

ATHABASCA UNIVERSITY

TACIT KNOWING MADE VISIBLE: THE USE AND VALUE OF AN ONLINE  
ARCHIVE

BY

STUART CHARLES BERRY

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## APPROVAL OF DISSERTATION



The future of learning.

### Approval of Dissertation

The undersigned certify that they have read the dissertation entitled

**“Tacit Knowing Made Visible: The Use and Value of an Online Archive”**

Submitted by

**Stuart Berry**

In partial fulfillment of the requirements for the degree of

**Doctor of Education**

The dissertation examination committee certifies that the dissertation  
(and the oral examination) is approved.

#### **Supervisors**

Dr. Terry Anderson  
Athabasca University

#### **Committee members**

Dr. Patrick Fahy  
Athabasca University

Dr. Mary Kennedy  
Athabasca University

Dr. Susan Crichton  
University of British Columbia

March 26, 2014

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1 University Drive, Athabasca, AB, T9S 3A3 Canada  
P: 780.418.7536 | Toll-free (CAN/U.S.) 1.800.561.4650 (7536)  
[fgs@athabascau.ca](mailto:fgs@athabascau.ca) | [fgs.athabascau.ca](http://fgs.athabascau.ca) | [athabascau.ca](http://athabascau.ca)

**DEDICATION**

I would like to dedicate this work to my late mother, Lucy. I know you wanted to be here today but I also know you never left.

## ACKNOWLEDGMENTS

This degree program, my research study and the eventual production of this dissertation document has, at times, felt like a very solitary endeavour yet as I sit and write these final words I know that I would not be here today without the help, support, and continued encouragement of so many people and organizations.

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Athabasca University and the Centre for Distance Education has been a huge support for me, both financially with scholarships and through the encouragement and continued engagement of their faculty and staff right from the start in August of 2008 through to this point: Thank you so much. My employer, Camosun College, has also supported me both financially and with time. My teaching peers have regularly pushed and encouraged me chapter-by-chapter. My Department Chair, Agatha Thalheimer, gave me great latitude in arranging my teaching schedules to fit my learning needs over these past five-plus years. This custom scheduling has been a gift.

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different stages in our academic journey it has been comforting knowing that the bonds developed through our time in this program continue to be strong.

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When I completed my Master's degree ten years ago I hinted to my wife that I might not be finished with my academic journey. I believe she smiled but winced. Health challenges, life changes, and family additions all became enmeshed in our greater world but my wife never stopped encouraging me and knowingly acquiesced to this additional element being added to our lives. For the first time in our married life there were vacations, trips, and conferences for one, and many lonely dinners and challenging social engagements. You share my successes and continue to keep our family together

while allowing me to move on this journey. I cannot thank you enough and I look forward to being together and holding hands more often. As much as we have shared this journey I must share this final product and degree with you.

There is one more needed mention: our dear granddaughter Ariana. I know that you must be very tired of hearing that I need to write or focus elsewhere instead of playing or being with you but I hope that your exposure to my academic world only serves to open your eyes to great possibilities and a wonderful future.

This dissertation is by no means a perfect or definitive piece of work. I take full responsibility for any errors or omission that may appear in this document and I very much look forward to a continued presence in the field of online teaching and learning.

Stuart C Berry – 2014

## ABSTRACT

This dissertation outlines a design-based research study that takes place within two subsequent iterations of an online Masters' course. This study examines the use and value of a learning archive, as perceived by students through their interactions with learning artefacts used during their course. Their course is held within an innovative and experimental social-networked learning environment. This study is based on key elements of organizational knowledge creation theory, in particular the process of knowledge creation and the concept of *ba* being the underlying context within which this knowledge is developed.

This study documents the perceived impact that visible and persistent knowledge artefacts have on the process of learning. This study also shows that as artefacts are accessed and integrated into the overall learning process student engagement and efficacy are perceived to change in a positive way, and these changes impact both the learning environment and the learning process.

This study produces two key outcomes. The first outcome is that the use of a socially networked online learning environment as a virtual classroom can offer a richness and an openness through its capacity to create, annotate, rate, and comment upon persistent artefacts. This use, coupled with permeable and flexible boundaries in the learning environment, offers richness to the learning experience. Learners within a social-networked space, as is used for this study, have complete control over their privacy settings and can make their contributions as open or as closed as desired. This type of environment encourages learning beyond the confines of the classroom and provides support for learner engagement and efficacy.

The second key finding is that students in this study support the inclusion of a dynamic course archive containing artefacts from learners in prior iterations of the course. Given the structural limitations of many online learning environments, this study demonstrates that such an archive is likely best placed with a social-networked learning space and with appropriate search, tagging, and navigation tools. The study demonstrates that students will and have benefited from the archive's use in support of their learning and will contribute to it in support of the learning of others.



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## **Chapter One: STUDY INTRODUCTION**

### **Chapter Overview and Study Introduction**

This document seeks to generate a conversation with its readers about different ways online environments can be used to support learning and knowledge creation. Oakeshott (1989) indicates that the value of a conversation “lies in the relics it leaves behind in the minds of those who participate” (p. 60). However, it is not the fact of the “leaving of relics behind” that I hope to achieve through this conversation, rather it is a belief that relics have a life beyond their creation and relics can often serve as a nexus for new and innovative ideas beyond their original intent. This study deals with a form of relic that I refer to as an online learning artefact, and it is the potential value of these artefacts contained in an online archive that I examine in this study.

My research occurs within the context of post-secondary online education. In its more narrow, question-based focus, this research project examines the value perceived by learners that is generated through their interactions with learning artefacts contained in a social-networked, online learning space.

The theoretical foundation of the project is based upon a business management theory known as organizational knowledge creation theory (OKCT) (Nonaka, 1994; Nonaka & Takeuchi, 1995; Nonaka, Toyama, & Hirata, 2008). My dissertation is founded on this theory in the belief that elements of this business management theory can be appropriately re-imaged to offer an education perspective based on this extensively researched and documented theory and set of business practices. OKCT “seeks to explain the why, when, what, and how of individual and organizational entanglement in creating new knowledge” (von Krogh, Takeuchi, Kase, & Cantón, 2013, p. 3). My



project is not an attempt to match this theory exactly as the theory's authors have previously structured it, but to recognize it as an imaginative approach in support of the creation of knowledge, and to re-examine this theory as an aid in the process of learning and teaching in an online education context. In addition, this research project shows how a bridging of disciplines can offer an innovative view into the process of knowledge creation, and it presents a different perspective on the creating of new and innovative models and theories in support of online learning.

Innovation is a product of the interaction between necessity and chance, order and disorder, continuity and discontinuity. Innovation is the result not only of the planned allocation of resources to meet some predetermined clear objective, but also of some difficult to predict or duplicate redundancy, chance, uncertainty, or even chaos. It is not unusual to discover information and knowledge born of the development process that did not sequentially follow the innovator's original intent. (Nonaka, 1990, p. 27)

This research project opens idea-doors I never imagined existed and challenges me in exciting ways that I trust will become evident throughout this document. I am not sure that naivety and innovation go hand-in-hand, yet it was through my somewhat naïve jumping in and believing in this project in a very passionate way that I have arrived at this stage, the final articulation of a multi-year research project. My study starts with fixed objectives and goals, and despite a concerted effort to keep it within the confines of my original ideas, elements of these original ideas “did not sequentially follow [my] original intent” (p. 27). In retrospect, although the project and the outcomes from the data do not follow in a nice and straightforward path, this challenges me to better understand my assumptions and engage my data in a far more critical way than I may otherwise have

done. Despite this, however, there were times that the “chaos” (p. 27), which is expressed in many forms, gets in the way of my understanding and my ability to appreciate what is occurring throughout this project. In many respects this is a project-within-a-project; it is not just a study as outlined in my original proposal, but it is a day-to-day reflective piece on the process of my personal knowledge creation and learning.

My struggles to understand what was happening in my research environment, with my data, and with my research participants fortunately were mitigated through a key element of my research methodology (educational design research also known as design-based research), in that I am as much a participant in the research as I am a researcher (Lincoln & Guba, 1986). This brings me face-to-face with almost every aspect of my study. This creates an element of trial-by-fire and it helps to push my understanding and my knowledge of the process of knowing. A more detailed discussion of the participant researcher (Nonaka et al., 2008; Wang & Hannafin, 2005) will be provided in Chapter 5, my methodology chapter.

No matter how much necessity, order, and continuity I attempt to bring to the process, I am continually faced with a great degree of chance, disorder, and discontinuity. Despite the “difficult to predict... duplicate redundancy, chance, uncertainty, [and] even chaos” (p. 27), I have developed a better appreciation of the process of knowledge creation, and this helps me to find better ways to understand my research and the results as is discussed in the results chapter. As I now re-examine my understandings of this research project, I reflect on the above quotation (Nonaka, 1990), and ask what if the word knowledge was used as a synonym for innovation? Could the ensuing “chaos” be

seen as an intentional, interactional element in the process of developing new ideas, and from these ideas, develop new knowledge?

“There is always innovation. The trick is sustained innovation, which realizes the full potential of an innovation and overcomes its original defects and limitations” (Bereiter, 2002, p.321). As indicated earlier, this research project attempts to build a conversation, a dialogue on the process of knowing, and it builds upon an understanding of how we can make available and better use our tacit understandings. I mean tacit in a very broad but personal way in this context. In this sense, tacit understanding is a level of understanding that is held within our minds. However, in saying so we can affect and assist others in their process of developing new knowledge while at the same time develop individual thinking and thought processes. Knowledge is formed as a result of the process of knowing and knowing is informed by knowledge (Nonaka & Takeuchi, 1995). This is a description of the SECI model or knowledge creation cycle, which is, described in detail in the literature review chapter. This research is about the process of knowing (Whitehead, 1985) and not the product known as knowledge.

This study examines environmental changes to online learning environments that in many ways mirror processes used in highly structured corporate environments to enhance competitive advantage. I argue that these corporate knowledge creation environments can help to inform and support the learning process in today’s online formal and even informal learning environments and, in the process, potentially offer learners a competitive advantage.

## **Research Study Environment**

This research study takes place within two consecutive iterations of an online Masters' level course held at a fully online Canadian university. As an active researcher and member of the two iterations of the course that is studied in this project, I engage the participants and contribute to a dynamic course archive containing artefacts from current students and students from prior versions of this course. All of this is done while experiencing the struggles and challenges that the environment and the archive pose for the students in the course iterations. I had an opportunity to be a teaching assistant (TA) in a section of the study course one year previous to the start of my study, and this allows me to gain some appreciation of the structure, focus, and demands of the course. The version of the social learning environment in place at the time of my TA involvement was less refined (fewer features and the search tool was very limited) than the version the research participants engaged with. Having had this exposure to the course from a TA perspective helps to orient my thinking with regards to the environment and the existing archive. As a TA, I had a different relationship with both the students and the professor. Although at the time I did not see myself interacting in any different way with the class, I know that my TA role caused me to filter my student interaction in a more assignment-focussed manner. In this earlier role, I interacted with the course content and the learning environment rather than as an active observer and researcher. My active participation in this course environment as both the researcher and an active member allows me to more clearly appreciate the impact and effects of the archive, and be in a better position to understand what can be done to create appropriate design principles for the future.

This social-networked environment within which the learning takes place is a key factor in the way that learners interact with the archive and how it is used throughout their course. More specifically, this learning space is a custom version of an Elgg environment that has been built and designed to support learners within the university community. Elgg (ELGG, n.d.) is an open-source social networking platform and in the case of the university in question, this custom Elgg environment (referred to throughout this document as Custom Elgg) moved from being a generic social space to one where faculty and learners create teaching and learning spaces as well as supportive social learning spaces across disciplines and beyond the confines of the official learning management system (LMS) of the institution. The LMS has not been discarded; however, this custom Elgg social-networked learning space is being used by an increasing number of staff, faculty and students to support their learning across disciplines and to provide a safe social space within which conversations can occur, where faculty and students can create, populate, and nurture their own individual digital learning and social contexts.

The day-to-day discussions and interactions of face-to-face learning environments are generally not captured for future use in any form of a long-term archive used in educational contexts. Learning management systems (LMS), although capable of capturing these types of exchanges, are not intended (or used) as long-term, student content re-use tools. They are intended to host single, isolated sections of courses, which are then closed off upon completion. Anything contained within a course section is kept together with the course upon its completion and stored away as one would do with materials from any face-to-face course section. Subsequently, the LMS course is stripped

of spontaneous and temporal student and teacher contributions and then reopened for a fresh cohort of students. In contrast, the persistent affordances of online learning in a socially networked environment provide the opportunity to examine and revisit conversations, learning struggles, and the learning processes of others and it is this unique aspect of social networked, online learning environments that my study examines.

Technological affordances are rapidly changing the face of learning environments and this study examines a small but important slice of the way we use online learning environments during the period from 2009-2011. This research has been framed within a context of knowledge creation, reflective practice, network and self-efficacy, as well as the emergent use of socially networked learning environments in education.

