Management Applications, 3*, pp. 671-678.

Azevedo, R. R., Cromley, J. G., Moos, D. C., Greene, J. A., and Winters, F. I. (2011). Adaptive Content and Process Scaffolding: A key to facilitating students' self-regulated learning with hypermedia. *Psychological Test And Assessment Modeling*, *53*(1), 106-140.

Azevedo, R., Moos, D. C., Johnson, A. M., and Chauncey, A. D. (2010). Measuring Cognitive and Metacognitive Regulatory Processes during Hypermedia Learning: Issues and Challenges. *Educational Psychologist*, *45*(4), 210-223.

Azevedo, R.R., Cromley, J. G., Winters, F. I., Moos, D. C., and Greene, J. A. (2005). Adaptive Human Scaffolding Facilitates Adolescents' Self-Regulated Learning with Hypermedia. *Instructional Science: An International Journal of Learning and Cognition*, *33*(5-6), 381-412.

Baddeley, A. D., & Hitch, G. (1974). Working memory. *Psychology of learning and motivation, 8*, 47-89.

Bagley, W. C. (1934). *Education and emergent man; a theory of education with particular application to public education in the United States, by William C. Bagley*. New York, T. Nelson and sons, 1934.

Baltes, P. B. (1987). Theoretical propositions of life-span developmental

psychology: On the dynamics between growth and decline. *Developmental Psychology*, 23, 611-626.

Baltes, P. B., and Smith, J. (2008). The Fascination of Wisdom: Its Nature, Ontogeny, and Function. *Perspectives On Psychological Science*, (1), 56. doi:10.1111/j.1745-6916.2008.00062.x

Baltes, P. B., Reuter-Lorenz, P., and Rösler, F. (2006). *Lifespan development and the brain [electronic resource]: the perspective of biocultural co-constructivism / edited by Paul B. Baltes, Patricia A. Reuter-Lorenz, Frank Rösler.* Cambridge; New York: Cambridge University Press, 2006.

Bandura, A. (1986). The explanatory and predictive scope of self-efficacy theory. *Journal of Social and Clinical Psychology,* 4(3), 359-373.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York, NY: Freeman.

Bandura, A. (2001). Social Cognitive Theory of Mass Communication. *Media Psychology, 3*:3, 265-299. doi: 10.1207/S1532785XMEP0303_03

Bandura, A., and Schunk, D. H. (1981). Cultivating competence, self-efficacy, and intrinsic interest through proximal self-motivation. *Journal of Personality and Social Psychology, 41*, 586-598. doi: 10.1037/0022-3514.41.3.58610.1037/0022-3514.41.3.586.

Bandura, A., and Walters, R. H. (1963). *Social learning and personality development / [by] Albert Bandura [and] Richard H. Walters*. New York, Holt, Rinehart and Winston [1963].

Bateson, G. (2000). *Steps to an ecology of mind / Gregory Bateson*. Chicago, Ill.: University of Chicago Press, 2000.

Bell, C.R., Margolis, F.H. (1978) Blending Didactic and Experiential Learning Methods. *Training & Development Journal, 32* (8).

Bers, M. U., Ponte, I., Juelich, C., Viera, A., and Schenker, J. (2002). Teachers as Designers: Integrating Robotics in Early Childhood Education. *Information Technology in Childhood Education Annual*, *2002* (1), 123-145.

Biggs, J.B. and Collis, K.F. (1982). *Evaluating the Quality of Learning: the SOLO Taxonomy*. New York: Academic Press.

Bloom, B., and Krathwohl, D. R. (1956). *Taxonomy of educational objectives: the classification of educational goals / by a committee of college and university examiners.* New York: Longmans, Green, 1956-.

Borges, J.L. (1962) *Ficciones*. (A. Kerrigan, A. Bonner, A. Reid, H. Temple, and R. Todd, Trans.). New York, NY: Grove Press. (Original work published 1956)

Boulton-Lewis, G. (1998). Applying the SOLO taxonomy to learning in higher education. In B. Dart and G. Boulton-Lewis, ed., *Teaching and Learning in Higher Education*, pp. 201-221, Victoria, Australia: ACER Press.

Bronfenbrenner, U. (1977).Toward an experimental ecology of human development. *American Psychologist*, 23, 419-427.

Bronfenbrenner, U. (1979). *The Ecology of Human Development: Experiments by*

Nature and Design. Cambridge, Mass: Harvard University Press.

Bronfenbrenner, U. (2005). *Making human beings human: bioecological perspectives on human development / Urie Bronfenbrenner, editor*. Thousand Oaks: Sage Publications, c2005.

Brown, J., and Adler, R. P. (2008). Minds on Fire: Open Education, the Long Tail, and Learning 2.0. EDUCAUSE Review, 43(1), 16-20,22,24,26,28,30,32.

Bruner, J. S. (1960). *The process of education / Jerome S. Bruner.* Cambridge: Harvard University Press, 1960.

Bruner, J. S. (1966). *Toward a theory of instruction / by Jerome S. Bruner.* Cambridge, MA: Belknap Press of Harvard University, 1966.

Bruner, J. S. (1986). *Actual minds, possible worlds / Jerome Bruner.* Cambridge, MA: Harvard University Press, 1986.

Buck, G. H. (1992). *Instructional Devices: Development, Learning Theories, and Deployment* (Doctoral dissertation). University of Alberta, Edmonton

Buck, G. H. (2009). Far Seeing and Far Reaching: How the Promise of a Distance Technology Transformed a Faculty of Education. *Journal of Distance Education, 23*(3), 117-132.

Burri, M., Baujard, V., & Etter, J. (2006). A qualitative analysis of an Internet discussion forum for recent ex-smokers. *Nicotine & Tobacco Research*, 813-19. doi:10.1080/14622200601042513

Bush, V. (1945). As we may think. *Atlantic (01606506)*, *176,* pp. 101-108.

Butler, G., and McManus, F. (2000). *Psychology: a very short introduction / Gillian Butler and Freda McManus.* Oxford ; New York: Oxford University Press, 2000.

Carr, D. (2006) Philosophy of History. In Borchert, D. M. (ed.). *Encyclopedia of philosophy* [ebook] (pp. 386-399). Detroit, Mich.: Macmillan Reference USA.

Carson, S. (2005a). Eudaimonia. In Borchert, D. M. (ed.). *Encyclopedia of philosophy* [ebook] (pp. 10-12). Detroit, Mich.: Macmillan Reference USA.

Carson, S. (2005b). Phronêsis. In Borchert, D. M. (ed.). *Encyclopedia of philosophy* [ebook] (pp. 27-28). Detroit, Mich.: Macmillan Reference USA.

Castells, M. (1996). Rise of the Network Society in Charles Lemert (ed.) (2010). *Social Theory: The Multicultural and Classic Readings*, 4th ed. Boulder: Westview Press. pp. 620-624.

Chatterton, R.H. (1941). Methods of Lesson Observing by Pre-service Student-teachers. *Contributions to Education, No. 834*. New York: Bureau of Publications, Teachers College, Columbia University, 1941.

Cicciarelli, M. (2008). A Description of Online Instructors Use of Design Theory. *International Journal of Information and Communication Technology Education (IJICTE)*, 4(1), 25-32. doi:10.4018/jicte.2008010103

Coleman, M., and Gallagher, J. J. (1995). The successful blending of gifted

education with middle schools and cooperative learning: Two studies. *Journal for the Education of the Gifted, 18*(4), 362-384.

Consider. (2014). In *Dictionary and Thesaurus - Merriam-Webster Online*. Retrieved from http://www.merriam-webster.com/dictionary/consider

Dale, E. (1969). *Audiovisual methods in teaching / Edgar Dale.* New York: Dryden Press, 1969.

Deleeuw, K., and Mayer, R. (2008). A Comparison of Three Measures of Cognitive Load: Evidence for Separable Measures of Intrinsic, Extraneous, and Germane Load (English). *Journal of Educational Psychology*, *100*(1), 223-234.

Design-Based Research Collective. (2003). Design-based research: An emerging paradigm for educational inquiry. *Educational Researcher*, 32(1), 5–8.

Dewey, J. (1938). *Experience and education, by John Dewey.* New York : The Macmillan Co., 1938.

Dewey, J., and Small, A. (1897). *My pedagogic creed, by Prof. John Dewey; also, The demands of sociology upon pedagogy, by Prof. Albion W. Small.* New York, Chicago, E.L. Kellogg & co. [c1897].

Dougiamas, M. (2014) Moodle, philosophy. [Online] Retrieved from http://docs.moodle.org/26/en/Philosophy

Downes, S. (2012). *Connectivism and Connective Knowledge. Essay on meaning and learning networks*. [eBook]. Retrieved from http://www.downes.ca/files/books/Connective_Knowledge-

19May2012.pdf

Dron, J. (2007). *Control and constraint in e-learning: Choosing when to choose.* Hershey, PA: Information Science Pub.

Drucker, P. (2003). *A Functioning Society: selections from sixty-six years of writing on community, society, and polity.* New Brunswick, N.J.: Transaction Publishers.

Drysdale, J. S., Graham, C. R., Spring, K. J., and Halverson, L. R. (2013). An analysis of research trends in dissertations and theses studying blended learning. *The Internet and Higher Education*, *90*. doi:10.1016/j.iheduc.2012.11.003

Dzuiban, C., Hartman, J., and Moskal, P. (2004). Blended learning. *EDUCAUSE Centre for Applied Research (ECAR) Research Bulletin. 2004 (7)*, 1-12. Retrieved from: http://net.educause.edu/ir/library/pdf/erb0407.pdf

Fahy, P. (2008) Characteristics of Interactive Online Learning Media. *The Theory and Practice of Online Learning.* Edmonton: AU Press.

Freire, P. (1970). *Pedagogy of the oppressed / Translated by Myra Bergman Ramos.* [New York] : Seabury Press, [c1970].

Gagné, R. (1965). *The conditions of learning [by] Robert M. Gagné.* New York, Holt, Rinehart and Winston [1965].

Gagné, R., and Gagné, R. (1985). *The conditions of learning and theory of instruction / Robert M. Gagné*. New York: Holt, Rinehart and Winston, c1985.

Garrison, R. and Vaughan, N. (2008). *Blended learning in higher education: Framework, principles and guidelines.* San Francisco: Josey-Bass.

Genette, G., Newman, C., Doubinsky, C., and Prince, G. (1997). *Palimpsests [electronic resource]: literature in the second degree / Gérard Genette ; translated by Channa Newman & Claude Doubinsky ; foreword by Gerald Prince*. Lincoln: University of Nebraska Press, c1997.

Gentile, D. A., Anderson, C. A., Yukawa, S., Ihori, N., Saleem, M., Ming, L. K., and Sakamoto, A. (2009). The effects of prosocial video games on prosocial behaviors: International evidence from correlational, longitudinal, and experimental studies. *Personality and Social Psychology Bulletin*. *35*, 6, pp. 752-763. doi: 10.1177/0146167209333045

Gibson, J. (1979). *The ecological approach to visual perception / James J. Gibson.* Boston: Houghton Mifflin, c1979.