### **Significance and Rationale for the Study**

Academic research and writing at times benefit from theories and concepts that cross between domains and disciplines to support or enhance a particular point or direction. What takes great effort, however, is the linking of theories or foundational constructs from one domain to another. Organizational knowledge creation theory (OKCT) has had over twenty years of very public examination and practical integration into business management practice and organizational leadership (von Krogh, Takeuchi, Kase, & Cantón, 2013). This literature is infrequently cited or referenced in mainline educational research and theorizing. The potential for linking this theory and its core components into an educational context offers a challenge in that I found few examples of similar work against which I could push my ideas as presented in this research. My review of the literature suggests that little appears to have been written supporting or linking organizational knowledge creation theory to non-business or non-management

areas. However, there is no direct evidence to suggest that those who research and write almost exclusively within the field of business management and knowledge creation believe that organizational knowledge creation theory belongs solely within the purview of business management. There also appears to be little evidence that these theories and their supporting constructs have been utilized beyond these defined walls. The little I could find linking these theories to education are referenced throughout this document.

The significance of this study, therefore, lies in the fact that we can now see concrete evidence of the impact of a theory being bridged across domains. The ability to build a teaching/classroom archive in different forms has always existed. Technologies today afford us the opportunity to extend the use and the reach of these types of learning tools and supports. With an increased use of the Internet, and in particular Web-based applications being used in business, personal, and education environments, we have the ability to integrate new and different uses for these various supporting affordances and theories. Much of this involves repurposing or creatively restructuring models in use in other domains and exploiting the unique features made available by these evolving online environments. My attempt to bring aspects of OKCT into an online teaching and learning environment and use them as a lens to examine the value of the use of an archive containing learning artefacts is primarily meant to open a door and generate further discussion and ideas as to how we might re-imagine learning.

Gleick (2011) discusses the impact of Charles Babbage's 19<sup>th</sup> century *Difference Engine* as an evolutionary step in our understanding of information. He states that the engine "had to be forgotten before it was remembered" (p. 123). He goes on to indicate that the engine:

Rematerialized like buried treasure and inspired a sense of puzzled wonder. With the computer era in full swing, the historian Jenny Uglow felt in Babbage's engines "a different sense of anachronism." Such failed inventions, she wrote, contain "ideas that lie like yellowing blueprints in dark cupboards, to be stumbled on afresh by later generations." (p. 123)

The value of an online archive is not about failed inventions, but it is about ideas that "lie about" waiting to be re-examined and thought through again by future learners. The importance of an online learning archive may not be very apparent to those so close to their studies, such that they may see it as a distraction (as inferred by some students in this study and outlined in the results chapter) or at most the archive ends up being seen as having limited value (again inferred by some students in this study). However, as with Gleick's example above, the truncated thoughts and tangential ruminations of learners from the past may very well offer gems for learning and treasure for those willing to engage that which prior learners left behind unknowingly, or consciously offered up in the hope that future learners might benefit in some way.

John of Salisbury (1955) in 1159 writes about the "respected authority" (p. 165) of Aristotle's words. He suggests that although others could read and know enough of Aristotle's work to teach it, without Aristotle's original words much of the meaning and understanding of the words would be missing. He suggests that, "we should reverence the words of the great authors whose expressions we should not only hold in high esteem, but also should employ with assiduity" (p. 166). He goes on to add:

Our own generation enjoys the legacy bequeathed to it by that which preceded it. We frequently know more, not because we have moved ahead by our own natural ability,



but because we are supported by the [mental] [*sic*] strength of others, and possess riches that we have inherited from our forefathers. [We are like] dwarfs perched on the shoulders of giants.... We see more and farther than our predecessors not because we have keener vision or greater height, but because we are lifted up and borne aloft on their gigantic structure. (John of Salisbury, 1955, p. 167)

Academic learning environments are generally structured to introduce learners to new material based upon a variety of theoretical and practical approaches to teaching and learning. The pre-set curriculum, the focus of the school or the program, the tools and context of delivery and interaction, as well as the pedagogical leanings and past experiences of the teacher generally shape the learning environment. In most cases, however, iterations of a course or program begin from a predefined *zero-point*. That is, in any given course most learners begin the course or program with little or no current course content or skill knowledge beyond any prerequisite courses or skills, or beyond the possibility that a learner may have taken a similar course or even may have repeated this existing course. At the end of the course, learners should have gained some body of knowledge and demonstrated acquisition of content or skill knowledge.

My meaning of a *zero-point* is that putting aside a course revision, change in materials, or a different presentation approach; each subsequent time a course is taught the course starting point is presumably the same. The course has a pre-defined beginning and end based upon a belief about a number of factors regarding the student who takes the course. This idea of the same course each time, along with this *zero-point*, does not mean that the teacher or the content did or did not evolve or change. The teacher may present course material in a different way as a result of any personal evolution.

Regardless of any of these teacher changes, the *box* encompassing most courses is fairly fixed.

Apart from defined prerequisites, most curricula take learners on a unique journey through a course as groups or individuals; thus, each section of a course starts new. It might be argued that the journey is not unique as a result of a perceived single message and common content, yet each learner's journey is unique by the very nature of his or her individual world, what they bring to the experience, and how they learn and experience their learning (Jacobi, 2011). Learners may be able to demonstrate a shared or common understanding of the material in the course but each learner's journey is unique.

What earlier learners did or did not do in previous sections of a course or how learners engaged the materials in previous iterations is almost never a part of subsequent course iterations – except perhaps in tacit knowledge gained by the instructor through their learning through past experience. It is assumed that learners will discover their own paths and acquire the new knowledge or skill offered by this course as they engage this *new* material. There are courses and programs where starting at a predefined *zero-point* may be a key structural part of the course; however, this *zero-point* start appears to be the norm for most courses, and any use of past learning artefacts on the part of prior learners does not appear to be a part of most learning environments – and indeed could be considered *cheating* or short-changing the student in some contexts.

The use of an archive is a unique innovation in this course at this time and at this university. However, the idea of persistence and artefact use (in a wide variety of commercial and institutional social spaces) has and is being explored elsewhere as well. For example, the University of British Columbia (UBC), Master of Educational

Technology (MET) program has a number of the courses in this program that are offered within different socially-networked learning spaces such as wiki's, blogs, and other social-mediated environments, and student contributions from subsequent course iterations are maintained as part of the evolution of the course. There are some courses in the MET program where a *zero-point* start is a deliberate element in the course design (Jeff Miller, personal interview, April 8, 2011) while in others there is an archive of prior student contributions.

As learners struggle to make sense of material presented in a course and as they engage the course content, they create new knowledge for themselves (both tacit and explicit knowledge). This is done through the development and organization of cognitive structures, the creation of new or altering of existing mental structures, and the subsequent framing of both new and existing models to assist in their individual and in some cases collective understandings (Holton & Clarke, 2006; Vygotsky, 1978). This may be done in isolation by reading, completing exercises, and/or writing papers, yet much of the knowledge development comes from varying forms of engagement, interaction, collaboration, and the asking of questions and verbally challenging our ideas by speaking with others or in accessible text formats. This struggling out loud process is both an internal and an external process. It helps us as individuals to sort through and resolve contradictions and challenges to inconsistent perspectives. Individually we come to these new understandings and the result is new knowledge (Nonaka, 1994; Nonaka & Takeuchi, 1995, Polanyi, 1974).

Subsequent to the creation of new knowledge, we often discard the means by which this knowledge was developed (Holton & Clarke, 2006). This discarding process

is not necessarily a conscious act. Much of the time we do not consciously know or understand what we did or heard (Polanyi, 1974) that allows us to create this knowledge, but ultimately we appear to seek and value the end product and not the process. In this knowledge creation process, it would appear that we decontextualize the thought from its own production. The tacit processes decouple from the resulting explicit product. We are unable to *see* the tacit elements used to create our understanding, our subsidiary awareness (Polanyi, 1974), and the process scaffolds or mental construction forms disappear. We cultivate the product while the idea process lays fallow. This does not imply that tacit knowledge is visible in the more commonly understood sense of visibility; however, this research study attempts to look for evidence of tacit knowledge within the artefacts of learners through the process of their engagement with fellow learners, their teachers, and course content. Today's educationally focussed technological affordances along with elements of OKCT offer us a unique opportunity to reframe the way we build and use learning environments

### **Limitations**

There are pedagogical and potentially privacy issues related to the use of an archive in credit courses. These are not discussed in any detail in this study. The pedagogical activities used in the course were designed to benefit from learner perusal of artefacts of previous sections. Students are informed that their contributions could be made available to subsequent students (if they chose to share these). But importantly, the archive was not accessible on the open *Net* nor to students not registered currently or previously in the particular Masters' degree course being examined.

My study investigates the use, value and related challenges of learner engagement with artefacts left behind by previous learners as these current learners seek to understand and work to create new knowledge. This process is framed within the context of an online academic setting. The study examines what learners value and how they engage with and use formative learning artefacts. The research takes place within a socially networked learning environment. The impact of this learning environment is also examined within the context of the use and value of the archive.

Although this study examines the concept of knowledge creation in an academic setting and it uses a business management theory of knowledge creation as its foundation, the study does not delve into issues of knowledge management as these issues were outside the scope of the project. The study examines student perceptions and attitudes captured in interviews and from online discussions. It examines the use and perceived value of the archive. Perceived attitudes toward the authors of the archive content may have played a role in student engagement with the archive but this was not studied.

### **Dissertation Presentation Model**

My dissertation is presented in the following manner. The first chapter of this dissertation outlines the research study environment, the significance and rationale for the study, along with the limitations of this research. This current chapter introduces the nature of the process of knowledge creation seen through the lens of a business and management context as well as how this business-focussed knowledge creation model might be modified and possibly mirrored in an educational context.

This second chapter provides a historical structural basis for the study. It narrows down the focus and outlines the aims and the nature of the study. The study problem is

placed in context and begins to align the theoretical background to the significance of the problem. Educational design research encourages the researcher to introduce literature as and where needed throughout the written document, as well as within a defined literature review chapter. Elements of the literature are introduced throughout this study to assist in outlining the importance and the context of the study. Although certain aspects of the literature may appear later on, they are brought back as the context and focus shifts and are used to help reframe the conversation (Herrington, J., McKenney, S., Reeves, T., & Oliver, R., 2007).

Knowledge creation is presented within a framework of twenty years of research into organizational knowledge creation (von Krogh, Nonaka, & Rechsteiner, 2012). It includes an outline of the process of knowledge, knowledge creation, the integration of tacit and explicit knowledge, as well as contextual framework known as *ba* (Nonaka & Konno, 1998). This literature links the focus of a design-based study to this study in particular. The end of this second chapter briefly draws together the significance of the historical context and the related research. This second chapter leads specifically to a chapter that focuses on the research questions. These research questions are distilled from the problem statement. There is a discussion pertaining to the various additional questions and conversations that surface throughout the study, as well as their impact on the direction of the study.

This *research questions* chapter, Chapter 3, attempts to better frame the discussion and helps to place the overall conversation in context. A chapter devoted to research questions is not uncommon and considered a viable element in a doctoral

design-based study (Herrington et al., 2007). In an educational research design study the questions tie directly to the development of theory, as discussed in Chapter 3.

Following this third chapter, the literature review chapter examines six key areas or domains of study: knowledge creation; the Japanese concept known as *ba*; tacit knowledge; reflective practice; online social-networked learning environments; and finally, the concept of personal or self-efficacy. The final two domains are additions beyond what was originally proposed for this study. As the study progressed and changes were made, it became clear just how vital a socially networked learning space was to the study. As a result, this topic was added to support the direction of the study. Additionally a review of the concept and value of self-efficacy was added after the data had been analysed and coded, as it also became clear how much the use of an archive within a socially networked learning space contributed to student efficacy. These literature domains speak to the core of this research and provide a foundation for the study. In a design-based study, the nature of iterations helps bring to light new, and possibly different, areas that can assist in understanding the nature of the problem, the possible directions of the study, and in the end, broadens our understanding of what can be done to offer real world solutions to day-to-day academic challenges. As indicated earlier, although an examination of the literature occurs formally in Chapter 4, aspects of it will also appear throughout other chapters, in keeping with the flow of a design-based study.

The fifth chapter, research methodology following the literature review chapter, provides an overview and structure of the research paradigm, the design, and the methodology. This methodology component provides a description of the rationale for

the design-based intervention grounded upon the various paradigmatic views, an outline of the implementation of the intervention in both the first and the second iteration, followed by a description of the design principles for the study.

Following this methodology chapter is the results section, Chapter 6. In this results chapter I outline the outcomes of my study and provide a synopsis of the various themes and threads that were coded and surfaced from my data. My final chapter, Chapter 7, is a discussion, conclusion, and an examination of implications for both practice and further research that have surfaced as a result of this work. This final chapter also includes a discussion about the various design principles that have been developed as a result of this study, including examples in support of these principles. I have added a glossary of relevant terms, which follows the various appendices at the end of this document.