Goodman, N. (1984). *Of mind and other matters / Nelson Goodman.* Cambridge, Mass.: Harvard University Press, 1984.

Government of Alberta, Department of Education (2013). Ministerial Order (#001/2013) Student Learning [Online Resource] Retrieved from http://www.education.alberta.ca/media/6950988/mostudentlearning.pdf

Graham, S., and Weiner, B. (2012). Motivation: Past, present, and future. *APA educational psychology handbook, Vol 1: Theories, constructs, and critical issues*. (pp. 367-397). Washington, DC, US: American Psychological Association, xxx, 621 pp. doi: 10.1037/13273-013

Greene, J., Bolick, C., and Robertson, J. (2010). Fostering historical knowledge and thinking skills using hypermedia learning environments: The role of self-regulated learning. *Computers & Education, (1),* 230. doi:10.1016/j.compedu.2009.08.006

Grimm, S. (2012). 'The Value of Understanding'. *Philosophy Compass,* (2), 103. doi:10.1111/j.1747-9991.2011.00460.x

Hacker, D. J., Dunlosky, J., and Graesser, A. C. (2009). *Handbook of metacognition in education / edited by Douglas J. Hacker, John Dunlosky, Arthur C. Graesser.* New York: Routledge, 2009.

Harris, D. B. (1957). Problems in formulating a scientific concept of development. In D. B. Harris (Ed.), *The concept of development* (pp. 3-13). Minneapolis: University of Minnesota Press.

Hebb, D. O. (1949). *The organization of behaviour: a neuropsychological theory /.* New York: Wiley, 1949.

Hebb, D. O. (2002). *The organization of behaviour [electronic resource]: a neuropsychological theory / D.O. Hebb.* Mahwah, N.J.: L. Erlbaum Associates, c2002.

Herman, E., and Chomsky, N. (1990). Manufacturing consent: The political economy of the mass media. *The American Journal of Islamic Social Sciences*. [Journal] US: Pantheon Books.

Herrington, J. and Oliver, R. (1999). Using Situated Learning and Multimedia to Investigate Higher-Order Thinking. *Journal of Interactive Learning*

Research, 10(1), 3-24. Charlottesville, VA: AACE.

Hirsch Jr., E. D. (1983). Cultural Literacy. *American Scholar, 52*(2), 159.

Hirsch Jr., E. D. (1996). *The schools we need and why we don't have them / E.D. Hirsch, Jr.* New York, NY : Doubleday, c1996.

Hirsch Jr., E. D., Kett, J. F., and Trefil, J. S. (1988). *Cultural literacy: What every American needs to know.* Random House LLC.

Hosp, J. (2012) Using Assessment Data to make Decisions about Teaching and Learning. *APA educational psychology handbook, Vol 3: Application to Learning and Teaching*, pp. 87-110. Washington, DC, US: American Psychological Association, xxx, 668 pp. doi: 10.1037/13275-005

Hummel, C. (1993). Aristotle (384-322 B.C.). *PROSPECTS: the quarterly review of comparative education*, vol. 23, no. 1/2, pp. 39-51. Paris: UNESCO, International Bureau of Education. Retrieved from http://www.ibe.unesco.org/fileadmin/user_upload/archive/publications/ThinkersPdf/aristote.pdf

Hung, H. (2011). Design-Based Research: Designing a Multimedia Environment to Support Language Learning. *Innovations in Education and Teaching International, 48*(2), 159-169. doi: 10.1080/14703297.2011.564011

Hutchins, R. M. (1962). *The higher learning in America (Vol. 55)*. Transaction Publishers.

Hutchins, R. M. (1969). *The Learning Society.* New York: Frederick A. Praeger, Publishers

Ifenthaler, D. (2012). Learning Management System. *Encyclopedia of the sciences of learning.* pp. 1925-1927. S.l: Springer. doi 10.1007/978-1-4419-1428-6_187

Jahng, N. (2013). Collaboration indices for monitoring potential problems in online small groups. *Canadian Journal of Learning & Technology, 39*(1), 1.

Jahng, N., Nielsen, W. S., and Chan, E. H. (2010). Collaborative Learning in an Online Course: A Comparison of Communication Patterns in Small and Whole Group Activities. *Journal of Distance Education, 24*(2), 39-58.

James, W. (1899). *Talks To Teachers On Psychology; And To Students On Some Of Life's Ideals*. [eBook] New York: Henry Holt. Retrieved from http://www.gutenberg.org/ebooks/16287

Jaques, D. (2003). Teaching small groups. *BMJ, 326*(7387), 492-494.

Jaques, D., and Salmon, G. (2007). *Learning in groups: A handbook for face-to-face and online environments*. Routledge.

Johnson, D.W., and Johnson, R.T. (2009). Energizing learning: The instructional power of conflict. *Educational Researcher, 38*, 37-51. doi:10.3102/0013189X08330540

Jonassen, D. H., and Rohrer-Murphy, L. (1999). Activity Theory as a Framework for Designing Constructivist Learning Environments. *Educational Technology Research And Development*, (1), 61. doi:10.2307/30220230

Jonassen, D.H. (1999). Designing constructivist learning environments. In C. M.

Reigeluth (Ed.). *Instructional-design theories and models: A new paradigm of instructional theory (Vol. 2*), pp. 215-239. Mahwah, NJ: Lawrence Erlbaum Associates.

Kanuka, H. and Smith, E. (2013) Why is reflecting on our beliefs important? Abstract from the 2013 SHRCE: *Society for Research into Higher Education Annual Research Conference.* [Online Resource] Wales, UK: SHRCE.

Keegan, D. (1986). *Foundations of Distance Education*. 2nd Edition. London: Routledge.

Kerres, M., and de Witt, C. (2003). A didactical framework for the design of blended learning arrangements. *Learning, Media and Technology,* 28(2 & 3), 101–113.

Kilpatrick, W. H. (1926). *Education For a Changing Civilization.* New York: Macmillan.

Kinsley, P. (1967). Philosophy of Education, History of. *Encyclopedia of philosophy* [ebook] (pp. 364-380). Detroit, Mich.: Macmillan Reference USA.

Kitchin, R. M. (1994). Cognitive maps: What are they and why study them?. *Journal of environmental psychology, 14*(1), 1-19.

Knowles, M. (1980). *The modern practice of adult education: from pedagogy to andragogy / Malcolm S. Knowles*. Wilton, Conn.: Association Press; Chicago: Follett Pub. Co., c1980.

Koolhaas, J., Bartolomucci, A., Buwalda, B., de Boer, S., Flügge, G., Korte, S., and ... Fuchs, E. (2011). Stress revisited: a critical evaluation of the stress concept. *Neuroscience And Biobehavioral Reviews*, 35(5), 1291-1301. doi:10.1016/j.neubiorev.2011.02.003

Kuhn, T. (2012). The Structure of Scientific Revolutions (50th Anniversary Edition). *British Journal For The Philosophy Of Science*, *63*(4), 859-883.

Laurillard D. (1997) Ch. 11 in F. Marton, D. Hounsell, and N. Entwistle*, The Experience of Learning: Implications for Teaching and Studying in Higher Education*. Edinburgh: Scottish Academic Press.

Le Moal, M. (2007). Historical approach and evolution of the stress concept: a personal account. *Psychoneuroendocrinology*, 32 Suppl 1S3-S9.

Lerner, R. M. (2006). Developmental science, developmental systems, and contemporary theories of human development. In W. Damon and R.M. Lerner (Series Eds.), R. M. Lerner (Vol. Ed.), *Handbook of child psychology: Vol. 1. Theoretical models of human development* (6th ed., pp.1-17). New York: John Wiley & Sons.

Li, F., & Du, T. C. (2011). Who is talking? An ontology-based opinion leader identification framework for word-of-mouth marketing in online social blogs. *Decision Support Systems, 51*(1), 190-197.

Lipman, M. (1991). *Thinking in Education.* Cambridge: Cambridge

Locke, J. (1764) *Some thoughts concerning education (13 ed.).* [eBook] London: Millar, Woodfall. Retrieved from

https://openlibrary.org/books/OL23705150M/Some_thoughts_concerning_education

Lowyck, J. (2014). Bridging Learning Theories and Technology-Enhanced Environments: A Critical Appraisal of Its History. *Handbook of Research on Educational Communications & Technology, 3*. doi:10.1007/978-1-4614-3185-5_1

Marra, R. M., Moore, J. L., and Klimczak, A. K. (2004). Content analysis of online discussion forums: A comparative analysis of protocols. *Educational Technology Research and Development, 52*(2), 23-40.

Martin, B., & Ringham, F. (2006). *Key terms in semiotics / Bronwen Martin and Felizitas Ringham.* London; New York: Continuum, c2006.

Maslow, A. H. (1943). A theory of human motivation. *Psychological review, 50*(4), 370.

Maslow, A. H. (1966). *The psychology of science : a reconnaissance / by Abraham H. Maslow. Foreword by Arthur G. Wirth*. New York : Harper & Row, [1966].

Maturana, H. R., and Varela, F. J. (1992). *The tree of knowledge: the biological roots of human understanding / Humberto R. Maturana and Francisco J. Varela; translated by Robert Paolucci; foreword by J.Z. Young*. Boston: Shambhala; New York: Distributed in the U.S. by Random House, 1992.

Mayer, R. E. (2001). *Multimedia learning*. New York: Cambridge University Press.

Mayer, R., and Moreno, R. (2003). Nine ways to reduce cognitive load in multimedia learning. *Educational Psychologist*, *38*(1), 43-52.

McCulloch, W., and Pitts, W. (1943). A logical calculus of the ideas immanent in nervous activity. *Bulletin of Mathematical Biophysics, 5(4)*, 115-133. doi:10.1007/BF02478259

McLuhan, M. (1962). *The Gutenberg Galaxy : The Making of Typographic Man.* Toronto: University of Toronto Press.

McLuhan, M. (1964). *Understanding media: the extensions of man / by Marshall McLuhan.* New York: McGraw-Hill, 1964.

McRae, P., Adams, C., Buck, G., and Thompson, T. (2007). Innocuous tools, or double-edged swords? Philosophical and practical tensions of digital technologies. *Proceedings of the the American Education Research Association (AERA) annual conference.* Chicago, IL: AERA.

Menn, S. (2005). Aristotle (384 BCE-322 BCE). *Encyclopedia of philosophy* [ebook] (pp.263-282). Detroit, Mich.: Macmillan Reference USA.

Merrill, M. (2001). First Principles of Instruction. *Journal of Structural Learning & Intelligent Systems, 14*(4), 459.

Merrill, M. (2002). First principles of instruction (English). *Educational Technology Research and Development, 50*(3), 43-59.

Merrill, M. (2013). *First principles of instruction [electronic resource]: identifying and designing effective, efficient, and engaging instruction / M. David Merrill*. San Francisco, CA: Pfeiffer.

Montessori, M. (1966). *The discovery of the child / by Maria Montessori ; translated by Mary A. Johnstone.* Thiruvanmiyur, India : Kalakshetra Publications, c1966.

Montessori, M. (1967). *To educate the human potential*. Kalakshetra Publications.

Moodle.org (2014, March 4) About Moodle. [Online resource] Retrieved from http://docs.moodle.org/26/en/About_Moodle

Moore, M. G. (1989). Three types of interaction. *American Journal of Distance Education,* 3(2), 1–6.

Moskal, P., Dziuban, C., and Hartman, J. (2013). Blended learning: A dangerous idea? *The Internet and Higher Education*, *15*. doi:10.1016/j.iheduc.2012.12.001

Myint, S. K., and Lourdusamy, A. (2003). Blended learning approach in teacher education: combining face-to-face instruction, multimedia viewing and online discussion (English). *British Journal of Educational Technology*, 34(5), 671-675.

Nadler, D. A, and Ancona, D.(1992) Teamwork at the top: creating executive teams that work. *Organizational architecture: designs for changing organizations.* San Francisco, CA: Jossey-Bass, 209-231.

Nelson, T.H. (1965) A file structure for the complex, the changing and the indeterminate. In: *Proceedings of the 20th National ACM Conference, ACM,* pp. 84- 100

Nelson, T.H. (1987) . *Literary Machines*. South Bend, IN: The Distributors.

Newman , R. S. (2007). The motivational role of adaptive help seeking in self-regulated learning. *In D. H. Schunk B. J. Zimmerman (Eds.), Motivation and self-regulated learning: Theory, research, and applications*, pp. 315-338. New York, NY: Erlbaum.

Newman, J. (1873). *The idea of a university.* London : B.M. Pickering, 1873.

Nielsen, J. (1990). *Hypertext and Hypermedia*. Boston: Academic Press.

Noddings, N. (1992). *The Challenge to Care in Schools: An Alternative Approach to Education. Advances in Contemporary Educational Thought, Volume 8*. New York, NY: Teachers College Press, Columbia University.

Noddings, N. (2005). What Does It Mean to Educate the Whole Child?. *Educational leadership, 63*(1), 8-13.

Noddings, N., and Shore, P. J. (1984). *Awakening the Inner Eye. Intuition in Education*. New York, NY: Teachers College Press, Columbia University.

Owston, R., York, D., and Murtha, S. (2013, July). Student perceptions and achievement in a university blended learning strategic initiative. *The Internet and Higher Education, 18*, 38-46. Retrieved from http://dx.doi.org/10.1016/j.iheduc.2012.12.003

Ozcinar, Z. (2009). The topic of instructional design in research journals: A citation analysis for the years 1980-2008. *Australasian Journal of Educational Technology*, 25(4), 559-580.

Paas, F., van Merriënboer, J. G., and van Gog, T. A. J. M. (2012). Designing instruction for the contemporary learning landscape. *APA Educational*

Psychology Handbook: Vol. 3. Application to Learning and Teaching. Doi:10.1037/13275-013

Papert, S. (1980). *Mindstorms: children, computers, and powerful ideas.* New York: Basic Books.

Patrick, H., Mantzicopoulos, P., and Sears, D. (2012). Effective Classrooms. *APA Educational Psychology Handbook: Vol. 2. Individual Differences and Cultural and Contextual Factors*. Doi:10.1037/13274-018

Piaget, J., and Inhelder, B. (1969). *The psychology of the child / Jean Piaget and Bärbel Inhelder; translated from the French by Helen Weaver*. London: Routledge and Kegan Paul [1969].

Pintrich, P. R. (2000). Multiple goals, multiple pathways: The role of goal orientation in learning and achievement. *Journal of Educational Psychology, 92*, pp. 544-555. doi: 10.1037/0022-0663.92.3.54410.1037/0022-0663.92.3.544.

Plato, and Lamb, W. R. M. (1925). *Lysis: Symposium ; Gorgias.* Cambridge, Mass: Harvard University Press.

Plato, and Shorey, P. (1935). *The Republic: Books VI-X.* Cambridge, Mass: Harvard University Press.

Plato, Emlyn-Jones, C. J., and Preddy, W. (2013). *Republic. Books I-V*. Cambridge, Mass: Harvard University Press.

Plato, Fowler, H. N., Lamb, W. R. M., Bury, R. G., and Shorey, P. (1914). *Plato.* Cambridge, Mass: Harvard University Press.

Pond, W. (2002). Twenty-first century education and training implications for quality assurance (English). *The Internet And Higher Education, 4*(3-4), 185-192. Retrieved from http://www.qou.edu/arabic/researchProgram/eLearningResearchs/twentyFirst.pdf

Postman, N. (1990, October, 11). Informing ourselves to death. Speech at the German Informatics Society. [Electronic Resource] Stuttgart. Retrieved April 22, 2013 from http://w2.eff.org/Net_culture/Criticisms/informing_ourselves_to_death.paper

Postman, N. (2006). Amusing ourselves to death: Public discourse in the age of show business. USA: Penguin. Retrieved April, 22, 2013, from http://floatingworldweb.com/@EBOOKS/@PDF/ESSAYS/Amusing%20Ourselves%20to%20Death.pdf

Realize. (2014). In *Dictionary and Thesaurus - Merriam-Webster Online*. Retrieved from http://www.merriam-webster.com/dictionary/realize

Reffay, C., and Martínez-Monés, A. (2013). Basic concepts and techniques in social network analysis. *Handbook of Design in Educational Technology*, 448-456.

Reflect (2014). In *Dictionary and Thesaurus - Merriam-Webster Online*. Retrieved from http://www.merriam-webster.com/dictionary/reflect

Reigeluth, C. M. (1983). *Instructional-design Theories and Models.* Hillsdale,

N.J.: Lawrence Erlbaum Associates.

Reigeluth, C. M. (1999). *Instructional-design theories and models. Volume II, A new paradigm of instructional theory / edited by Charles M. Reigeluth.* Mahwah, N.J.: Lawrence Erlbaum Associates, 1999.

Reigeluth, C., and Carr-Chellman, A. (2009). *Instructional-design theories and models. Volume III.* New York: Routledge.

Reimann, P. (2013) Design-based Research – Designing as Research. *Handbook of Design in Educational Technology*, pp. 44-52). New York: Routledge.

Resnick, L. (1987). *Education and learning to think*. Washington, DC: National Academy.

Resnick, M., Bruckman, A., and Martin, F. (1996) Pianos not stereos: Creating computational construction kits. *Interactions, 3*(6), pp. 41-50.

Ribble, M. (2014) Nine Themes of Digital Citizenship [Online resource]. Retrieved from http://www.digitalcitizenship.net/Nine_Elements.html

Rieber, L. (1996). Seriously considering play: Designing interactive learning environments based on the blending of microworlds simulations, and games (English). *Educational Technology Research and Development, 44*(2), pp. 43-58.

Roehrig, A.D., Turner, J.E., Arrastia, M.C., Christensen, E., McElhaney, S., and Jakiel, L.M. (2012) Effective Teachers and Teaching: Characteristics and Practices Related to Positive Student Outcomes. *APA educational psychology handbook, Vol 2: Individual differences and Cultural and*

Contextual Factors. Washington, DC: American Psychological Association. doi: 10.1037/13274-020

Rogers, C. R. (1951). *Client-centered therapy: Its current practice, implications and theory.* London: Constable.

Rogers, C. R. (1969). *Freedom to learn : a view of what education might become / Carl R. Rogers.* Columbus, Ohio : C.E. Merrill Pub. Co., [1969].

Rogoff, B. (1998). Cognition as a collaborative process. In W. Damon (Series Ed.) and D. Kuhn and R.S. Siegler (Vol. Eds.), *Handbook of child psychology: Vol. 2. Cognition, perception, and language* (5th ed., pp. 679-744). New York: Wiley.

Rorty, R. (1982). *Consequences of pragmatism: Essays, 1972-1980*. U of Minnesota Press.

Rorty, R. (1989). *Contingency, irony, and solidarity.* Cambridge University Press.

Rorty, R., Williams, M., & Bromwich, D. (1980). *Philosophy and the Mirror of Nature (Vol. 401).* Princeton, NJ: Princeton University Press.

Ross, K. (1998). Blending authentic work projects and instructional assignments: An adaptation process (English). *Educational Technology Research And Development, 46*(3), 67-79.

Rourke, L., Anderson T., Garrison, D. R., and Archer, W. (2001). Assessing social presence in asynchronous text-based computer conferencing. *Journal of Distance Education* 14(2).

Rousseau, J. (1762). *Émile, ou, de l'éducation / par J.J. Rousseau.* A Amsterdam:

Chez Jean Néaulme, 1762.

Rovai, A. P. and Barnum, K. T. (2003). Online course effectiveness: An analysis of student interactions and perceptions of learning. *Journal of Distance Education,* 18(1), 57–73.

Ruffini, M. F. (1999). The impact of undergraduate preservice teachers' use of hypermedia to review lecture notes. Journal of Research on Computing in Education, 31(3), 292.

Scheibe, S., Kunzmann, U., and Baltes, P. B. (2009). New Territories of Positive Life-Span Development: Wisdom and Life Longings. *The Oxford Handbook Of Positive Psychology*, doi:10.1093/oxfordhb

Schunk, D. H. (1984). Sequential attributional feedback and children's achievement behaviors. *Journal of Educational Psychology, 76*, pp. 1159-1169. doi: 10.1037/0022-0663.76.6.115910.1037/0022-0663.76.6.1159.

Schunk, D. H. (2008). Attributions as motivators of self-regulated learning. *In D. H. Schunk B. J. Zimmerman (Eds.), Motivation and self-regulated learning: Theory, research, and applications*, pp. 245-266. New York, NY: Erlbaum.

Schunk, D. H. (2012) Social cognitive theory. *APA educational psychology handbook, Vol 1: Theories, constructs, and critical issues.* (pp. 101-123). Washington, DC, US: American Psychological Association, xxx, 621 pp. doi: 10.1037/13273-005

Schwab, J. J. (1978). *Science, curriculum, and liberal education: Selected essays*

(I. Westbury & N. J. Wilkof, Eds.). Chicago, IL: University of Chicago Press.

Seifert, T. (2004). Understanding student motivation (English). *Educational Research (Windsor)*, *46*(2), 137-149.

Seok, S. (2008). Teaching aspects of E-learning. *International Journal on ELearning, 7*(4), 725-741. Retrieved from http://login.ezproxy.library.ualberta.ca/login?url=http://search.proquest.com/docview/210328224?accountid=14474

Sherman, J., and Bisanz, J. (2009). Equivalence in symbolic and non-symbolic contexts: Benefits of solving problems with manipulatives. *Journal of Educational Psychology*, 101, 88-100.