### **Chapter Summary**

Chapter 1 sets the stage for my study and provides a frame for the reader. The problem and rationale for this study as well as the scope are outlined. This includes areas that my study does not attempt to address and that lie outside the scope of this project. In so doing, I have provided an introductory context in this overview.

Language use has been a challenge throughout my research and as such I have provided contextual explanations as well as definitions for some of the terms that are used and reused throughout this document. Finally, I provide a presentation overview of the flow of this document outlining the remaining chapters. In the following chapter, Chapter 2, I provide a more broad-based view of the philosophical underpinnings of my study.



## **Chapter Two: PHILOSOPHICAL AND RESEARCH FRAMEWORK OF THE STUDY**

### **Chapter Overview**

This philosophical framework chapter outlines the building of a relationship between a set of business management concepts and theories and the potential reimagining of aspects of social networked online learning environments. This chapter helps to frame elements of organizational knowledge creation theory (OKCT) within my research context and demonstrate how aspects of OKCT can support learning and knowledge creation as discussed in this study. OKCT posits that knowledge creation is supported by environmental factors that are consciously crafted into an environment. I argue that, in a similar way, student learning and knowledge creation in a socially networked online learning environment can also be enhanced through access, use, and engagement of learning artefacts. Through this process, evidence of tacit understandings may also be made visible thus offering value to current and future learners.

### **Bridging Domains**

OKCT makes no claim with regard to technologies and their use in the workplace. OKCT is primarily a theory of social interaction. This theory focuses on the inter-relationships of individuals and the various social exchanges that occur in the creation of knowledge. My study attempts to examine how aspects of this theory might be used in an education context. It is in this education context where technologies become a key affordance for the possible integration of aspects of this theory.

OKCT has been tested and supported in many different business environments and models have been built putting the elements of this theory into practice (Nonaka,

Toyama & Hirata, 2008). My study tests the incorporation of a dynamic learning archive in a socially networked learning environment, and examines the impact of its use in support of learning and knowledge creation. From the education side, there has been limited use of Nonaka's work to support educational research (Iverson, 2011; Thomassen & Rive, 2010; Wise & Duffy, 2008) as it relates to knowledge creation, as well as Polanyi's (1967, 1974) understandings of tacit and explicit knowledge (Bulterman-Bos, 2008a, 2008b; Wiliam, 2008; McFadyen & Cannella, 2005). Knowledge creation appears to be used to support specific education-related arguments, while others (Na Ubon & Kimble, 2002), hoping to find these connections, continue to struggle to see value due to perceived limitations of current technologies. The connecting of these concepts needs to be pushed further and thus one of the aims of this study is to build a design model that can be supported, in part, by these theories.

What was not considered during the early development of the study was what impact the physical structure of the learning environment would have upon the process of student engagement with the archive, and how knowledge creation might be affected through this engagement? It is one thing to examine and understand a theory or elements of this theory within the context of the world within which the original theory was built, but to attempt to use this theory and its associated elements within an environment whose uses are still being developed and tested is something very different.

Exciting and challenging aspects of this study are the many unknowns associated with the use of a socially networked learning environment, although the relative newness of the use of this type of virtual social space for formal learning may produce trepidation. Another unknown is the way by which learners can and/or will use this environment to

their advantage, including whether and how they use the archive. Use of a social environment such as a virtual classroom provides a unique research opportunity to begin to examine and possibly find learning activities and pedagogies that exploit the features of this learning context.

This study begins with the idea of adding a dynamic or ever-evolving learning archive to an online learning environment, but to do this within a new and relatively untested social learning environment added a further level of complexity to the study. To further examine this model using a theoretical construct built, designed, and tested in a very non-Western business management context, using a non-Western knowledge creation paradigm, could only open the door to an exciting opportunity for new knowledge and new theories of learning. This study offers a way for educators to examine aspects of social networking environments being used in new and challenging ways.

### ***Bridging Academic Domains***

Not only can this study offer an opportunity to enrich and connect multiple worlds across domains but also the design-based model, as employed in this study, is ideally suited for a cross-domain study (Bereiter, 2002). The goal of this study is to strengthen the process of learning and knowledge creation within online learning environments, through the incorporation and use of an online learning archive, and potentially introduce a new dimension to the process.

Bereiter outlines his understanding of the purpose of design-based research.

Although there is innovation in education it tends to be sporadic and discontinuous, with the result that innovative practices seldom win out against those with

a long evolutionary history. Factors contributing to this condition include the difficulty of envisioning the human consequences of innovations and the predominance of research models that do not contribute to innovation. Design research is an emerging effort to bring what Whitehead called “disciplined progress” into education, but it has not yet taken on a clear form or purpose. Design research is not defined by its methods but by the goals of those who pursue it. (p. 321)

This design-based study pushes the bounds of innovation across academic domains and links the concepts of organizational knowledge creation to online education. OKCT has all of the elements required to support an educational context as examined in this research study, and these supports are outlined throughout the study. This study is significant in that a model allowing for the connection of these seemingly disparate domains is proposed, along with the belief that we can continue with this dialogue. In doing so, this dialogue elicited in me the following general questions to consider in exploring the connection between domains. They provided me with an initial framework for my thinking.

If we were able to offer students a connection to the scaffolding process, could this be of sufficient value to future learners such that these connections could be threaded into subsequent iterations of courses as useful learning aides? Are these artefacts of value to future learners? If there is value, then are there learning activities that a teacher could orchestrate that would assist and promote first the creation and then the use of these archival scaffolds to enhance learning efficacy or efficiency? Do learners appreciate these activities or the artefacts themselves as useful aids in their knowledge building? If we could observe the process of knowing and the development of individual understandings,

or at least see some evidence of this process, if we could then capture these tacit understandings, the *A-ha* moments of learning and of creating new knowledge, and then make them available in some meaningful manner to learners, would we be able to positively and sufficiently alter the learning paradigm to create dynamic learning spaces? In this sense, I am referring to distinct learning spaces and not content spaces. This study attempts to explore these and other questions, to refine them into a set of focused research questions, and to eventually provide a process model for online learning.

### ***Bridging Learning Environment Domains***

The online environment is potentially capable of integrating previously discarded learning scaffolds into the learning process and thus helps to bring the process of knowing to the forefront of the learning paradigm. In a very broad way, this statement can be supported. There are online structures that restrict access or by their very nature erect barriers to the rich sharing and future use of online discussions, conversations, and related documents.

As outlined earlier, LMS environments are examples of these restricted, walled online learning spaces. Social-networked online learning spaces, on the other hand, such as Wikis, blogs, or aggregated collections of social learning spaces and tools such as Elgg, (ELGG, n.p.), offer environments with user-controlled, permeable boundaries where individuals can gather, search, and share resources and hyperlinks, and where permanence and persistence play a key role. Although it can be argued that the LMS world also offers a form of permanence, this is only permanent insofar as an institution may choose to retain the resource. Access to these LMS resources normally ceases after the course ends, and is neither shareable nor accessible after the fact. Neither previous

group members nor new students can add new content or comment after the fact.

Socially networked learning spaces, on the other hand, generally allow users the right to keep or share their resources and thus the process of knowing and its outcomes can have a life beyond any given course.

A possible model by which the above could be examined lies in the integration and use of *Web 2.0* technologies and social software tools in the online classroom.<sup>1</sup> In doing so, it would be necessary to deliberately structure an environment whereby the teacher integrates *Web 2.0*<sup>2</sup> tools such as blogs, wikis, or even the use of a simple micro blogging tool such as *Twitter* for learners to talk out their learning and engage others as they struggled to develop new knowledge. This could also include recordings of past synchronous sessions. Technologies for recording conversations and potentially capturing the learning process are evolving at a pace such that what might appear unthinkable today might be acceptable and in use a year from now. In this respect we need to be open to shifts in thinking about what is needed to support learning and recognize that, for example, the very use of socially networked environments can and are being effectively used in support of formal learning (Veletsianos & Navarrete, 2012).

The teacher could continue to engage and animate current discussions as and where needed, but ultimately socially networked online learning environments could become learner process beds; incubators where idea forms or scaffolds are shared and interpreted as the learning process evolves. Learners could engage and/or re-engage

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<sup>1</sup> It is understood that information and communication technology (ITC) is constantly changing and evolving and that the technologies and tools mentioned in this paper may be different from the start to the finish of this project and beyond.

<sup>2</sup> The term *Web 2.0* generally infers an interactive, multi-way electronic platform (the Web) accessible through the Internet (O'Reilly, 2009).

these learning environments as they seek means to interpret and develop new ideas. The ultimate intent would be that at the end of the course the shared resources of the current course would be incorporated into the next and subsequent iterations of the course in such a manner as to allow subsequent groups of learners the opportunity to share in the learning process resource as learners grew to build their own understandings and new knowledge. Learners could add to the resource by their own ruminations, understandings, resources, and scaffolds, and these same learners could take from the resource in the form of integrating their shared understandings into their own knowledge base. A common example of this iterative growth outside of formal education is Wikipedia, in which articles are constantly evolving in response to edits from past, current, and future editors.

To be effective, this process forum ideally should be semantically and temporally searchable, and be structured to allow for easy, multidimensional access, use, edit, and movement. In this way learners should be able to come at the resource from different perspectives. As well, they should be able to take away what is needed or wanted in the course of their learning and knowledge creation. The idea of multidimensionality in this respect acknowledges the permeable and amorphous boundaries of the social-networked learning environment. Multidimensionality is meant to infer these characteristics as attributes in support of such a model. In this context, the concept of multidimensionality refers to the many different ways that one can engage the archive. Some may come at it directly by searching and possibly finding something specific while others might be exposed to it indirectly through peer referencing and subsequent conversations. Multidimensional accessibility addresses both the needs of different learning

characteristics as well as how learners may approach online learning environments. This includes aspects of course design whereby learning paths may be more directed based upon the focus or intent of the learning outcomes. I should note, however, that this openness and permanence changes the privacy and confidentiality normally associated with closed educational classes or online groups. Privacy issues will be discussed at a later point in this document as these issues pertain to the study environment and the control end-users have over their use and access of learning resources.

The searchable online archive of student engagement in their course would, in some ways, mirror elements of the *Educational Semantic Web* as outlined by Anderson and Whitelock (2004). The authors introduce three fundamental affordances of the educational semantic web, and these affordances speak to the potential value of using archived material in the learning process.

The first is the capacity for effective information storage and retrieval. The second is the capacity for nonhuman autonomous agents to augment the learning and information retrieval and processing power of human beings. The third affordance is the capacity of the Internet to support, extend and expand communications capabilities of humans in multiple formats across the bounds of time and space. (pp. 3-4)

Throughout this research project, elements of business and management process as well as the processes of learning, specifically within online learning environments, have been intertwined and transposed from the world of business and management to the world of online learning environments. Through a variety of questions intended to push the bounds of two seemingly disparate worlds, a bridge of possibilities is built that can



allow for seasoned theory in one discipline to be creatively used in another, and along the way the end result may offer new opportunities for the process of learning and knowledge creation.

### **Study Context**

My research environment is part of an online Masters' level course dealing with business and development issues related to the management of e-learning environments. Within this environment, I examine the use and perceived value of past and concurrent archived online content. This interaction with archived class discussions and copies of student assignments (my design-based intervention) is well suited to online learning, in particular due to the fact that technologies today allow us to capture and revisit interactions of participants in these settings through the use of tools such as asynchronous blogs and discussion forums, tagged and annotated uploaded files, and logged synchronous discussions. Normally, learning environments ([LMSs] such as *Moodle*, *D2L*, or *Blackboard*) are not places where we capture and store the day-to-day engagement of learners for subsequent reuse. Although it is possible for a record of these archives to persist and be made available to students as an archive of their course work, normal practice is to delete or at least make hidden these interactions at the end of the class term. These archives (if created) are not made accessible to subsequent students – partially for privacy reasons, but mainly because, like the face-to-face classroom context, there is a shared assumption of transience. We have the technology to maintain these transactions as an archive. These captured exchanges and articulated acts of learning, unless purposefully retained, for example as samples to amplify a lesson, are believed to have limited value outside of the existing lesson.

Through my examination of the literature I found no examples of studies examining the capture and retention of the day-to-day interactions of students in online environments for teaching and learning purposes, though such examples may have been captured and analysed for research purposes. There are examples of online and face-to-face courses where students use social-networked learning environments. As indicated earlier, students in the MET program at UBC use a variety of social-networked learning spaces for their classes, and these conversations are retained and made available for subsequent learners (Jeff Miller, personal interview, April 8, 2011). At this point in the writing of my study, there appears to be no formal research focussed explicitly on the use and value of these persistent forms of learning environments. Researchers from the UBC MET program have examined their particular use of technology-supported learning environments (Gaskell & Miller, 2006). None of their work addresses issues pertaining to the capture and retention of student work, despite a mention in one of their presentations pertaining to an “enduring legacy... of archived student work” (Boskic, Dobson, Gaskell, Khan, & Miller, 2007, slide 26). Thus my study makes a novel and integral contribution to the extant educational research literature.

The concept of artefacts contained within an archive in an online learning environment may need further explanation. Currently, the mainstay of most online learning environments is the asynchronous, text format, discussion forum (Garrison, Anderson & Archer, 2000). The posts that create these forums are usually in the form of threaded discussions. These posts contain day-to-day conversations, and may contain evidence of student thinking and processes by which students challenge themselves and others as they work through problems, share resources, and articulate potential solutions.

In addition to text discussion posts in their various forms, there may also be individual or group blog posts, wiki entries, voice or video annotations (podcasts), bookmarks, and comments on bookmarks, as well as documents placed online such as completed assignments or other softcopy items contributed and offered in support of learning by instructor or students. There can be recordings of synchronous meetings or links and URLs to other items pertinent to the learning and/or topics being discussed. Most of these resources are generated as the course progresses. Importantly, these items may be annotated, commented upon, liked, favoured, tagged, or sorted by users.

Context and meaning exist within the body of all personal course content added over the time any group gets together. Like an *in-joke*, the context and meaning affixed to any of this personal content may, over time be altered, misunderstood, or misrepresented. In this study, there were times when students commented on certain archived content and expressed a lack of understanding about meaning and intent. Without access to the original context or the author this may create a challenge, yet it should also allow the current student an opportunity to push their understanding of the content in relation to the evolution of the course and to push their meaning of what is read or viewed. Even when students believed they understood the context and intent of archived content they may still misunderstand the original meaning.

The context of this study is about offering learners an opportunity to observe and benefit from the learning processes of others engaged in similar activities. I do not assume that by reading or listening to past contributions anyone would necessarily be able to intuit the exact meaning of what was recorded. Students can post queries to the posts of past contributors even if the original post author is no longer part of the class, in

the hope that current students and/or the teacher might join in on this new conversation and expand upon the thoughts and ideas posted by students from the past. Scaffolds from the past are being reused.

These items or artefacts are contained within an archive. In a broad sense, and as defined, the archive is the place where all of these items are stored, including those from current courses as well as those from earlier sections of a course. The physical structure of this repository, that I have chosen to call an archive, is only an archive because it contains items from a previous time period, not because it is physically separate and called *the archive*. If, for example, the new section of the course ran from January through April of Year 3 then any content earlier than January of Year 3 would be defined as being part of the archive.

The term *artefact* is used and defined to be any given object in the archive. The word *archive*, as with the word *artefact*, at times caused hesitation and prompted questions from students about what was meant by these terms. I did not study nor did I ask why these terms were not well understood. In most instances I explained my meaning based upon the context of the question or challenge. There is a student suggestion during this study asking that all prior content be singly located in a physical place entitled *archive* in the belief that by having these items defined within one location it would have been easier to find needed or wanted content. I explained the structure of the archive, as described above, but I also realized, as will be discussed in the final chapter, just how important the structure of the learning environment is to making an archive useful and meaningful for students. In the case of the socially-networked learning environment within which this study took place, artefacts pertinent to the study

course were located in a great variety of places and it would be very difficult, given the structure of the environment, to have these artefacts relocated into a single location. The content may suffer from the removal of the immediate context into which it was posted.

### **Research Framework**

I choose a design-based research methodology for this research project, as this best suits how I wish to conduct my research and what I hope will be achieved. Although this methodology suggests a pragmatic approach to my research, this project comes together with aspects of an interpretative or constructivist research paradigm (Guba & Lincoln, 2005). Design research aims to produce environmental change while developing practical theories that work in the real world (Barab & Squire, 2004). In addition, the researcher's role in design-based research is as both the designer as well as the researcher taking on an active role as a member in the project (Wang & Hannifan, 2005). My research seeks to develop usable design principles through the construction, inclusion, and use of an archive in online learning environments

In my original research proposal I use the term *design-based research* (DBR) to describe my methodology, as this was the most established name for this methodology at the time I began my study. The term *educational design research* (EDR) is an umbrella term now used to designate a “family of approaches that strive toward the dual goals of developing theoretical understanding that can be of use to others while also designing and implementing interventions to address problems in practice” (McKenney & Reeves, 2012, pp. 17-19). McKenney and Reeves indicate two main reasons for using EDR. The first is to bring the word education into the term itself, and secondly it is felt that there are other research approaches using similar language terms to DBR, thus creating

unnecessary confusion. The term design-based research (DBR) will, at times be used when I am quoting or referencing sources that use this term and where the older term *design-based research* is most applicable.

*Design-based research* (DBR) is defined as follows:

A methodology designed by and for educators that seeks to increase the impact, transfer, and translation of education research into improved practice. In addition, it stresses the need for theory building and the development of design principles that guide, inform, and improve both practice and research in educational contexts. (Anderson & Shattuck, 2012, p. 16)

Design based research was proposed as a way of attempting to better understand the challenges of the real and, at times, chaotic world of educational practice. The very nature of this model encourages “flexible design revision, multiple dependent variables, and capturing social interaction” (Barab & Squire, 2004, p. 3). The object is to study the impact of environments where the researcher has incrementally changed or altered aspects of these environments, and to construct principles that “underpin their impact” (van den Akker, Gravemeijer, McKenney, & Nieveen, 2006, p. 4). Additionally, the object is to connect real world problems with educational research (Amiel & Reeves, 2008). Design and research are not seen as separate entities, as they are intended to work together with the key goal of “[generating] refined design principles and theories” (Oh and Reeves, 2010, p. 264).

This design-based research model also allows for an iterative process such that changes can be made to the research environment if and when evidence indicates that changes are appropriate. As the reader will see, the learning context changes from

iteration to iteration, both due to an evolution in the student-teacher-researcher-learning environment relationship and incremental improvements in the social-networked software platform that supports the course. The dynamic nature of this model is ideally suited for the interactive aspects of this research and, particularly, the “messiness of real-world practice” (Barab & Squire, 2004, p. 3) should allow for a more realistic view of knowledge creation through interactions with recurrent archived online discussions.

This dissertation, with its various chapter headings and sections, is structured and formatted based upon a design-based model proposed by Herrington, McKenney, Reeves and Oliver, (2007). Herrington et al., (2007) argue that the “lack of impact of educational research” (p. 2) has, for too long, produced limited results in the discipline. One of the reasons they cite is that education doctoral students are being poorly prepared to do educational research. They support this, in part, with the work of Shulman, Golde, Bueschel, and Garabedian (2006), in which these authors examine the difference between PhD programs in education and education doctorates (EdD), and conclude that the distinction between these two degrees is significantly blurred such that it has led to a watering down of both degrees, particularly in the area of teaching future academics how to develop effective research. Herrington et al., (2007) acknowledge, “design-based research integrates the development of solutions to practical problems in learning environments with the identification of reusable design principles” (p. 10). They also acknowledge the time involved to effectively manage this form of research. In an attempt to encourage more design-based research in the education profession, they propose a model that permits doctoral students to complete a design-based study within the limited time frame of most doctoral programs.

The model Herrington et al., (2007) build for this type of doctoral research includes a structure that tightens the research time frame to four years, yet still allows for “a great deal of scope to provide a clear and convincing case that the research will be conducted with rigor and responsibility, and it helps design-researchers to clarify their role” (Herrington, et al., 2007, p. 8). The four-year time frame begins with acceptance of the research proposal and allows for up to three iterations of a study. In my case, there were two design iterations, which spanned an 8-month period, and the complete process took approximately four and a half years.

A key reason a design-based model was chosen for this study was that it permits me to become actively involved in my research and not be an external observer of the education context and events from a distance. It also allows me to directly interact with and experience my research environment, along with the various participants, in such a way that I can be a part of their world and attempt, as best as possible, to see the research environment from their perspective. Within this model, I am as much a research participant as I am the researcher. My experience, foreknowledge, and understanding of the intent of the project gave me a very different participant-view. I am, at times challenged by having to wear multiple hats throughout this project. The very nature of the tacit experience is that it is a human activity that must be lived and not just observed. All of the elements of this study (theoretical and practical) are threaded throughout in such a way that the base theory underlying this project, organizational knowledge creation theory (OKCT) and its distinct elements, become part of the process.



## **Chapter Summary**

This chapter outlines a philosophical framework in support of this research study. It outlines the bridging of different academic and learning environment domains as well as the framing of the context of the study within these bridged elements. This chapter seeks to help the reader connect a seemingly disparate set of concepts into a cohesive argument and set the stage for the following chapters.

## **Chapter Three: RESEARCH QUESTIONS**

### **Chapter Overview**

This chapter outlines the questions that guide this study and provides a context for additional questions that frame the daily interactions of the study participants. Cohen, Manion, and Morrison (2008) outline a framework for the planning of research and examine the nature of research questions. These authors discuss how research questions determine the focus and duration of the research, and how there is a strategic nature to the wording of one's questions, depending upon the goal of the research. For example, some questions could lead to and demand lengthy data gathering, resulting in great cost in time and money. Cohen et al., (2008) also talk about the process of operationalizing the research questions. The researcher needs to ask if the questions are measurable and, even more profoundly, if they are answerable.

A design-based qualitative research study is, in some ways, a moving target. The research questions need to begin to address the design, construction, and measurement of an intervention. As the study moves forward and the results lead to iterative changes in the research environment, then these questions can and often should be modified to account for this changed environment. Questions need to address possible alternatives to the originally planned learning environment, how these changes might be put in place, and ultimately how these changes can be sustained (Herrington, et al., 2007).

### **Core Study Questions**

The initial three questions informing this research focus on the use, the value and perceived barriers of an online archive. These three questions are listed here as outlined for the research participants in their original unedited language:

- In an online distance education setting, how can the process of knowledge creation be orchestrated and supported by the use of student and teacher created digital archives including archived discussions, blog postings, shared bookmarks, wiki pages, asynchronous and logged synchronous discussions?
- What perceived value do these archives offer current learners; what impact do these online archives have upon learner's perceptions of their levels of persistence, motivation, and reflective practice; and what other effects surface as a result of having past and concurrent archived material embedded in the curriculum?
- Are there perceived barriers to the use of these archives? If such barriers exist, are these barriers seen to be as a result of the use and/or accessibility of the archives, the nature or dynamic of the current course, issues of privacy and control, or other inhibiting factors?

In short, I want to understand if and how learners in a natural education context use an archive, if they see value in its use, are there barriers in the use of the archive, and what kinds of barriers might exist. "The primary practical contribution of educational design research is the intervention developed to solve a real problem in practice" (McKenney & Reeves, 2012, p. 41). My hypothesis is that a device such as an ever-growing and changing archive, available from course section to course section, offers learners an opportunity to stand on the shoulders of those who went before and benefit from prior lessons learned. Another aspect of my hypothesis is that elements of knowledge creation theory (Nonaka & von Krogh, 2009) can be applied to this intervention and that this theory can evolve to support socially networked online learning environments. It is "embedding the pursuit of theoretical understanding in the design and

development of educational interventions [that] sets educational design research apart from others” (p. 32).

### **Subsequent Questions Used to Support Study**

Within the frame of the research environment I develop the following seven sub-questions, which I use as the basis for follow-up interviews but are also placed as a resource document in my research study home in the Custom Elgg. These questions are repeatedly used to construct a conscious frame around an online archive and assist the research participants as they work within the social-networked learning environment.

- Having used the course archive as a resource over the past “X” weeks do you feel it has changed or altered the way you learn in this course?
- Do you feel that the archive has added value to your learning in the course? If so please name any benefits you feel you have received as a result of your engagement with the course archive.
- In your weekly discussions with your peers, how do you feel that your archive access has benefitted you in these discussions?
- Does the semi-public access to your writings (your course peers, current and future) cause you to be more or less inhibited with your writing? Knowing that your current discussions may become part of the archive for future learners has this changed how or what you say online? Does an audience, your peers in this course, inspire you to write differently or does it possibly cause you to be more cautious? Why?
- The social networking environment within which you have been working allows for different privacy settings. Have you changed your settings from the default, and if so, how has this impacted your contributions to the course discussions?

- As you examined the archive and read through the various contributions, did this cause you to generate new ideas, questions, or thoughts about your current work in the course?
- What types of issues or concerns inhibited your access and use of the archive? Please indicate if you feel that these issues might be related to the course and its design, your ability to access and use the archive, or some other concerns.

When the three core questions were originally structured I believed that each question would receive equal attention. Yet as time went on in this project, a mix of value and perceived barriers or challenges received more attention from the research participants. As will be discussed in the results chapter, the impact of the learning environment appears to also influence learner perceptions about value. This appears to challenge the students to spend time with and appreciate the value of the archive. These perceived barriers might otherwise not have been present and might have allowed the learners to focus on the usefulness of the archive instead of the things that may have gotten in the way. The above questions will be further discussed and framed within the methodology chapter and the results chapter, which follow the literature review chapter.