Shields, C.W. (1860) Memorial of Joel Jones, L.L.D. *The Theological and Literary Journal [ed. by D.N. Lord], 13. New York*: Franklin Knight. Retrieved from http://books.google.ca/books?id=b_zQAAAAMAAJ

Shim, S.S.Y., Atreya, S.D., Wesley, L.P. and Booth, R.P. (1999). ROADS: An Environment for Developing Automated Intelligent Agents to Suppport Distance Learning. *Journal of Interactive Learning Research, 10*(3), 321-333. Charlottesville, VA: AACE.

Short, J.A., Williams, E., and Christie, B. (1976). *The social psychology of telecommunications.* New York: John Wiley and Sons.

Skinner, B. F. (1968). *The technology of teaching [by] B. F. Skinner*. Englewood Cliffs, N.J.: Prentice-Hall.

Skinner, B.F. (1954). The science of learning and the art of teaching. *Harvard Educational Review, 24*(2), pp. 86-97.

Slavkin, M. (2004). *Authentic learning: How learning about the brain can shape the development of students.* Lanham, MD: Scarecrow Education.

Stefanakis, E. and Peterson, M. (2006) Geographic Hypermedia. In Stefanakis, E. (2006). *Geographic hypermedia [electronic resource]: concepts and systems / Emmanuel Stefanakis ... [et al.] (eds.)*. Berlin ; New York: Springer, c2006.

Steiner, R. (1965). *The education of the child : in the light of anthroposophy / Rudolf Steiner.* London : Rudolf Steiner Press, 1965.

Stiegler, B. (2012). Relational ecology and the digital pharmakon. *Culture Machine*, 13, pp. 1-19.

Suhrie, A. (1923). Pre-service training of teachers. *National Education Association. Proceedings & Addresses*, p. 1006, 1923

Swartz, D. (2007) Education, culture, and Social Inequality. *Culture and Power. The Sociology of Pierre Bourdieu.* The University of Chicago Press.

Sweller, J. (2012) Human cognitive architecture: Why some instructional procedures work and others do not. *APA educational psychology handbook, Vol 1: Theories, constructs, and critical issues*. (pp. 295-325). Washington, DC, US: American Psychological Association, xxx, 621 pp. doi: 10.1037/13273-011

Sweller, J., van Merriënboer, J. G., and Paas, F. C. (1998). Cognitive Architecture

and Instructional Design. *Educational Psychology Review*, (3), 251.

Tanis, M. (2003). *Cues to Identity in CMC. The impact on Person Perception and Subsequent Interaction Outcomes.* Thesis University of Amsterdam. Enschede: Print Partners Ipskamp.

Taylor, J. (2001). The future of learning – learning for the future: Shaping the transition. *Proceedings of the 20th ICDE World Congress.*

Taylor, P. and Maor, D. (2000). Assessing the efficacy of online teaching with the Constructivist On-Line Learning Environment Survey. In A. Herrmann and M.M. Kulski (Eds), Flexible Futures in *Tertiary Teaching. Proceedings of the 9th Annual Teaching Learning Forum, 2-4 February 2000*. Perth: Curtin University of Technology. http://lsn.curtin.edu.au/tlf/tlf2000/taylor.html

Taylor, P., Maor, D. and Dougiamas, M. (2001) Monitoring the development of a professional community of reflective inquiry via the World Wide Web. In: *Teaching and Learning Forum 2001: Expanding Horizons in Teaching and Learning, 7 - 9 February 2001*, Curtin University, Perth.

Tennyson, R., Schott, F., Seel, N., and Dijkstra, S. (1997). *Instructional design: International perspective: Theory, research, and models.* (Vol.1). Mahwah, NJ: Lawrence ErlbaumAssociates.

The Juridical Writings of Sir James Mackintosh. The History of England, by The Right Hon. Sir James Mackintosh, M.P. (1836) *The American Jurist and Law Magazine, 14.* Boston: Freeman & Bolles, 1836. Retrieved from

http://books.google.ca/books?id=UwmoAAAAIAAJ

The Straussian Myth - The Voices of the Church. (1845) *The Christian reformer; or, Unitarian magazine and review [ed. by R. Aspland], 1.* London: Sherwood, Gilbert, and Piper; and J. Chapman. Retrieved from http://books.google.ca/books?id=khsEAAAAQAAJ

Tickton, S. G. (1970). *To improve learning; an evaluation of instructional technology. Edited by Sidney G. Tickton with the staff of the Academy for Educational Development, Inc.* New York: R. R. Bowker Co., 1970-.

Tinker, M. A. (1942). Review of 'Methods of lesson observing by pre-service student-teachers'. *Journal of Educational Psychology*, 33(3), 232-233. doi:10.1037/h0049914

Turkle, S. (2011). *Always on. In Alone Together*. New York, NY: Basic Books. pp. 151-170

University of Alberta (2013) Promise [Online Resource]. Retrieved from http://uofa.ualberta.ca/promise

University of Alberta, Center for Teaching and Learning (CTL) (2014, April 4) Blended Learning. What is Blended Learning? [Online Resource] Retrieved from http://www.ctl.ualberta.ca/instructional-resources/blended-learning

University of Alberta, Center for Teaching and Learning (CTL) (2014, April 17). About eClass. [Online] Retrieved from http://ctl.ualberta.ca/technology-services/eClass

University of Alberta, Department of Educational Psychology (2014) About Us. [Online] Retrieved from http://www.edpsychology.ualberta.ca/en/AboutUs.aspx

University of Alberta, Faculty of Education (2014) The Faculty of Education. In University of Alberta, Office of the Registrar. *Calendar 2014-2015* [Online Resource] Retrieved from http://www.registrar.ualberta.ca/calendar/Undergrad/Education/Faculty/70.html

University of Alberta, Office of the Registrar (2014) Office of the Registrar. *Calendar 2014-2015* [Online Resource] Retrieved from http://www.registrar.ualberta.ca/calendar/

Vallance, M., & Towndrow, P. A. (2007). Towards the 'informed use'of information and communication technology in education: a response to Adams''PowerPoint, habits of mind, and classroom culture'. *Journal of Curriculum Studies, 39*(2), 219-227.

van den Akker, J. (1999). Principles and methods of development research. In J. van den Akker, N. Nieveen, R. M. Branch, K. L. Gustafson & T. Plomp (Eds.), *Design methodology and developmental research in education and training* (pp. 1–14). The Netherlands: Kluwer Academic Publishers.

van Merriënboer, J. G. (1997). *Training complex cognitive skills: a Four-Component Instructional Design model for technical training / Jeroen J.G. van Merriënboer.* Englewood Cliffs, N.J.: Educational Technology

Publications.

van Merriënboer, J. G., & Kirschner, P. A. (2007). *Ten steps to complex learning*. Mahwah, NJ: Lawrence Erlbaum Associates.

van Merriënboer, J. G., and de Bruin, A. H. (2014). Research Paradigms and Perspectives on Learning. *Handbook of Research on Educational Communications & Technology, 21*. doi:10.1007/978-1-4614-3185-5_2

Vaughan, N. D., Garrison, D. R., and Cleveland-Innes, M. M. (2013). *Teaching in blended learning environments: creating and sustaining communities of inquiry / Norman D. Vaughan, Martha Cleveland-Innes, and D. Randy Garrison* [Electronic resource]. Edmonton: AU Press.

Vygotsky, L. S. (1978). Mind in society: The development of higher psychological processes. Cambridge, MA.: Harvard University Press.

Vygotsky, L. S., and Kozulin, A. (2011). The Dynamics of the Schoolchild's Mental Development in Relation to Teaching and Learning. *Journal of Cognitive Education and Psychology, 10(2)*, pp. 198-211. doi:10.1891/19458959.10.2.198

Vygotsky, L.S. (1966) Genesis of the higher mental functions. In Woodhead, M., Carr, R., and Light, P. (1991). *Child development in social context, Vol. 2 Learning to Think*. London ; New York: Routledge in association with the Open University, 1991.

Wang, F., and Hanafin, M.J. (2005). Design-based research and technology-enhanced learning environments. *Educational Technology Research and*

Development, 53(4), 5–23.

Weiner, B. (2004). Attribution theory revisited: Transforming cultural plurality into theoretical unity. *Big theories revisited, 4*, 13-29.

Welch, J. and Fricker, S.(2013, November) EDU 210: Introduction to Educational Psychology Winter 2014 Course Syllabus – On Campus Section. [eClass Resource] Retrieved from https://eclass.srv.ualberta.ca/pluginfile.php/1220727/mod_resource/content/12/EDU210X57LECF2FSyllabusWinter2014.pdf

Wenger, E., R. McDermott, R. and W. Snyder, W. (2002). *Cultivating communities of practice: A guide to managing knowledge.* Cambridge, MA: Harvard Business School Press.

Wilson, B. G., Peck, K. L., and Jonassen, D. H. (1999). *Learning with technology: a constructivist perspective.* United States of America: Merrill.

Wolters, C. (2003). Regulation of motivation: Evaluating an underemphasized aspect of self-regulated learning. *Educational Psychologist*, *38*(4), 189-205.

Wood, D. D. (1991) Aspects of teaching and learning. In Light, P., Sheldon, S., & Woodhead, M. (Eds.), *Learning to Think. Child Development in Social Context 2: a reader / edited by Paul Light, Sue Sheldon, and Martin Woodhead*. London ; New York: Routledge.

Zenger, J., and Uehlein, C. (2001). Why blended will win. *T+D, 55*(8), 54-60.

Zimmerman, B. J. (1986). Development of self-regulated learning: Which are the

key subprocesses? *Contemporary Educational Psychology,* 11, 307-313. doi: 10.1016/0361-476X(86)90027-510.1016/0361-476X(86)90027-5.

Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts P. R. Pintrich M. Zeidner (Eds.), *Handbook of self-regulation,* (pp. 13-39). San Diego, CA: Academic Press. doi: 10.1016/B978-012109890-2/50031-710.1016/B978-012109890-2/50031-7.