### **Framing the Study Questions**

The initial three research questions which form the basis of the study proposal attempt to address issues raised by Cohen et al., (2008); are they measurable and answerable, and do they take into account the multiple iterations of the research environment. These three questions, in a truncated fashion, frame much of the research conversation and are repeatedly used to focus the dialogue. They shape the conversation and they allow both the researcher and the research participants an opportunity to

continually circle back and reflect upon the potential value of the intervention: the archive. Additional sub-questions are added to flesh out further understandings and to attempt to move the conversation to a place where real life solutions might surface and support ways that this intervention can move beyond the purview of this dissertation. “Educational design research is particularly concerned with developing... usable knowledge, thus rendering the products of research relevant for educational practice” (McKenney & Reeves, 2012, p. 9). An accepted premise of this research has been that, “the goals of design research are to generate useful design interventions and refine theories” (Oh & Reeves, 2010, p. 271). In so doing, questions asked of research participants need to evolve as both participants and the researcher learn and gain insightful knowledge about the process and the context (the emerging and growing archive and tools needed to support its creation). In many ways there is a significant meta-aspect to this study in that the grounding theory of this study, organizational knowledge creation theory (OKCT), helps to inform the way that I, and at times the participants, engage both the archive and each other. Although much of the direction from both the questions and ensuing discussions revolve specifically around the core elements of the three questions, participants not only talk about aspects of OKCT but they work to engage each other using some of the principles outlined in the theory. For example, the concept of *ba* becomes, at times a conscious working element for some of the research participants. This was theory in practice.

The evolution of subsequent questions came about as new knowledge about the use, value, and perceived barriers to the use of the archive surfaced and the process by which the archive developed, evolved, and was subsequently used. Evidence of the

knowledge creation cycle (referred to as the SECI process) and the way that different *ba*'s developed, shaped aspects of the archive and prompted rich conversation and question tangents. Additionally, as the research participants began to better understand and appreciate the social-networked learning environment within which their course was occurring, their interactions with the archive, current and past members of the course, and members of the broader social-networked learning environment changed. Some participants began to offer suggestions as to the reshaping of questions leading to possible design changes for the way that the archive might be structured and used in the future. There were also issues that came to light only after the data had been analysed. These issues have been added to the results section. In particular the issue of efficacy surfaced through the many conversations of the students. Efficacy is included as a final course reflection question (efficacy as an overall issue for students in the study course iterations) and it surfaced as a significant factor and outcome of this research. My study focuses on and uses the questions as outlined in this chapter and although issues surfaced independently of these questions, these unintended results have added to and helped to contribute to the final elements of this study.

### **Chapter Summary**

This brief *questions* chapter provides an overview of the questions guiding this study. It outlines the core reach of the study through the additional sub-questions. The three main questions and the guiding conversation sub-questions help focus my study and allow the research participants an opportunity to frame their perception of the archive. As will be seen in the following literature review chapter, issues beyond the original focus of these questions come to light during this study. Through these issues, unforeseen at the

start of my study, I trust that the reader can begin to see the evolution and eventual frame that has become my research project.



## Chapter Four: LITERATURE REVIEW

### Chapter Overview

My literature review will focus on six areas/domains. These are: knowledge creation; *ba*; tacit knowledge; reflective practice; socially networked learning environments; and, efficacy.

The literature review process is critical in design-based research because it facilitates the creation of draft design guidelines to inform the design and development of the intervention that will seek to address the identified problem. In... design-based research, the literature review is a continual process. Findings from an iteration of review often promulgate further literature study as well as fine-tuning of the principles guiding the design. Inherent in the literature review is the identification of the conceptual underpinnings of the problem in order to assist the researcher to understand and predict the elements of a potential solution. (Herrington, et al., 2007, p. 4093)

Chapters 1 and 2 of this dissertation have elements of the literature threaded throughout. This literature review chapter narrows the scope of the discussion to the six domains outlined. This begins by examining the process of knowledge creation including an overview of the concept of knowledge as well as an examination of a link between knowledge and learning. The literature explores the impact of tacit knowledge and then will review the nature of reflective practice for the learner interacting with archived discussions. This reflective practice domain is based upon Schön's (1983, 1987) concepts of reflection-on-action and reflection-in-action. Next I review the literature on social-networked learning environments as it pertains to the creation and use of a learning

archive. This social networking domain was not included in my original research proposal as it was not, at the time, seen as a possible issue and/or a factor that could impact my study. This topic has, in many respects, become a cornerstone element that needs further study and appreciation as educators build learning environments to support collaborative understanding and knowledge creation in education.

My final literature domain surfaced as a result of student responses to a self-reflection question at the end of the course. As I analysed and coded the data I realized that this domain, although not recognized at the beginning of this study, was one that needed to be incorporated as part of the whole. Students were asked whether or not the course affected their net efficacy. This question, the direct responses to the question, and various conversations stemming from an understanding of efficacy cause me to realize the importance of efficacy as a key element in this study. The concept of personal efficacy became a key coded piece of the data as students articulated their beliefs about their capability to accomplish challenging goals (Patterson & Kelleher, 2005).

### **Literature in a Design-Based Study**

As indicated in the Herrington, et al., (2007) opening quote at the start of this chapter, the literature review in a design-based research study is a continual process. This review of the literature has been modified to keep pace with this study. This literature outline sets the stage for the research, supports the findings, and provides structure for the iterative nature of the study.

The literature review in a design-based study helps to reinforce the intervention and affirm issues specific to the study and the intervention (Herrington, et al., 2007). Researchers need to assume that the identified problems, or at least aspects of these

problems, have been acknowledged elsewhere and been studied. It is this literature that underlies and supports much of the direction of this study. Although there is limited evidence of specific research aimed at the issues being examined in this study, the literature domains being reviewed speak specifically to key elements of the intervention in this study and assist to legitimize the process. As McKenney and Reeve (2012) ask:

What can literature tell us about this kind of problem; this type of context; and given these, typical concerns of these kinds of stakeholders? The literature review serves two main purposes: it provides ideas, which can help shape data collection, and it can be used to identify frameworks (or important elements thereof) for data analysis... The goal of the literature review is not to find the answer to the question... Rather the goal is to unpack and understand how others have experienced this or similar problems, and to examine how and why these problems were addressed, with what results [Italics in original]. (p. 92)

## **Literature Domains**

### ***Knowledge Creation***

Knowledge, defined very broadly, is viewed as a valuable resource in many disciplines, particularly in business and management. Corporate knowledge is what sets one organization apart from another (Konno, 2013). In an educational learning context, knowledge is seen both as a process and as a resource: an attainable product. What if we look at the learning equation differently? What if knowledge, that which we seek to attain and perceive as the valued end product, was the misdirected focus of our learning? What if we focus on the learning process and not the learning product? This research, in part, examines knowledge as a process and not a product. Senge (1990) talks about the

process of learning where he states, “learning organizations [are places] where people continually expand their capacity to create results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together” (p. 3).

I examine the framework of knowledge as it is conceptualized above: what it is and how it might be viewed through different lenses. In addition, I examine the process of knowledge creation, the process of learning, and in doing so I outline the elements required to support such process environments.

Nonaka and Takeuchi (1995) discuss knowledge as a competitive resource. They cite Drucker (1993), where he argues, “knowledge is not just another resource... but [it is] the only meaningful resource” (p. 6). They quote Toffler (1990) on his belief that “knowledge is the ultimate replacement of other resources” (p. 7), and they refer to Reich (1991) where he contends that “the only true competitive advantage will reside among those he calls “symbolic analysts,” who are equipped with the knowledge to identify, solve, and broker new problems” (p. 7). “Knowledge has assumed an increasingly legitimate and important role in organization science” (Nonaka & von Krogh, 2009, p. 636). Knowledge, the process of knowing, needs to be seen as the foundational resource for any learner: this process, this understanding of what knowledge is becomes not only a company’s but also a learner’s competitive advantage. As they conclude their introduction, Nonaka and Takeuchi (1995) indicate, “despite all the attention by leading observers of business and society, none of them has really examined the mechanisms and processes by which knowledge is created” (p. 7). This study examines some of the mechanisms and processes by which knowledge is created through interactions with other

participants, the content (both teacher and peer created), and the virtual classroom in their online learning environment.

Knowing the value of understanding knowledge and the process of its creation leads us to search for the ways in which knowledge is created in formal learning contexts. This study seeks to offer alternative ways of viewing the knowledge creation process. Vygotsky (1978) introduced the idea of scaffolding in a learning context with children and elaborated on this in a discussion that he called the *Zone of Proximal Development* (ZPD). The ZPD is described as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (p. 86). Wells (1999) further indicates that:

No knowledge passes explicitly to the novice from the more expert participants, as they move together with increasing synchrony. Rather, within the framework provided by the structure of the activity as a whole, of which the entraining movements of the other participants are just one part, the novice gradually constructs the organizing cognitive structures for him or herself and brings his or her actions into conformity with the culture-given pattern. (p. 320)

Learners need a structure, a set of scaffolds that assist learners in connecting knowledge elements and upon which they then build new knowledge. Holton and Clarke (2006) define scaffolding as "an act of teaching that (i) supports the immediate construction of knowledge by the learner; and (ii) provides the basis for the future independent learning of the individual" (p. 131). The value of archived discussions and the ability to engage the archive in a meaningful way is dependent upon the pre-existing

scaffolds or construction forms that learners possess and bring with them, as well as those that the teacher frames in the course, yet the process of accessing and using archived material changes learner scaffolds by the very nature of accessing the archive (Polanyi, 1974; Tsoukas, 2011). As learners spend time using the archive and hear from others about their experiences in the archive, scaffolding structures are altered and learners develop the ability to interact with the archive in a different fashion. This research study examines the above use and the potential changes that learners may experience as a result of the use of an online archive. Scaffolds are both brought into the knowledge creation process and they are built during the process. Having an understanding of what a scaffold is and how it is built and used in the knowledge creation process is a key piece of finding value in the archive. This value can be realized as a design construct and integrated into socially networked learning environments in the future.

Creative advances in technology offer up innovative synchronous, asynchronous, and, immersive environments that move learners beyond the confines of physical space. The lead author of the article quoted later on in the literature review chapter (Erden, von Krogh, & Nonaka, 2008) expressed reservations when asked about the portability of business and management organization-based concepts to the world of online learning and education, as is intended in this study (Z. Erden, personal communication, February 11, 2009). The reservations may come from a limited understanding and use of computer-mediated learning environments and part of this study attempts to bridge the above perception gap. Throughout this study, limited perception and understanding of these new and emergent learning contexts has been one of the many challenges I have faced.

Many of the above examples throughout this document are structured within the world of organizations (Nonaka & Toyama, 2005a, 2005b; Nonaka & Nishiguchi, 2001), primarily corporate or business organizations. Within a business context these examples refer to individuals, individual knowledge creation, individual understanding of knowledge as well as different uses and meanings of the language. This study examines online learning through the lens of this business context. One of the premises of this study is that much of the research done in the world of business and management aimed at knowledge creation may be applicable to academic learning generally, and to online learning environments in particular. While there may be differences in the objectives of organizational knowledge creation, many of the processes can be seen to transcend the academic and the management worlds.

Nonaka (1991) begins a discussion of knowledge creation in a management and organizational context. This has since become a mainstream conversation (Nonaka & Takeuchi, 1995; Nonaka & von Krogh, 2009; von Krogh, Nonaka, & Rechsteiner, 2012; von Krogh, Takeuchi, Kase, & Cantón, 2013). Nonaka argues that Japanese organizations view knowledge in a holistic way quite different from the Western explicit, external view of knowledge, which is seen as something tangible outside and beyond the person. He begins by examining knowledge, through a Japanese perspective: “primarily tacit – something not easily visible and expressible” (Nonaka & Takeuchi, 1995, p. 8). Others have re-examined Nonaka’s east-west division of knowledge (Gueldenberg & Helting, 2007) and conclude that the process should be less about division and more about a broader understanding of interdisciplinary work and about developing parallel lines of understanding between these east-west schools of thought. In part, this study

examines different views of knowledge and knowledge creation. Nonaka and Takeuchi (1995) push the knowledge discussion by stating that, “creating new knowledge is also not simply a matter of learning from others or acquiring knowledge from the outside. Knowledge has to be built on its own, frequently requiring intensive and laborious interaction among members of the organization” (p. 10). The use of an online archive by a group of graduate students can foster this “intensive laborious interaction”.

de Haën, Tsui-Auch, and Alexis, (2001) discuss the social construction of knowledge within the context of OKCT and suggest OKCT is “inherently social”. They discuss this theory from the perspective of its proponents and go on to add that the theory focuses on the “social, rather than the cognitive and behavioral [*sic*], character of learning.... Knowledge is developed, reproduced, and negotiated through the ongoing interaction and practices of actors who are bound by material and social circumstances in a particular time and space” (p. 904).