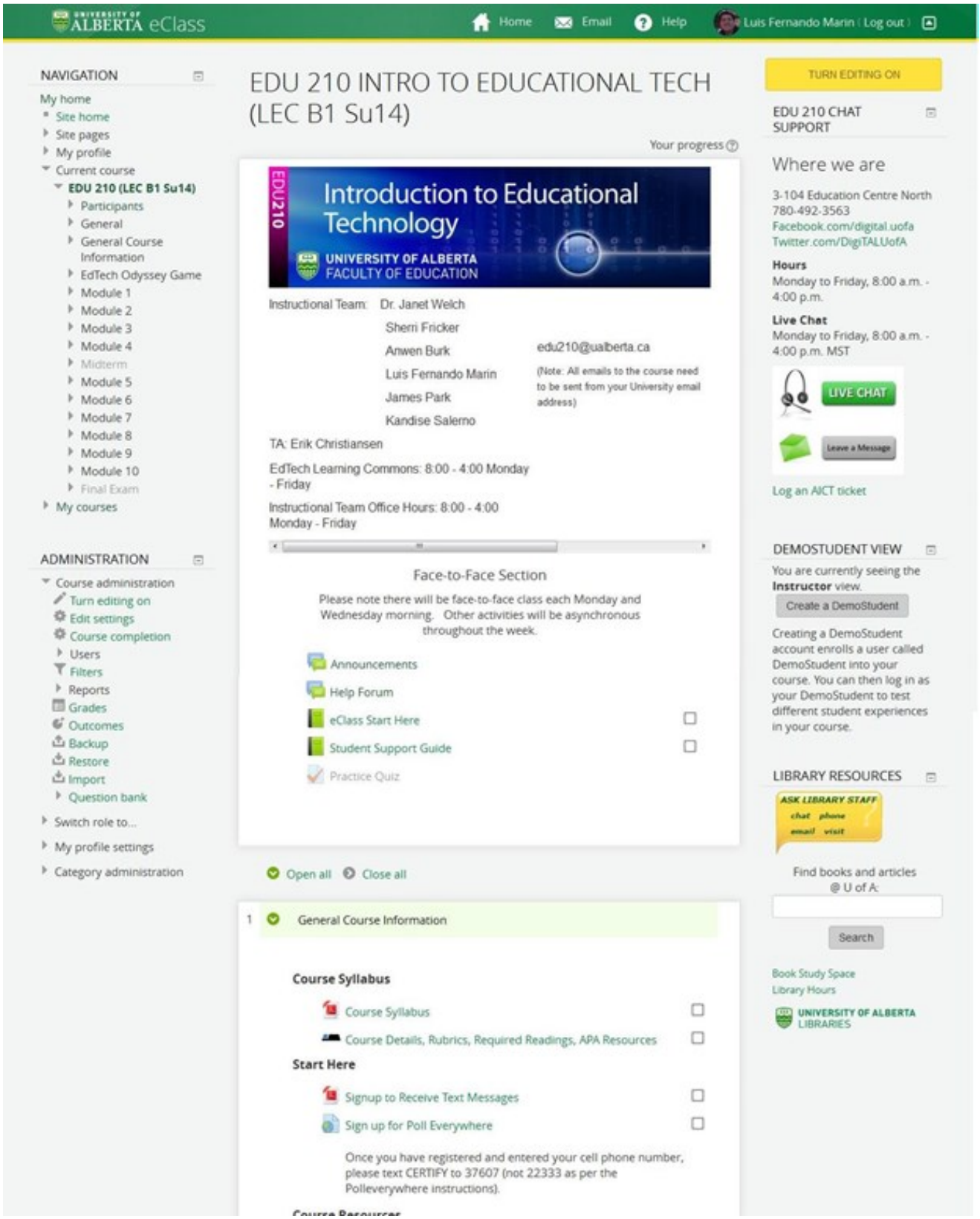
Zimmerman, B. J. (2008). Goal setting: A key proactive source of academic self-regulation. In D. H. Schunk B. J. Zimmerman (Eds.), *Motivation and selfregulated learning: Theory, research, and applications*, (pp. 267-295). New York, NY: Erlbaum.

Zimmerman, B. J., and Bandura, A. (1994). Impact of selfregulatory influences on writing course attainment. *American Educational Research Journal, 31*, 845-862. doi: 10.2307/1163397

Zimmerman, B. J., and Labuhn, A. S. (2012). Self-regulation of learning: Process approaches to personal development. *APA educational psychology handbook, Vol 1: Theories, constructs, and critical issues.* Washington, DC: American Psychological Association. doi: 10.1037/13273-014

APPENDIXES

Appendix A ~ EDU 210 (LEC B1 Su14) on eClass



Appendix B ~ EDU 210 Spring 2014 Module 3 Structure

EDU 210 Introduction to Educational Technology (LEC A1 SP14)

Course Units

1. Innovative Professional Practice
2. ***Ethical Digital Citizenship***
3. Technology Theories and Frameworks
4. Research and Perspectives on Technology
5. Digital Learning Environments
6. Emerging Technologies in Education

Course Outcomes

1. Articulate and select frameworks that guide their use of technology in education.
2. Understand the role of digital technologies within the teaching profession.
3. Explore and demonstrate the use of technologies that support teaching and learning.
4. ***Reflect on the conventions and responsibilities of digital citizenship including privacy, intellectual property and copyright.***
5. Begin to develop a philosophy of teaching with technology.

Module 3 Copyright and Intellectual Property

Interactive Lecture

- Complete a questionnaire
- Overview
- Resources
- Discussion Questions
- Class (Guest Lecture)
- Resources from Guest Lecture
- Module 3 Discussion Post
- Module 3 Replies to Discussion Posts
- Rubric

FlexLab

- Overview
- Resources
- Activity
- Red Chair Demo
- Module 3 FlexLab Submission
- Module 3 FlexLab Peer Assessment
- Rubric

Appendix C ~ EDU 210 Spring 2014 eClass Structure (with markup)

EDU 210 Introduction to Educational Technology (LEC B1 Su14)

Course Units

1. Innovative Professional Practice
2. ***Ethical Digital Citizenship***
3. Technology Theories and Frameworks
4. Research and Perspectives on Technology
5. Digital Learning Environments
6. Emerging Technologies in Education

Course Outcomes

1. Articulate and select frameworks that guide their use of technology in education.
2. Understand the role of digital technologies within the teaching profession.
3. Explore and demonstrate the use of technologies that support teaching and learning.
4. ***Reflect on the conventions and responsibilities of digital citizenship including privacy, intellectual property and copyright.***
5. Begin to develop a philosophy of teaching with technology.

Module 3 Copyright and Intellectual Property

Interactive Lecture

- Complete the Intellectual Property and Education Digital Story
- Intellectual Property & Education Digital Story (Slides)
- Overview
- Resources
- Class ~~(Guest Lecture)~~
- Key Terms Glossary (Collaborative)
- How are we doing? Challenge
- Rubric

FlexLab

- Overview
- Resources
- Activity
- Red Chair Demo
- Module 3 FlexLab Submission
- Module 3 FlexLab Peer Assessment
- Rubric

Appendix D ~ EDU 210 Spring 2014 Discussion Forum Instructions

Discussion Questions

Please read the discussion board guidelines before posting your first post. Readings should be completed before engaging in the discussion.

For this module, you will be responsible for at least **one** initial discussion post and **multiple** replies within the discussion groups.

Your initial post for this module must be made by ***Thursday at midnight*** and two replies to posts from others in your group must be done by ***Sunday at midnight***.

Discussion Question Option 1

Decolonization and Indigenous Intellectual Property Rights
Background and Introduction: As Indigenous scholars and authors have been working to promote traditional understandings and cultures, they have also exposed the biased histories which have been written about their people—or, more often, simply excluding the reality of the displacement of Indigenous people by the forces of colonialism. The efforts to advance traditional values and understandings while exposing the hidden curriculum of colonialism has been termed " de-colonization." Indigenous communities have used the Internet, cd rom production, and independent filmmaking to inform their own communities and the broader global audience about traditions, stories, and ways of making meaning from their own traditional perspectives. In this way they are countering a history of oppression and learning their own thoughts in contrast to the colonizer's thoughts.

In your discussion group, answer this question or one of the questions based on the scenario below.

1. Indigenous peoples are diverse, but they share the common experience of being colonized by western and imperialist powers. Can technology be useful in supporting Indigenous communities' efforts to de-colonize values and thoughts?

Discussion Question Option 2

Scenario: As a teacher, you have a great learning activity that involves the lyrics to a song. Since you're not a big fan of the artist, you don't want to buy a whole CD for a single teaching activity. However, you would like to be able to download the song in digital format and bring it in for your students, but you also don't want to do anything illegal or unethical.

In your discussion group, answer one of the following questions:

1. If you could find the song on iTunes, would it be legal to bring that purchased version into the classroom to play for your students? Why or why not?
2. What if you found that a fan had posted the song on YouTube, could you share that video in class with your students legally and/or ethically? Why or why not?

Note that sources are very important in answering the discussion questions this week. We don't just want to know what you think the answers to these questions are; we want to see sources to back up your claims.

In your initial discussion post for this module indicate which question you are answering. Please remember that your initial post for this module must be made by ***Thursday at midnight*** and two replies to other posts in this module must be done by ***Sunday at midnight***.

Interactive Lecture: Intellectual Property & Copyright

Appendix E ~ EDU 210 Spring 2014 Interactive Lecture Overview

Resources

Technology continues to invoke a powerful change in the way information and resources are easily accessible online. Teaching and modelling ethical behaviours play key roles in the ongoing promotion, education and expectation of respecting intellectual property and copyright. Within an educational context, copyright and intellectual property is a topic full of complexities. Teaching and modeling ethical behaviours requires teachers to be informed and vigilant. The best way to start being vigilant is becoming informed.

Watch the following video:

- Respecting Creative Work Video vignette: Henry's Story (3:02 min)

Using the new Copyright Act of Canada Bill-C11, review intellectual property and copyright law for your discussion questions. You may want to research other online resources as well:

- Michael Geist blog
- Canadian Copyright, 7 Key Questions
- Copyright Matters
  Noel, W., & Snel, J. (2012). *Copyright matters!* (1st ed.). [Toronto]: Council of Ministers of Education, Canada ; [Montréal].

Appendix F ~ EDU 210 Spring 2014 Interactive Lecture Overview (with markup)

Resources

Technology continues to invoke a powerful change in the way information and resources are easily accessible online. Teaching and modelling ethical behaviours play key roles in the ongoing promotion, education and expectation of respecting intellectual property and copyright. Within an educational context, copyright and intellectual property is a topic full of complexities. Teaching and modeling ethical behaviours requires teachers to be informed and vigilant. The best way to start being vigilant is becoming informed.

Watch the following video:

- Henry's Story - Making Mashups (2:20 min), and reflect upon your own use and creation of Intellectual Property.
- ~~Read Respecting Creative Work Video vignette: Henry's Story (3:02 min)~~

~~Using~~ the following:

- Nine themes of Digital Citizenship, and think about which themes are related to Intellectual Property, Copyright and Academic Integrity.
- Fair Dealing and Educational Institutions in the ~~new~~ Copyright Act of Canada Bill-C11 ~~Bill-C11~~, and know your rights and responsibilities.
- Academic Integrity at the University of Alberta on its site, handbook or guide, and learn about plagiarism, appropriate collaboration, and avoiding and preventing cheating.

Work through the following Tutorials:

- Learn how to use ~~review intellectual property and copyright law for your discussion questions. You may want to research~~ other people's work ethically, with academic integrity:
  - Tutorial 5.1 What is plagiarism?
  - Tutorial 5.2 Avoiding Plagiarism
  - Tutorial 5.3 What is paraphrasing?
  - Tutorial 5.4 Anatomy of a citation and reference
  - Tutorial 5.5 Citation styles
- Learn to evaluate how and when you can use information appropriate and responsibly:
  - Can I use it? Interactive presentation

Would you like more ~~online~~ resources? ~~as well:~~

- Canadian Copyright, 7 Key Questions
- Copyright Matters
- Creative Commons Licenses
- Michael Geist blog

Interactive Lecture: Intellectual Property, ~~&~~ Copyright & Academic Integrity

Appendix G ~ EDU 210 Spring 2014 Interactive Lecture Resources

Resources

Technology continues to invoke a powerful change in the way information and resources are easily accessible online. Teaching and modelling ethical behaviours play key roles in the ongoing promotion, education and expectation of respecting intellectual property and copyright. Within an educational context, copyright and intellectual property is a topic full of complexities. Teaching and modeling ethical behaviours requires teachers to be informed and vigilant. The best way to start being vigilant is becoming informed.

Watch the following video:

- Respecting Creative Work Video vignette: Henry's Story (3:02 min)

Using the new Copyright Act of Canada Bill-C11, review intellectual property and copyright law for your discussion questions. You may want to research other online resources as well:

- Michael Geist blog
- Canadian Copyright, 7 Key Questions
- Copyright Matters
  Noel, W., & Snel, J. (2012). *Copyright matters!* (1st ed.). [Toronto]: Council of Ministers of Education, Canada ; [Montréal].

Appendix H ~ EDU 210 Spring 2014 Interactive Lecture Resources (with markup)

Resources

Technology continues to invoke a powerful change in the way information and resources are easily accessible online. Teaching and modelling ethical behaviours play key roles in the ongoing promotion, education and expectation of respecting intellectual property and copyright. Within an educational context, copyright and intellectual property is a topic full of complexities. Teaching and modeling ethical behaviours requires teachers to be informed and vigilant. The best way to start being vigilant is becoming informed.

Watch the following video:

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- ~~Read Respecting Creative Work Video vignette: Henry's Story (3:02 min)~~

~~Using~~ the following:

- Nine themes of Digital Citizenship, and think about which themes are related to Intellectual Property, Copyright and Academic Integrity.
- Fair Dealing and Educational Institutions in the ~~new~~ Copyright Act of Canada Bill-C11 ~~Bill-C11~~, and know your rights and responsibilities.
- Academic Integrity at the University of Alberta on its site, handbook or guide, and learn about plagiarism, appropriate collaboration, and avoiding and preventing cheating.

Work through the following Tutorials:

- Learn how to use ~~review intellectual property and copyright law for your discussion questions. You may want to research~~ other people's work ethically, with academic integrity:
  - Tutorial 5.1 What is plagiarism?
  - Tutorial 5.2 Avoiding Plagiarism
  - Tutorial 5.3 What is paraphrasing?
  - Tutorial 5.4 Anatomy of a citation and reference
  - Tutorial 5.5 Citation styles
- Learn to evaluate how and when you can use information appropriate and responsibly:
  - Can I use it? Interactive presentation

Would you like more ~~online~~ resources? ~~as well:~~

- Canadian Copyright, 7 Key Questions
- Copyright Matters
- Creative Commons Licenses
- Michael Geist blog

Appendix I ~ EDU 210 Spring 2014 Interactive Lecture Guest Lecture Class Plan

EDU 210 Introduction to Educational Technology (LEC A1 SP14) ~Class Design (Researcher Notes)

1. **Introduction**
   - Not legal advice
   - Overview of the structure
     - Relevance
     - Copyright
     - Creative Commons

2. **Relevance**
   - Activity: Review results of questionnaire
   - Lecture: teachers and students as creators and users of intellectual property
   - Case examples
     - Anti-oil sands video
     - I can posters
     - Tuxpi.com
     - Thinglink
     - SPiderscribe.net
     - Big huge labs
     - Writing online/ blogging
   - Lecture: Images
     - What is free?
     - Resources
       - Clipart
       - Internet search engines and filters
       - Tineye.com

3. **Copyright**
   - Lecture: Intellectual Property
     - Lecture: Geographic Indicators
     - Lecture: Traditional Knowledge
     - Lecture: Trade Secrets
     - Lecture: Patents
     - Lecture: Trademark
     - Lecture: Copyright
     - Activity: What type of Intellectual Property Cases / Online Poll
   - Lecture: Copyright
     - Lecture: Examples of P2P online file sharing
     - Lecture: Copyright matters resource
     - Lecture: About copyright
       - Lecture: Copyright is
       - Lecture: Enforcement
       - Lecture: Exceptions
     - Lecture: Digital Locks
       - Lecture: Terms of use
     - Activity: YouTube in Education
       - Q&A: Three uses of YouTube in the Classroom
       - Lecture: Terms of Use
       - Lecture: Show vs distribute
       - Lecture: Practical applications
   - Lecture: Can I use it?
     - Lecture: Copyright
     - Lecture: License
     - Lecture: de Minimis
     - Lecture: Fair dealing
       - Lecture: Appropriate purpose
       - Lecture: Six factor test
     - Lecture: Other exceptions
       - Lecture: Copyright modernization act

4. **Creative Commons**
   - Lecture: Types of licenses
     - Lecture: Attribution
     - Lecture: Share-Alike
     - Lecture: Non-commercial
     - Lecture: Non-derivative
   - Activity: Place licenses
   - Lecture: Which CC license is right for me?
     - Lecture: student as producer

5. **Citation**
   - Lecture: Citation resources
     - Citation machine
     - Knight cite
     - Library UofA

6. **Conclusion**
   - Lecture: Motivational quote

Appendix J ~ EDU 210 Spring 2014 Interactive Lecture Guest Lecture Resources

home | Course: EDU 210 INTRO T | EDU 210 Class - Intellectu

www.2learn.ca/workshops/EDU210IPClass.asp

2Learn.ca Presentations

EDU 210 Class - Intellectual Property and Copyright

Highlights of the Session

What does Intellectual Property and Copyright mean? How does this affect teachers? What changes have occurred to the Copyright Act that affect educational use of resources as a result of the passing of Bill C-11? What is Creative Commons and why is it important? These and other questions about Intellectual Property and Copyright will be addressed.

Links for this session are listed below.

Our Portals
- 2Learn.ca
- theconcourse.ca

Our Student Websites
- ABC@2Learn.ca
- Ready 2Learn.ca
- Kids Love 2Learn.ca
- 2Learn.ca for Teens
- Senior High Source

Connecting with 2Learn.ca
- 2Learn.ca Communications
- Vantage
- 2Learn.ca Today
- 2Learn.ca on Twitter
- 2Learn.ca on Facebook

Featured 2Learn.ca Websites
- Your Digital Presence - Copyright: The Basics
- Your Digital Presence - Copyright: Can I Use It?
- Your Digital Presence - Copyright: Digital Locks
- Your Digital Presence - Copyright: Fair Dealing
- Your Digital Presence - Citation
- Your Digital Presence - Open Use Media Collections
- Create 2learn.ca

Creative Commons Sources
- Wikimedia Commons
- Flikr Creative Commons
- Google Advanced Image Search
- Dig ccMixter

Production Websites
- Automotivator
- Tuxpi
- ThingLink
- Spiderscribe - Mind Mapping
- Big Huge Labs [13 yrs + users]
- WikiSpaces

Other Featured Websites
- YouTube - Terms of Service
- Which Creative Commons License is right for me? [pdf]
- Citation Machine
- KnightCite
- Digital Tattoo - Guide to Citing Open Use Images - YouTube video
- Tineye.com

Support Us | Link Problem | Contact Us | Send to a friend

Appendix K ~ EDU 210 Spring 2014 Interactive Lecture Rubric

Rubric for

Online Activity

TOTAL: 5 Marks

	3	2	1	0
Content	Student shows strong evidence of thought relating to the concepts presented. Student shows reflection that goes beyond the scope of the course.	Student shows acceptable evidence of thought relating to the concepts presented. Student shows reflection that is within the scope of the course.	Student shows weak evidence of thought relating to the concepts presented. Student shows reflection that is not strongly tied to the scope of the course.	Student did not post/reply.
Quantity & Timeliness		Student exceeded the required number of posts/replies in a timely manner.	Student met the required number of posts/replies in a timely manner.	Student did not meet the required number of posts/replies in a timely manner.

Online Activities Rubric

Appendix L ~ Digital Story

EDU 210 Intellectual Property & Education Large

1. EDU210 Intellectual Property & Education

1.1 Resources we use

Notes:

There are many situations where we as teachers and students find ourselves wanting to use things that are protected by copyright.

For example:

- using online text and images in a presentation
- showing a movie or playing a song in class
- using a worksheet from a textbook or website
- having our students perform a play

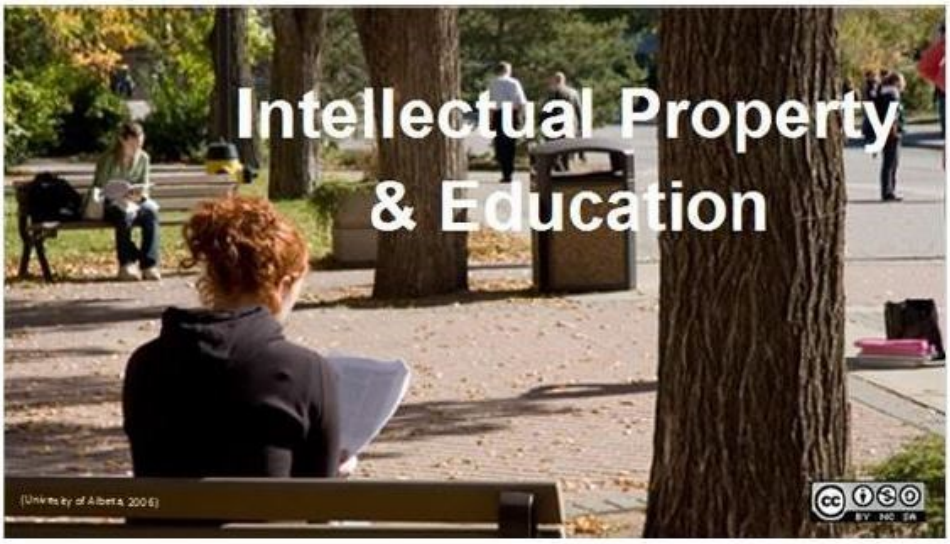
Interactive Lecture: Intellectual Property, Copyright & Academic Integrity

1.2 Can we use them?

Notes:

But we have to ask ourselves whether we actually have permission to use them?

1.3 Intellectual Property & Education



Notes:

Hi, my name is Anwen and I will talk to you today about the rights to use Intellectual Property in Education.