Organizational knowledge creation has become a focal interest of 21st century business and management as it has proven to be a key component to the development of dynamic knowledge and knowledge processes (Nonaka & von Krogh, 2009; von Krogh, Nonaka, & Rechsteiner, 2012). I will attempt to demonstrate through this study that core components of OKCT are applicable to education, and in particular to online learning environments. After all, the “knowledge creation process relies heavily on shared experiences” (McFadyen & Cannella, 2005, p. 135). Throughout this study it is the shared learning that supports knowledge creation.

“Organizational knowledge creation is the process of making available and amplifying knowledge created by individuals as well as crystallizing and connecting it



with an organization's knowledge system" (Nonaka, von Krogh, & Voelpel, 2006, p. 1179). Organizational knowledge creation theory maps out different paths by which organizations create and capture the process of knowledge generation to affect competitive advantage. As well, this theory examines the processes inherent in knowledge creation, including elements believed necessary to support the generation of new knowledge while ensuring that these processes become embedded in the organization to allow for continued knowledge growth and development. "A central purpose of organizational knowledge creation theory is to identify conditions enabling knowledge creation in order to improve innovation and learning" (p. 1185). The above is a key component of this research study: "to identify conditions enabling knowledge creation". von Krogh, Ichijo, and Nonaka, (2000) suggest that there are five enabling factors in the process of knowledge creation. These are: instilling a knowledge vision; managing conversations; mobilizing knowledge activists; creating the right context; and globalizing local knowledge. Thomassen and Rive (2010) discuss these conditions in an educational context. These enabling conditions are further outlined within the context of online learning and they are supported in the design principles as outcomes of this study.

Two of the fundamental elements of OKCT are epistemology and knowledge creation. Epistemology, within the context of organizational knowledge creation theory is defined as "the study of the theories of knowledge and ways of knowing" (Nonaka, et al., 2006, p. 1180). Organization and management theory evolved from knowledge being seen as information and impersonal external objects (Nonaka & Takeuchi, 1995) to knowledge being embodied within individuals and being personal to the holder of the knowledge (Polanyi, 1974). Based upon the evolution of the ideas about knowledge

being personal and embedded within individuals, organizations need to understand how knowledge can be transferred or shared among individuals and beyond to the organization itself. Some (Thomassen & Rive, 2010) suggest that knowledge can only be transferred or exchanged, “when knowledge is articulated into meaningful information” (p. 157). There are challenges with respect to the process of acquiring knowledge. For example, as stated above, the inference is that knowledge is “transferred” and yet Nonaka and Takeuchi (1995) suggest, “Knowledge has to be built on its own, frequently requiring intensive and laborious interaction among members of the organization” (p. 10). When we look at an example of the knowledge creation process we encounter the word “conversion”, suggesting that one form of knowledge becomes another through a particular process.

This evolving understanding around knowledge creation and acquisition raises many questions about the theory of knowledge ranging from the tangible, explicit, Western philosophical approaches (Nonaka & Takeuchi, 1995), to the ideas of tacit knowledge (Polanyi, 1967, 1974; Polanyi & Prosch, 1977), as both an internal human process and the basis from which new knowledge is created. The basis for knowledge understanding within organizational knowledge creation theory also includes more abstract eastern understandings of knowledge based upon Buddhist philosophy (Chia, 2003; Nonaka & Takeuchi, 1995; Varela, Thompson, & Rosch, 1993).

This research touches upon elements of these epistemological areas but will more specifically focus on Polanyi’s (1974) ideas of tacit knowing, as well as tacit and explicit knowledge. Tacit knowing is generally seen as the knowledge, know-how, and knowing that each of us possess internally, whereas explicit knowledge is seen as a tangible

product: a visible expression of our knowing external to ourselves (Polanyi, 1974; Tsoukas, 2011). This research will also include a Japanese philosophical context known as *ba* or Basho<sup>3</sup>, a context within which learning and knowledge creation can occur (Abe, 1988; Krummel & Nagatono, 2012; Nishida, 1990; Nonaka, Konno, & Toyama, 2001; Shimizu, 1995; Tremblay, 2009a, 2009b). These tacit and *ba* concepts will be further explained later in this literature review chapter.

Within organizational knowledge creation theory, “knowledge is... the capacity to define a situation and act accordingly... [and] knowledge is [both] explicit *and* tacit [italics in original]” (Nonaka, et al., 2006, pp. 1181-1182). “In other words knowledge is that which has been produced through the process of observation, reflection and reasoning” (Chia, 2003, p. 954). The word knowledge is used to describe both the tangible and the intangible. This leads to a concern that if knowledge is tacit (intangible) by definition, then how can it be observed (Tsoukas, 2011)? This study will attempt to answer this question and demonstrate a context within which *evidence* of tacit knowledge can be made visible. Ultimately it is our engagement with tacit and explicit knowledge that leads to the process of knowledge creation

The second fundamental element of OKCT poses certain semantic challenges as noted earlier. As part of the knowledge creation cycle, Nonaka and Takeuchi (1995) use the phrase *knowledge conversion* to define the process of knowledge creation. Within the framework of this theory, knowledge is generated through the process of *converting* tacit understandings to a form that can be understood and articulated beyond one’s personal

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<sup>3</sup> The word *ba* is always italicized, while the word Basho is not. This formatting is in keeping with the conventions used by Nonaka and Konno (1998), and others who reference these terms in this fashion throughout their literature.

tacit world. In the context of this study, as in much of the literature, knowledge conversion is also synonymous with the term knowledge creation (Nonaka & von Krogh, 2009). The challenge with the language regarding the word conversion, however, is that in the knowledge creation cycle, conversion infers that tacit knowledge changes form. Tsoukas (2011) argues, in keeping with Polanyi's (1974) ideas of tacit knowledge, that as a result of one's tacit understanding, one is now capable of moving to other forms of knowledge and that there is no conversion process. Nonaka's (Nonaka & von Krogh, 2009) writings on this topic have evolved in the 20-plus years that this conversation has been public. Although I understand that he and others have evolved in their thinking on this issue, the language continues to challenge. Knowledge creation becomes the basis for new knowledge and meaning. The original knowledge base and the ensuing newly constructed knowledge may be a combination of explicit or tacit knowledge and the process of creation can occur in different ways. In the end it is the process and not the knowledge itself that enables knowledge creation. In Nishida's (1990) words, "it is not that there is experience because there is an individual, but that there is an individual because there is experience" (p. 19).

Nonaka and Takeuchi (1995) proposed a knowledge creation model that involved four elements: socialization; externalization; combination; and, internalization (SECI). This process model is important and a key element in helping to visualize the process of knowledge creation. As outlined earlier, knowledge as an idea or concept can be understood in different ways and at different levels. Nonaka's SECI model helps to articulate the process by which we engage each other as we develop and acquire knowledge. These four elements are described in the following manner. Socialization is

seen as the process of sharing tacit knowledge among individuals. For example, “the apprentice system is a typical method of transferring knowledge through socialization, where the apprentice observes the master to acquire know-how through imitation and practice.... Socialization is a process of sharing knowledge with others through commitment, discovery, and action” (Nonaka, Toyama, & Hirata, 2008, pp. 20-21).

Externalization is the process of articulating one’s tacit understandings into more explicit forms. “Externalization at its finest produces what Husserl termed ‘*eidetic intuition*,’ or insight into an essence. It is the ability to grasp and express an *eidōs* or a form and therefore requires great strength of imagination [Italics in original]” (p. 22). This may include the use of language in a very broad sense.

Combination is the combining of these different explicit elements into further explicit forms that allow individuals to interact with explicit knowledge. A current example of combination is the development of open source software. Individuals from all over the world have shared their knowledge to expand and further develop many complex applications and operating systems. In a world of global efficiencies, programmers have combined their understandings and explicit processes and through multiple iterations of this sharing have developed a rich and unique product (Nonaka, Toyama, & Hirata, 2008).

Finally, internalization is an individual process of reinterpreting explicit knowledge along with one’s tacit knowledge and from this experience building new tacit knowledge “Internalization is the process by which we reflect on the meaning of what we have learned from our actions and simultaneously convert explicit knowledge into [a]

skill that can be used at will.... This is explained... by Schön's (1983) idea of 'reflection-in-action'" (p. 24).

Nonaka and Takeuchi refer to this SECI process as the knowledge cycle; they see knowledge creation is an ever-expanding cycle. There are multiple dimensions to knowledge and the processes by which knowledge is created. This study will not examine all of these dimensions. Organizational knowledge creation theory, however, acknowledges these dimensions as well as where the SECI model fits within the knowledge creation process. In the years since this model was introduced, the SECI model has been modified, and reinterpreted by the original authors and others (Chia, 2003; Choo, 1998; Choo & Bontis, 2002; Cook & Brown, 1999; Davenport & Prusak, 2000; Gourlay & Nurse, 2005; Ichijo, von Krogh, & Nonaka, 1998; Kenny, 2001; Nonaka & Toyama, 2007a; Nonaka, et al., 2006; Nonaka & von Krogh, 2009; Nordberg, 2006; Spender, 1996; von Krogh, Ichijo, & Nonaka, 2001), yet the core SECI process has become a staple within management literature and is the basis for a wide variety of tangential and evolutionary discussions. For example Chen, McQueen, and Sun (2013) use the SECI model as the foundation for their examination of knowledge transfer and knowledge building at offshored technical support centres. They state, "unlike the other models, the SECI spiral explicitly considers the interaction of explicit and tacit knowledge, spiraling through the individual, group and organizational levels. The SECI spiral model has been widely used in knowledge management research" (n. p.). In this study I attempt to link the four SECI stages to student engagement with the archive.

OKCT puts forward an epistemological framework supported by an enabling approach to the creation of knowledge. This is a successful model (Nonaka, Toyama, &

Hirata, 2008) albeit one that appears better suited to certain specific cultural approaches in business: more specifically the Asian marketplace. It is recognized that this theory and ensuing discussion regarding key elements of this theory are primarily based upon Japanese business models (Glisby & Holden, 2003) and Buddhist philosophy. It is also understood that many of these ideas have not been fully adopted by western-based management thinking (Chia, 2003; Nonaka & von Krogh, 2009; von Krogh, Nonaka, & Rechsteiner, 2012). In a global business marketplace as well as a global education marketplace where online offerings transcend traditional barriers, a broader mix of ideas and cultures can only serve to enhance education and deepen our understanding of learning and knowledge creation within online education. OKCT and its key cross-cultural elements need to be examined through the lens of online learning environments in an attempt to foster a more shared understanding of the knowledge creation processes experienced by online learners.

OKCT offers a comprehensive model supporting the creation of knowledge. Research in this area continues to push the bounds of this topic (von Krogh, Nonaka, & Rechsteiner, 2012). There is little in the conversation as a whole that goes beyond the purview of business management and leadership, despite the fact that much of the model appears most suited to support knowledge creation in online learning environments. Certain elements of this conversation are being explored in academic settings (Thomassen & Rive, 2010); however, there are a limited number of examples to work with. The epistemological perspective acknowledging Polanyi's (1974) tacit knowing, the process of making our personal tacit world an extensible component of that world beyond us, is very much a day-to-day struggle for the online learner. Learners continue

to struggle, for example, to find ways to express their understanding of material they have learned or to write in a way that clearly explains concepts or ideas. Although we might not refer to learners in an organizational sense, the process of organizational knowledge creation is very much an aspect of online learning.

“Knowledge creation is a continuous, self-transcending process through which one transcends the boundary of the old self into a new self by acquiring a new context, a new view of the world, and new knowledge” (Nonaka, Toyama, & Konno, 2000). Knowledge creation poses a variety of concerns with regard to understanding language use. The most significant of these issues is the struggle to come to a common understanding of knowledge as a term and a concept. The noun, knowledge, is defined in multiple ways (Knowledge, 2010) in both a business and an education context. The literature pushes the bounds of its use and intent, (Chia, 2003; Choo, 1998; Choo & Bontis, 2002; Collins, 1993; Davenport & Prusak, 2000; Findlay, 2003; Gourlay, 2006a; Gourlay & Nurse, 2005; Nonaka, 1991; Nonaka, 1994; Nonaka & Takeuchi, 1995; Nonaka & Toyama, 2007a, 2007b; Nonaka, Toyama, & Byosiére, 2003; Nonaka, Toyama, & Hirata, 2008; Nonaka, von Krogh & Voelpel, 2006; Nordberg, 2006; Popadiuk & Choo, 2006; Spender, 1996; Thomassen & Rive, 2010; von Krogh, Ichijo, & Nonaka, 2001; Wise & Duffy, 2008) in part due to the generally implied umbrella-way that the term is used and understood in both business and education settings. The nuances of the language begin to create an impact when others terms are introduced in an attempt to clarify the current use of the word. In my study, knowledge (both tacit and explicit), learning, information, and data are words used to support each other. Through our general use of these words, we end up creating a lack of clarity in their meaning and



our understanding of them. This also surfaces when we talk about the process of knowledge creation. Ultimately both the context and specific intent attached to the use of these words need to be recognized in order to ensure clarity of meaning particularly as the words are used throughout this study. This is particularly true of the SECI process, but in this regard we will see how the term knowledge shifts throughout the knowledge creation process. I will attempt to clarify, define, and redefine where necessary, my use and intent of these words throughout this document.