1.4 By the end of this lecture

Notes:

By the end of this digital story, you should be able to

- use other people's work legally in education
- use other people's work ethically in education

2. Use ethically

2.1 Academic Integrity

Academic Integrity

How to use other people's work ethically

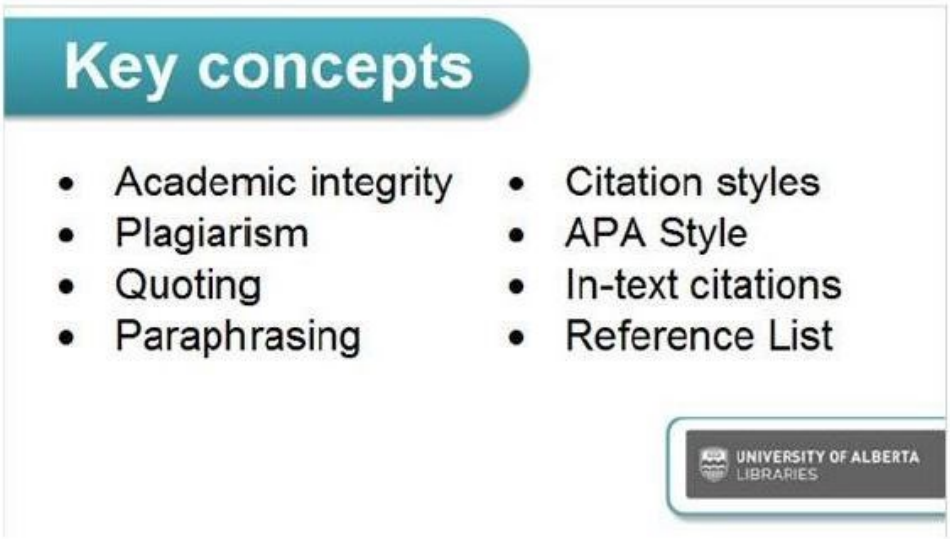
Notes:

The University of Alberta Office of the Registrar states that the UofA is "committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect."(UofA Office of the Registrar, 2014)

Students are urged to avoid any behaviour which could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence (2014).

Academic integrity is important because without stringent standards, "the evaluation process becomes flawed and, ultimately, unreliable, diminishing the value of the degree for everyone" (UofA Office of Student Judicial Affairs, 2014).

2.2 Key concepts



Notes:

These are the key concepts you need make sure you know and understand in order to use other people's work ethically. You can find each one of them in your glossary.

We also recommend that you to study the following University of Alberta Libraries tutorials:

5.1: What is plagiarism?

5.2: Avoiding plagiarism

5.3: What is paraphrasing?

5.4: Anatomy of a citation and reference

5.5: Citation styles

You can click on this image to visit the University of Alberta Citations & academic integrity tutorials. You can also find the link in the Interactive Lecture Resources Tab for this module.

2.3 Recommendation

Notes:

Learning to cite requires care and attention, use all of the resources provided and observe how others cite their sources. Please note how we have cited our sources in this digital story and the other materials in the course.

And, in one sentence: Cite your sources... it's the right thing to do!

3. Use legally

3.1 Academic Integrity

Notes:

Why is Copyright important?

This is what the Council of Ministers of Education Canada, the Canadian School Boards Association, and the Canadian Teachers' Federation (2012) have to say about it:

"Since teachers use copyright-protected materials as well as educate the copyright owners and users of tomorrow, they have a unique responsibility to set the right example. The works of others should not be used without their permission unless the use is permitted by the Copyright Act. Teachers must be cognizant of the copyright status of resource materials in their possession." (p. 7).

3.2 Copyright Law

Notes:

The copyright law of Canada governs the legally enforceable rights to creative and artistic works.

Current copyright law was established by the **Copyright Act of Canada** which was first passed in 1921 and substantially amended in 2012.

(Copyright Law of Canada, 2014)

3.4 Types of licences

Notes:

License types can range from

- Open, which promote a culture of sharing, to
- Proprietary, in which works are protected by exclusive rights.

(Lessig, 2005)

3.5 Copyright

Notes:

Copyright is an example of a proprietary licence. It protects literary, artistic, dramatic and musical works. It also protects computer programs, performer's performances, sound recordings and communication signals.

In general, copyright can be defined as the sole right to produce, reproduce or perform a work or a substantial part of it.

If the work is unpublished, copyright includes the right to publish the work or any substantial part of it.

In other words, the person who holds the copyright to something is the only person who can say how it can be used.

(Canadian Intellectual Property Office, 2014)

Would you like to review a recent copyright infringement case? If so, Click on this button.

3.6 Copyright Owner

(McNary, 2014)

(Bibblart, 2011)

(Shirtwaist, 1938)

(Mark, n.d.)

Notes:

Warner Brothers Entertainment owns the Copyright of original films like Wizard of Oz, Gone with the Wind, and Tom & Jerry Cartoons.

However, the property rights for the films posters had already expired, they were in the public domain.

3.7 Copyright Infringement?

(Mark, n.d.; Maenick, 2011; IsleRain, 2013; Wizard of Oz Lunchbox, n.d.; Wizard of Oz Mug, n.d. a; Wizard of Oz Mug, n.d. b)

Notes:

A company called AVELA commercialized reprints of the posters as well as derivative works on shirts, lunch boxes, mugs, and other collectibles

Warner Brothers sued for copyright infringement

3.8 Copyright Infringement!

Notes:

Warner Bros won and the Court awarded them$2.57 million in damages.

If you would like to read more about this case, click on any of the following links (see buttons).

3.9 Creative Commons (CC)

Notes:

Creative Commons is an example of an open licence. They provide a free and standardized way for copyright holders to give the public permission to share and use their creative works.

Creative Commons licenses let copyright holders change the copyright terms of a work from the default of "all rights reserved" to "some rights reserved." thereby opening up access for others to use the work.

(Creative Commons, 2014a, 2014b)

Creative Commons is part of a larger open information movement. According to the Creative Commons organization: "A public commons, enabled by the open web, is the most powerful force to foster creativity, inspire innovation, and enhance human knowledge around the world." (Merkley, R. as cited in Harmon, 2014).

3.10 CC Licenses

Notes:

All creative commons licenses require that users provide **attribution** to the creator when the material is used and shared. Some licensors choose this as the only condition to reuse the material.

There are five other types of licenses which combine attribution with one or more of three additional levels of permission. They include:

ShareAlike (SA), which requires adaptations of the material be released under the same license.

NoDerivatives (ND), which prohibits the sharing of adaptations of the material; and

NonCommercial (NC), which prohibits commercial use of the material;

(Creative Commons, 2014)

Would you like to know how open-source web 2.0 handles copyright?If so, click on this button.

3.11 Wikipedia

Notes:

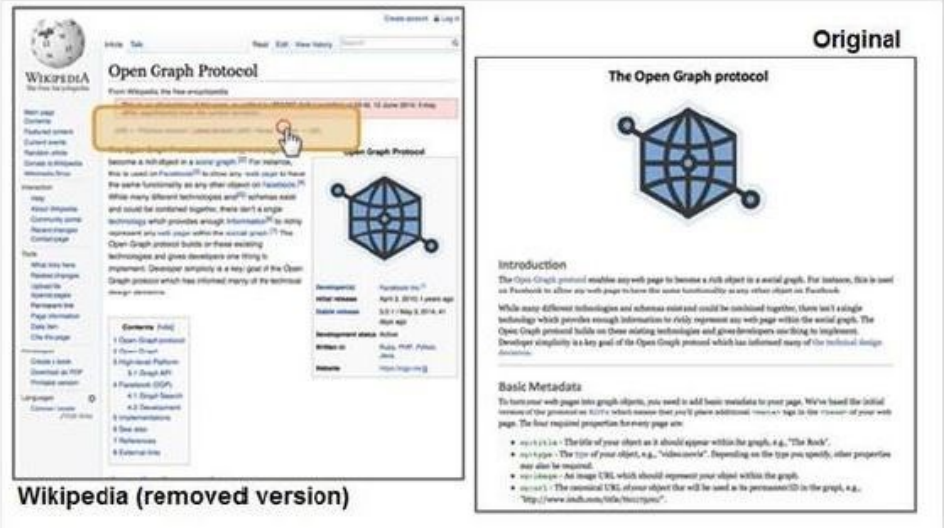
Let's see how a non-for-profit open-source collaborative web 2.0 global initiative handles copyright:

"Wikipedia is free content that anyone can edit, use, modify, and distribute: Since all editors freely license their work to the public, no editor owns an article and any contributions can and will be edited and redistributed. Respect copyright laws, and never plagiarize from sources. Borrowing non-free media is sometimes allowed as fair use, but strive to find free alternatives first." (Wikipedia: Five Pillars, 2014)

Now let's look an example of how this is enforced: User FFA25C edited the article "Open Graph Protocol" at 03:48, 12 June 2014

Wikipedia's duplicator detector marked it for potential copyright issue less than twelve hours later. The duplicated content was put on hold until the content could be investigated.

3.12 Copyright Infringement!



Notes:

We can observe on the left that the content added by User FFA25C is almost an exact copy of the original content on the right.

If you would like to review this case in detail, click on any of the images to visit the original sites.

In Wikipedia, use this navigation menu to see newer or older versions of the article.

If you would like to read more about similar cases visit the Wikipedia: Copyright Problems article in the Interactive Lecture Resources tab for this module.

3.13 Can we use it?

Notes:

So, what do we as teachers need to consider before using a resource in our teaching?

We recommend using 2Learn.ca's "Can I use it?," an online tool which provides an easy six step process to answer this question.

Click on the button to see this tool.

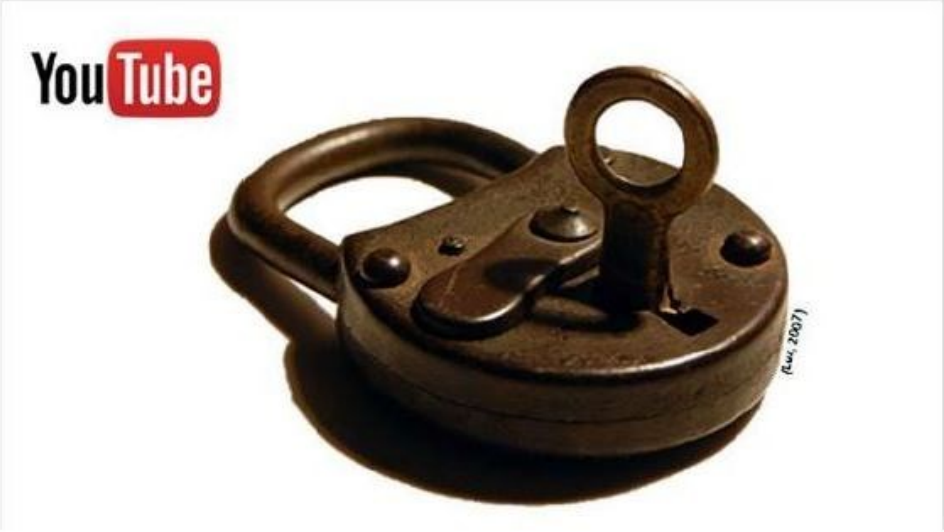
3.14 Exceptions on © law

Notes:

In 2012 changes were made to Canadian Copyright Law. They included a Fair Dealing Exception for education. This loosened copyright constraints for educators significantly, but it is still important to use the "Can I Use it Tool" and do some investigating before you use a work that is not your own.

You can find a link to this section of the new Copyright law in the Interactive Lecture Resources tab for this module. It is called Government of Canada Copyright Law Exceptions.