“Judgement establishes conceptual knowledge, i.e., knowing in a strict sense. Judgement consists of the subsumption of a particular subject by a universal predicate, so a subsumptive judgement is the purest and most fundamental form” (Abe, 1988, p. 359). From the perspective of the field of organizational knowledge creation, knowledge is defined as “justified true belief” (Nonaka, 1994):

Such a definition gives an impression that knowledge is something objective, absolute and context-free. However, it is humans who hold and justify beliefs. Knowledge cannot exist without human subjectivity and the contexts that surround humans. “Truth” differs according to who we are (our values) and the point from which we look at it (our context). In organizational knowledge creation, it is these very differences in human subjectivity that help create new knowledge. (Nonaka & Toyama, 2007a, p. 15)

Wise and Duffy (2008), “begin by making the distinction that knowledge is fundamentally different from information in that it implies the evolving state of meaning of an active knower” (p. 182). “Knowledge is created by people in their interactions....

human beings have different subjective viewpoints, and these differences are necessary for the creation of knowledge.” (Nonaka, Toyama, & Hirata, 2008, p. 8).

We should understand knowledge primarily as process, created and used in relation with the knowledge of other human beings who exist in relation with others. Even when knowledge seems to take a concrete or substantial form such as in a product, it embodies past processes... and it *becomes* new knowledge when it is *experienced* by customers, which triggers another new knowledge-creation process [Italics in original]. (p. 10)

Note that knowledge is defined as justified true belief, which is further refined as a subjective intangible that resides within an individual, is dynamic in nature, and evolves based upon interactions each has with others. Note also that knowledge is not stated to have a tangible form; rather that it may “seem” to take on such a form. This refinement of the term knowledge may cause us to rethink our understanding of how we refer to the archive; the discussions, comments, and documents left behind by learners in online learning settings. The archive could be seen to contain examples or evidence of knowledge as process, as described above, and the archives, which contain “past processes”, allowing current learners an opportunity to trigger new knowledge creation processes. In an education setting, Thomassen and Rive (2010) argue that:

Knowledge is considered as information which is part of a meaningful and social context like a group or a virtual community .... As such, knowledge cannot exist outside an individual or a group .... As a consequence of this approach, only information and not knowledge itself can be stored or transferred between individuals. (p. 157)

These authors continue this line of reasoning by suggesting; “the only way knowledge can be exchanged is when knowledge is articulated into meaningful information” (p. 157). These authors do not define “meaningful” and I do not see any contradiction in these definitions because we use the word information to define the term knowledge. We have to be careful how we choose to define the content of the archive. Is it articulated knowledge or explicit knowledge (information) waiting for someone to come along and use it or experience it and then it becomes new knowledge in the hands of the recipient? Does the archive embody past processes as outlined by Nonaka, Toyama, and Hirata, (2008)? Wise and Duffy’s (2008) distinction above, appears to be supported by Tomassen and Rive’s (2010) definition and may reaffirm the use of the term information to describe the contents of the archive. What needs to be additionally examined is whether there is any filtering of the contents of the archive by the learner and how this might impact its meaning or value.

Castells (2000) states that knowledge is “a set of organized statements of facts or ideas, presenting a reasoned judgment or an experimental result, which is transmitted to others through some communication medium in some systematic form [*italics in original*]” (p. 17). This definition suggests that knowledge is something explicit and is transmitted to others, but the author extends this to the idea of “action of knowledge upon knowledge itself” (p. 17). In their discussion of how companies generate, codify, and transfer knowledge, Davenport and Prusak (2000) make the point, “knowledge is as much an act or process as an artefact or thing” (p.53). Choo (1998) examines the knowing organization and describes the creation of knowledge as “recognition of the synergistic relationship between tacit and explicit knowledge... and through the design of social

processes that create new knowledge by converting tacit knowledge into explicit knowledge” (p. 8). It is the process that is knowledge and having knowledge of the process and knowing how to use the process that ultimately gives the learner the power to manage and control their learning and their ability to create new knowledge.

van Eijnatten and Putnik (2005) examine learning versus knowledge creation and conclude that “Nonaka’s theory focuses on knowledge creation.... We think that learning and knowledge creation can be viewed as indications of one and the same communicative interaction process, seen from different angles or perspectives” (p. 536). They refer to Stacey (2003), where he states, “learning is the activity of interdependent people and can only be understood in terms of self-organising communicative interaction and power relating in which identities are potentially transformed” (p. 325). This falls in line with the work of Perry (as cited in Entwistle & Peterson, 2004) where he examines student learning and concludes, among other things, that learning and knowledge acquisition is an evolving developmental process. Entwistle and Peterson (2004) examine the relationship between knowledge and learning. They bring the two terms together and describe this as “changing as a person” (p. 409).

Whether the term learning can be used as a reasonable facsimile for the term knowledge creation or whether the term knowledge is best kept as a vehicle to describe a process separate and apart from learning appears to depend on the context. At times throughout this document I appear to use the word knowledge as a verb instead of the word knowing when describing knowledge as a process. I am not attempting to change the rules of grammar; however, I am attempting to place my use of the word knowledge in terms of an overall process. OKCT deals with a social process of the creation of

knowledge, which is process that generates tangible results, yet in itself it is not something that is tangible. There are tangible products that come from the knowledge process but these tangible products are not knowledge; rather, they are products of the process of knowledge creation. Knowledge as a human process rather than an external product is an important consideration as we further examine the environment within which students in my study are actively engaged. The language in the literature does suggest that artefacts in the archive are best described as information, which may be used to support knowledge creation.

The social-networked nature of the learning environment within this study allows for interactions between and among learners and others. These interactions offer a definitional ground for knowledge creation: “knowledge is created by people in their interactions” (Nonaka, Toyama, & Hirata, 2008, p. 8). “Knowledge primarily [is a] process, created and used in relation with the knowledge of other human beings who exist in relation with others” (p. 10). “Knowledge is considered as information, which is part of a meaningful and social context like a group or a virtual community” (Thomassen & Rive, 2010, p. 137). Additionally, these authors indicate that managing conversation is a factor in the process of knowledge creation. “Good conversations are the cradle of social knowledge and the most important enabler of knowledge creation” (Thomassen & Rive, 2010, p. 159).

It can be argued that much of the above could also exist in environments other than social-networked online environments. Could this not exist in a face-to-face environment or online using a learning (or content) management system (LMS)? What is unique about this networked social learning space (the study environment) is the access,

structure, control, and persistence of the environment. The boundaries of this custom instance of Elgg provide users and groups with a greater degree of autonomy as well as control over their contributions. Users can add or delete content as and when needed or wanted. They can contribute and publish within class spaces, within their own individual spaces, within private or public groups that they create or join or with the whole Internet including search engines. In addition, users have complete control over who reads and/or comments on their contribution both individually and within groups and classes.

Courses, including all of the learner contributions held within this environment do not disappear after the fact and are not removed unless specifically done so by the author of a specific contribution. This is a social learning space where interdependent people exchange information and ideas, develop knowledge, and learn. This is a social learning space.

Knowledge is created through interaction between individuals as well as between individuals and their environment (Accorsi & Costa, 2008). Knowledge creation is a human activity, and the process of knowledge creation is “necessarily context specific in terms of time, space, and relationships with others. Knowledge cannot be created in a vacuum... it needs a place or context that enables the interpretation of information to construct meaning and become knowledge” (Nonaka, Toyama, & Hirata, 2008, p. 34). The literature reinforces an understanding that knowledge has many facets and that these different perspectives on knowledge combine to give a more complete view of the process of the creation of knowledge. Within the framework of OKCT, the key element that underpins and mirrors the steps in the SECI process also provides a context, and it is

this context that enables the process of knowing. This knowledge creation context is referred to as *ba*.

### ***Ba***

Embedded within OKCT is a condition or context within which knowledge creation is enabled. The social network that forms the context of this study is novel and complex. Thus we turn our attention to models for describing and exploiting such complex contexts. This context is known as *ba* or Basho (Nonaka & Konno, 1998). Basho is the word originally used by Nishida (Tremblay, 2009a). The word *ba* appears to be used interchangeably with Basho, and throughout this document the word *ba* will primarily be used unless a source dictates otherwise. This Japanese concept has been roughly translated as space or place (Krummel & Nagatono, 2012; Nonaka & Takeuchi, 1995) although others (Chia, 2003; Shimizu, 1995) have argued that space or place is an imprecise definition. Raud, (2004) argues that place is probably the more accurate definition based upon an examination of Nishida's language use and intent. "The meaning of place with *basho* is not about a static point, such as geographic or hierarchical place; instead, place creates a way of understanding a dynamic and relating sense of belonging requiring further explanation [*italics in original*]" (Iverson, 2011, p. 46).

*Ba* might more appropriately be seen as context, and as such, *ba* is formed when individuals develop a common understanding (a synchronicity) of the meaning of their togetherness and these individuals have a common sense, a knowing-belonging of their time together. Shimizu's (1995) homeowner and guest example, outlined earlier, are an example of this synchronicity or common understanding. The meaning of their togetherness may shift but the *ba* is maintained if those involved understand the shift in

meaning and maintain the intent of their interconnection. *Ba* is seen as a communal place of coming together where each and the space becomes one and by creating a oneness with the space each has the potential to engage the other. As described by Nonaka and Konno (1998), this oneness within *ba* allows for knowledge to be created. *Ba* carries with it a non-dualistic approach, which suggests that the individual and the place or space are not separate entities. It can be seen as “pure living experience where facts are encountered just as they are prior to our own conceptual fabrications” (Chia, 2003, p. 971). Added to this, the individual is seen simultaneously as a whole and part of a larger whole.

This concept, *Basho*, was originally developed by the Japanese philosopher Kitaro Nishida (Abe, 1988; Tremblay, 2009a; Krummel & Nagatono, 2012) and has been modified and expanded through the research and writings of others (Shimizu, 1995; Nonaka & Konno, 1998; Nonaka, Konno, & Toyama, 2001). Nishida first introduced the concept of *Basho* as a means of describing physical space (Tremblay, 2009b), although his writings quickly moved the term to suggest that, “the *Basho* is considered to be that which ‘encompasses.’ In other words, the *Basho* is the place in which content is located” (p. 128). Nishida wrote at length about his “logic of place” (Abe, 1988). It is this place, or *Basho*, that was developed into Nishida’s concept of *absolute nothingness*: the final *Basho*, a *Basho* of *Basho*’s, a space containing all other spaces. Nishida saw this as a “relationship between a place and that which lies within it” (Abe, 1988, p. 364). *Basho* “does not allow the separation of the subject of the observer from the world observed and thereby moves spatiotemporal concepts into the ontological domain” (Raud, 2004). Nishida placed *Basho* in the present (Tremblay, 2009b) and he challenged the notion of



time. In so doing he states, “The self does not exist in time, it is time that exists in the self” (p. 131).

Both Nishida’s and Shimizu’s understandings of *ba* have been adapted to facilitate the ideas inherent in knowledge creation (Nonaka, Konno, & Toyama, 2001). As Nonaka and Toyama state (as cited in Nonaka, Toyama, & Hirata, 2008), it is seen as a shared context in motion, that is “an existential place where participants share contexts and create new meanings through interactions” (p. 34): “*Ba*... can transcend time, space, and organization boundaries to create knowledge” (Nonaka & Toyama, 2003, p. 2). “*Ba* should be ‘energised’ to give energy and quality to the SECI process” (Nonaka, Toyama, & Konno, 2000, p. 25).