3.15 Digital Locks



Notes:

Copyright holders sometimes use **digital locks** to restrict the use of or access to their work (Copy Protection, 2014; 2Learn.ca, 2014)

It is illegal to circumvent, break or bypass this protective measures under any circumstances including educational purposes.

For example, YouTube uses a digital lock to prevent people from downloading videos from their site. There are third party pieces of software which allow you to bypass that digital lock and download the content anyway. However, that action is considered copyright infringement and is illegal.

3.16 Ask for permission

Ask for permission

Notes:

If you want to use something and are not sure if you have the right to do so, feel free to contact the copyright holder and ask for permission to use it. Many people will be fine if you are using their work for educational purposes, but it is best to ask and get confirmation.

It protects you from getting in trouble, you might create an opportunity for collaboration and it is just the right thing to do.

3.17 Key concepts

Notes:

Here is a review of the key concepts we have just worked through. Knowing and understanding them will help you use other people's work legally and ethically.

4. Summary

4.1 Summary

Notes:

Throughout this lecture we talked about the rights to use Intellectual Property in Education. We learned that Academic Integrity entails using other people's work legally and ethically.

In order to use other people's work ethically in education we need to cite our sources.

In order to use other people's work legally in education we need to check for a license and terms of use, respect digital locks, deal fairly, and ask for permission.

If you have any questions please refer to your course instructors. If you would like to revisit any part of this lecture you can click on these images or on any title in your Interactive Lecture Menu on the right.

4.2 Reference List

Reference List

Academic Integrity (2014, April 10). In *Wikipedia*. Retrieved from <http://en.wikipedia.org/wiki/Academic_integrity>

American Psychological Association (2014a). APA Style. [Website] Retrieved from <http://www.apastyle.org/>

American Psychological Association (2014b) APA Style Basics of APA Style Tutorial. [Online Tutorial] Retrieved from <http://www.apastyle.org/learn/tutorials/basics-tutorial.aspx>

Canadian Intellectual Property Office (2014, January 31) A guide to Copyright [Online] Retrieved from <http://www.cipo.ic.gc.ca/eic/site/cipointernet-internetopic.nsf/eng/h_wr02281.html>

Citation (2014, June 17). In *Wikipedia*. Retrieved from <http://en.wikipedia.org/wiki/Citation>

Copy Protection. (2014, June 20) In *Wikipedia*. Retrieved from <http://en.wikipedia.org/wiki/Copy_protection>

Copyright Law of Canada (2014, April 13) In *Wikipedia*. Retrieved from <http://en.wikipedia.org/wiki/Copyright_law_of_Canada>

Council of Ministers of Education Canada, Canadian School Boards Association, Canadian Teachers' Federation (2012) *Copyright Matters! Some Key Questions & Answers for Teachers*. [Electronic Resource] Retrieved from <http://cmec.ca/Publications/Lists/Publications/Attachments/291/Copyright_Matters.pdf>

4.3 Reference List

Reference List

Creative Commons (2014, June 24) About the Licenses [Online] Retrieved from <http://creativecommons.org/licenses/>

Creative Commons (2014b, June 30) About [Online]. Retrieved from <http://creativecommons.org/about/>

Creative Commons (2014c, June 30) Education [Online]. Retrieved from <http://creativecommons.org/education>

Fair dealing in Canadian copyright law (2014, January 5) In *Wikipedia*. Retrieved from <http://en.wikipedia.org/wiki/Fair_dealing_in_Canadian_copyright_law>

Harmon, E. (2014, May 14) Creative Commons Names Ryan Merkley as Chief Excecutive Officer [Weblog]. Retrieved from <http://creativecommons.org/weblog/entry/42684>

IQRemix (2013, October 6) University of Alberta [Image] Retrieved from <https://www.flickr.com/photos/iqremix/10293216393/>

Lessig, L. (2005, October 12) CC in Review: Lawrence Lessing on How it All Began [Blog entry] Retrieved from http://creativecommons.org/weblog/entry/5668

License (2014, May 27) In *Wikipedia*. Retrieved from <http://en.wikipedia.org/wiki/License>

Terms of Service (2014, March 28) In *Wikipedia*. Retrieved from <http://en.wikipedia.org/wiki/Terms_of_service>

4.4 Reference List

Reference List

University of Alberta Libraries (2014a, June 23). *Foundational Tutorials*. [Online Hypermedia]. Retrieved from <http://www.library.ualberta.ca/tutorials/>

University of Alberta Libraries (2014b, June 23) Terminology. *Guide to Academic Integrity*. [Online Resource]. Retrieved from <http://guides.library.ualberta.ca/academicintegrity>

University of Alberta Office of Student Judicial Affairs (2014) *Academic Integrity Undergraduate Handbook* [Online resource]. Retrieved from <http://www.osja.ualberta.ca/en.aspx>

University of Alberta Office of Student Judicial Affairs (2014) *Code of Student Behavior* [Online resource].Retrieved from <http://www.osja.ualberta.ca/Students/UndergraduateHandbook/COSB.aspx>

University of Alberta Office of the Registrar (2014) University Regulations and Information for Students. Evaluation Procedures and Grading System. *Calendar 2014-2015*. [Online resource]. Retrieved from <http://www.registrar.ualberta.ca/calendar/Regulations-and-Information/Academic-Regulation/23.4.html>

Wikipedia: Five Pillars (2014, April 5) In *Wikipedia*. Retrieved from <http://en.wikipedia.org/wiki/Wikipedia:Five_pillars>

4.5 Reference List

Images Reference List

AKZOPhoto (2010, September 21) Sheet Music [Digital Image]. Retrieved from <https://flic.kr/p/8D7PKN>

Andy Dean Photography (n.d.) Honesty Road Sign with dramatic clouds and sky. [Digital Image]. Retrieved from <http://www.ugmsalem.org/honesty-in-recovery/>

Bibbiani, W. (2011, July 6) Wizard of Oz Characters [Digital Image]. Retrieved from <http://www.craveonline.com/film/articles/170617-warner-bros-wins-scary-wizard-of-oz-copyright-ruling>

Cohen, J. (2014, March 13) sign here. [Digital Image] Retrieved from <https://flic.kr/p/m2bD5k>

Faul, T. (2013, October 30) Wizard of Oz Costumes [Digital Image]. Retrieved from <https://flic.kr/p/n98Dq7>

Kasimov, A. (2012, April 29) Book icon [Digital Image]. Retrieved from <http://commons.wikimedia.org/wiki/File:Book_icon.png>

Lindsdell, R. (2013, May 14) Parliament of Canada, Wellington ST, Ottawa (491682) [Digital Image] Retrieved from <https://flic.kr/p/fp5P4m>

Luz, C. (2007, June 17). Cadeado - Lock [Digital Image]. Retrieved from <https://flic.kr/p/RDZx6>

Macdonald, S. (2008, July 4) Your Choice. [Digital Image]. Retrieved from <https://flic.kr/p/55WbFW>

Mark (n.d.) Movie Poster Wiz 26 [Digital Image]. Retrieved from <http://copyrightem.com/wp-content/uploads/2011/07/movie-poster-wiz26.jpg>

4.6 Reference List

Images Reference List

McNary, D. (2014, April 2) Wizard of Oz [Digital Image]. Retrieved from <http://variety.com/2014/film/news/warner-bros-wins-2-75-mil-in-wizard-of-oz-gone-with-the-wind-infringement-case-1201151429/>

Milkmen, C. (2008, August 21) UofA Education North Mural [Digital Image]. Retrieved from <https://flic.kr/p/5fdcws>

Palindrome6996 (2006, August 28). Canada [Digital Image]. Retrieved from <https://flic.kr/p/oMsdd>

pe_il_tu (2012, March, 19) Book pile [Digital Image]. Retrieved from <https://flic.kr/p/briNAd>

Rao, A. (n.d) Exit. [Digital Image]. Retrieved from <http://teachbytes.files.wordpress.com/2013/09/exit.gif>

Schreiber, K. (2006, July 22). Lecture hall [Digital Image]. Retrieved from <https://flic.kr/p/m9Aio>

Shirtwaist (1938, December 31) Wizard of Oz Original Poster 1939 [Digital Image]. Retrieved from <http://en.wikipedia.org/wiki/The_Wizard_of_Oz_(1939_film)#mediaviewer/File:WIZARD_OF_OZ_ORIGINAL_POSTER_1939.jpg>

Skydive Lillo (2012, June 25) Formation skydiving [Digital Image]. Retrieved from <https://flic.kr/p/ckobnd>

UAlberta (2013, September 4) Arts Building [Digital Image]. Retrieved from <https://flic.kr/p/fJVu9J>

4.7 Reference List

Images Reference List

University of Alberta, Office of External Relations (2006, January 17) Girl Reading [Digital Image]. Retrieved from <http://photo.creative.ualberta.ca/netpub/server.np?find&catalog=catalog&template=detail.np&field=itemid&op=matches&value=1106&site=stock>

University of Alberta, Office of External Relations (2007, May 18) Dave Kahane's Classroom [Digital Image]. Retrieved from <http://photo.creative.ualberta.ca/netpub/server.np?find&catalog=catalog&template=detail.np&field=itemid&op=matches&value=1561&site=stock>

University of Hawaii West Oahu (2013, February 27) Wizard of Oz-Wicked Reading-11 [Digital Image]. Retrieved from <https://flic.kr/p/dYT5r7>

Warner Brothers Entertainment Inc. (n.d.) WB Entertainment Logo [Digital Image] Retrieved from <http://en.wikipedia.org/wiki/Warner_Bros.#mediaviewer/File:Warner_Bros_logo.svg>

YouTube LLC (n.d.) YouTube Logo [Digital Image]. Retrieved from <https://developers.google.com/youtube/images/YouTube-logo-full_color.png>

Masnick, M. (2011, July 8) Avela T-Shirts [Digital Image]. Retrieved from <https://www.techdirt.com/articles/20110707/13110415001/wizard-oz-court-ruling-suggests-moviemakers-can-reclaim-parts-public-domain-put-it-under-copyright.shtml>

4.8 Reference List

Images Reference List

IsisRain (2013) Wizard of Oz Dome Lunch Box [Digital Image]. Retrieved from <http://www.fanpop.com/clubs/lunch-boxes/images/2355827/title/wizard-oz-dome-lunch-box-photo>

Wizard of Oz Lunchbox (n.d.) In *ForbiddenPlanet.com*. Retrieved from <https://dyn0.media.forbiddenplanet.com/products/1577280_.jpg.square-true_maxheight-285_size-285.jpg>

Wizard of Oz Mug (n.d. -a) In *FanPop.com*. Retrieved from <http://images2.fanpop.com/image/polls/407000/407241_1269813042302_full.jpg>

Wizard of Oz Mug (n.d. -b) In *Mugbug.co.uk*. Retrieved from <http://mugs.mugbug.co.uk/500/hmb.wizard_of_oz.right.jpg>