We have another picture of the world, Basho, where the border between man and the environment is removed: man becomes a constituent of Basho. Consequently, man observes the Basho from the inside.... In Oriental philosophy, the world is observed from the inside, from the internal point of view. (Shimizu, 1995, pp. 68-69)

Nishida (as cited in Nonaka, Toyama, & Hirata, 2008) indicates that, “the essence of *ba* is ‘nothingness.’ This does not mean that nothing exists in *ba*. It means that in *ba*, one exists in relationship with others rather than in the atomistic sense of absolute self” (p. 36). The concept of nothingness might suggest that relationships should or could not exist, yet this concept acknowledges one’s existence in relation to another. As indicated earlier in this section, the concept of *ba*, and in particular Nishida’s Basho, are challenging constructs to place within either a business or an educational context, particularly if one attempts to remain true to Nishida’s philosophical focus. What seems

reasonable, in light of the focus of this research, is to take a cue from Nonaka and Takeuchi (1995) and construct a meaning based upon intent keeping as faithful to Nishida's underlying Basho construct as possible. Nonaka and Toyama (2007b) refer to *ba* as a "shared context in motion, where knowledge is shared, created, and put to use" (p. 381). "[*Ba*] can be a physical, virtual, or mental space but all three have knowledge embedded in *ba* in common, where it is acquired through individual experiences, or reflections on others' experiences" (Nonaka, von Krogh, & Voelpel, 2006, pp. 1185). Nonaka and Takeuchi (1995) ground *ba* in OKCT and they support this with a critical examination of Japanese philosophical and intellectual tradition. Nonaka and Konno (1998) "ground the concept of *ba* in an existentialist framework"; they go on to describe this place of knowledge emerging "in individuals, working groups, project teams, informal circles, temporary meetings, [and] e-mail groups" (p. 41). *Ba* is context and as such *ba* embodies the interactions among participants toward understanding and knowledge creation. It is formed when individuals develop a common understanding of their being together, and these individuals develop a shared knowing to their time together. As indicated earlier, the meaning of their togetherness may shift but *ba* is maintained if those involved understand the shift in meaning and maintain the intent of their interconnection.

Another way of looking at *ba* is by seeing it as context. In doing so, context must be seen as an environment within which both or all parties in a conversation are immersed in this context. *Ba* theory considers that this shared environment is more than physical, it is a mutually provoked relationship that is emergent during conversation. This context or environment evolves as one's engagement with the conversation deepens

and participants in this conversation become increasingly removed from their prior space. Conversation evolves and is affected by the nature of the *ba* and thus the context evolves along with the conversation. This context takes on aspects of Polanyi's (1974) subsidiary awareness in that these unseen but influential or guiding elements shape the conversation, but at the same time are constantly being reshaped as a result of, and during, the conversation. *Ba* is a dynamic and live process held aloft non-verbally by all in the conversation. For *ba* to exist, conversants must step out of themselves within the conversation and engage each other at the level of intent such that there is no distinction between speaker and listener, and the life of the conversation can then exist at a subconscious level. Thus *ba* is seen as a non-dualistic concept: speaker and listener are one (Otsuka, 2011).

Nonaka and Konno (1998) expand upon the knowledge creation cycle (the SECI model) and add four corresponding types of *ba*. These four are: originating *ba*; interacting *ba*; cyber *ba*; and exercising *ba*. Examples of these four types of *ba* will come from the environment within which my dissertation research takes place. Before I expand on these four types of *ba*, I wish to attempt to avoid confusion by indicating that later in this section I will also introduce five features which help support the creation of *ba*. The four *ba* types that correspond to the SECI model noted above deal quite specifically with four characteristics related to the process of knowledge creation whereas the five factors discussed later are "features of *ba* that must also be present in order for the *ba* to be an effective place for knowledge creation" (Nonaka, Toyama & Hirata, 2008, p. 37). Now I would like to expand on the four factors corresponding to the SECI model.

Originating *ba*, which corresponds to the socialization process of the SECI model “is the world where individuals share feelings, emotions, experiences, and mental models... This is the primary *ba* from which the knowledge-creation process begins” (p. 46). An example of this in the research environment is the open online discussion area where students discuss the course and assignments in a general way and work through their challenges and concerns with each in these open forums. This form of *ba* also appears in synchronous web conferences. Following through with the SECI knowledge spiral the next category is interacting *ba* corresponding to the externalization process. This *ba* “is more consciously constructed.... Through dialogue, individual’s mental models and skills are converted into common terms and concepts.... [This] is the place where tacit knowledge is made explicit” (p. 47). My research environment is a carefully and deliberately constructed learning space designed to encourage engagement with exercises designed to elicit conversation. The professor observes the dialogue and engages in it where it is felt necessary to assist the learners as they navigate through the language of the course and come to common understandings of terms, as well as being able to navigate through the course material in a shared and collaborative fashion.

Cyber *ba*, representing the combination phase of the SECI process “is a place of interaction in a virtual world.... The combination of explicit knowledge is most efficiently supported in collaborative environments utilizing information technology” (p. 47). Examples of this within my research environment include the use of different technologies to allow learners to engage with each other, the professor, and the content very much in keeping with the development of social and teaching presence described in the Community of Inquiry Model (Anderson, Rourke, Garrison, & Archer, 2001;

Garrison, Anderson, & Archer, 2000; Garrison, Anderson, & Archer, 2010; Rourke, Anderson, Garrison, & Archer, 1999). Technologies used within and to support cyber *ba* included asynchronous tools such as discussion areas of the Custom Elgg environment, email, wikis, and collaborative commercial production tools such as Google Docs. Additionally, synchronous tools included products such as Elluminate, Adobe Connect and Skype.

The final *ba*, exercising *ba*, “facilitate[s] the conversion of explicit knowledge to tacit knowledge.... Exercising *ba* synthesizes Nishida’s world and the Cartesian world through action, while interacting *ba* achieves this through thought” (p. 47). In many ways this form of *ba* encompasses my research as a whole: this is the use and subsumption of artefacts in the support of knowledge creation. Learners engage each other initially through originating *ba* and have become familiar with their learning environment and each other. As they begin to embrace the language of their learning they are enveloped by interacting *ba*, a carefully and consciously constructed environment that allows them to be guided and then to focus on the learning tasks. Their online world is becoming explicit. Through the support of the professor and their peers they are encouraged to articulate and further create explicit elements to be shared and offered in a collaborative way. They add to the archive and they develop new understandings as they create new knowledge. This is the essence of exercising *ba*. As the process of knowledge creation evolves, the adding process should become an element of the learner’s process of learning and knowledge creation. Learner involvement within the learning space, cyber *ba*, becomes intuitive. Online tools become less of an impediment as learners become more familiar with these tools and, as a result, their

learning spaces become places of unimpeded engagement leading to the final, exercising *ba*. This last form of *ba* is where knowledge is created and it is as a result of learner engagement and interaction with peers, course materials, the professor, and the archive that knowledge is created. One acquires tacit knowledge through this process. There is a possible connection here with Garrison, Anderson, and Archer's (2000) Community of Inquiry (COI) model.

The use of *ba* in a business or management context has raised questions about its value and its place within a business management context (Glisby & Holden, 2003; Gourlay, 2006a; Gourlay & Nurse, 2005, Nordberg, 2006) yet the reasoning for this questioning appears weak, at best. Nordberg (2006) states that "attempts by Nonaka and colleagues to explain the need for the mysterious '*ba*'... is still quite difficult to explain" (p. 9). One of the challenges to this thinking lies in the concept of dualism. I am not suggesting that in an Eastern, Buddhist sense there is no dualism (Garfield, 2009; Harvey, 2009, p. 266), despite the fact that much of Nishida's work "focussed on stratifying a non-dual paradigm" (Kopf, 2009, p. 359). The issue at hand and the struggle with the concept of *ba*, as well as Nonaka's knowledge creation theory, have more to do with how this challenges Cartesian dualism and a Western philosophical view. In Western thinking there is the perspective of separation of subject and object: that mind and body are two very different aspects of one's being. This dichotomized view colours our world and shapes how we operate in business and how we structure our educational environments. *Ba* and its underlying foundation is an attempt by Nishida to, on one hand, recognize Western dualist thinking while on the other hand, find ways to see the world through "self-mirroring, self-awareness" (Krummel & Nagatomo, 2012, p. 17). Nishida

recognizes the nature of Cartesian dualism and shows through his writings that the mind-body divide is more a continuum within the self and extends beyond in a form of entrainment.

In their research into learning and knowledge creation in collaborative networks, van Eijnatten and Putnik (2005) examine *ba* and its implications as an alternate view of learning in Collaborative Networked Organizations (CNO). They conclude with the statement, “we think Nonaka’s concepts – especially the distinction between physical versus virtual Bashi – might be helpful for a better holonic understanding of the complex interplay between individual, organizational, and inter-organizational learning in CNO’s” (p. 536). The term holon refers to something that is simultaneously a whole and a part of a whole. It comes from the Greek “holos” meaning whole with the suffix “on” suggesting a part of the whole (Dominici, 2012; Koestler, 1990; Simon, 1996). van Eijnatten and Putnik view *ba* as a “holonic concept”.

*Ba* exists at many levels and these levels may be connected to form a greater *ba* (known as a *bashi*). The self is embraced by the collective when an individual enters the *ba* of teams. Just as the *ba* for individuals is the team, the organization in turn is the *ba* for the teams. Finally, the market environment is the *ba* for the organization. *Ba* is of fundamental importance for knowledge creation, and this creative process is amplified when all these *ba* conjoin to form a *bashi*. (Nonaka & Konno, 1998, p. 41)

Nomura (2002) talks about the impact of designing *ba* as a successful knowledge strategy:

*Ba* connects knowledge workers to create, share, and utilize knowledge.... If the objectives of *ba* do not apply to business strategy, it is difficult for people to get together frequently. If the atmosphere of *ba* does not fit to corporate culture and work style, people do not like to gather. (p. 266)

This is a valuable comment with respect to learning environments as well. If we transpose the above quoted business-focused language for language more centred on learning, some of the potential challenges inherent in attempting to build *ba* become evident. There needs to be a reason for individuals to want to gather and participate. This can be said for most approaches to learning. Individuals can be brought together in learning environments but getting them to act together for a common purpose can be a challenge. Factors such as the nature of the learning environment, or the task, or a clear understanding of the purpose of their being together can all become impediments to the creation of *ba*. However, as outlined earlier with the four elements of *ba* corresponding to the SECI process, *ba* can be crafted within a learning space as the context within which knowledge can be created, and can continue to be an element in support of learning within this online social space.

*Ba* does not demand participation. *Ba* is a construction designed to support the bringing together of minds for a common purpose. It is fluid and dynamic and not everyone chooses to participate. Anyone can remove themselves from *ba* and the related conversation and create their own *ba*, have their own intention and act accordingly. This is the challenge of developing and maintaining *ba* particularly within virtual environments. As indicated earlier, *ba* needs to be carefully constructed and maintained



which allows both the teacher and the students opportunities to engage where needed or wanted and when not.

The creation of a context upon and through which these knowledge creation processes dwell is key to the interaction of learners in online settings (Anderson, 2003; Anderson, 2008b; Dron & Anderson, 2007; Garrison & Cleveland-Innes, 2005). *Ba*, as a fundamental context element in this equation, adds a further multidimensional aspect to the engagement process that learners participate in as they develop their understandings of the knowing process. These elements together form the basis of an inquiry that offers insight into learner processes threaded through an online learning matrix and better adds to an expanding body of work in this field. If we examine interaction theory (Anderson, 2003, 2008a, 2008b; Dron & Anderson, 2007; Garrison & Cleveland-Innes, 2005) and communication theory (Boyd, 2004; Metcalfe & Game, 2008; Scott, 2001; Wise & Duffy, 2008) as supportive elements in online learning, then the possibilities of *ba* being an integral part of technology mediated learning remain viable.

Is *ba* a community of practice? Can these two concepts be considered similar ideas? A community of practice has been defined as “groups of people informally bound together by shared expertise and passion for a joint enterprise” (Wenger & Snyder, 2000, p. 139). “A sense of community is focussed on a practice.... CoPs can be viewed as a social mechanism for understanding or even creating knowledge... [and can be] understood as sets of individuals who are enacting knowledge” (Iverson, 2011, p. 35). In response to this concept and community of practice’s possible relation to *ba*, Nonaka, Toyama, and Hirata (2008) are drawn to this discussion.

*Ba* is a place for knowledge creation while the boundaries of a community of practice are firmly set by the task, culture, and history of the community, the boundaries of *ba* are fluid and can change quickly. While membership in a community of practice is fairly stable, and it takes time for a new member to learn about the community and become a full member in the practice, membership in *ba* is not fixed; participants come and go. *Ba* is created, functions, and disappears according to the needs of the participants. Whereas members of a community of practice belong to the community, the participants in *ba* relate to the *ba*. (pp. 36-37)

The above quote is relevant to the broader conversation in this research study for several reasons. The author's use above of the word learning in opposition to the words knowledge creation cause me to want to push this conversation in a different direction. Throughout my dissertation I attempt to close the gap between learning and knowledge creation. I do not suggest that these two terms are completely synonymous. As outlined in several places throughout this dissertation, there are key elements of each that sufficiently overlap. Although I agree with Nonaka et al. (2008), particularly with respect to the fluidity of *ba* versus the more structured and stable aspects of a CoP, I am challenged by their "*learning – knowledge creation*" comments at the start of the quote. This is worthy of further discussion within the context of *ba* but not necessarily in the context of this dissertation. What needs to be noted is that although *ba* is very much a transient space, a state of being, it is and can be something that is created and managed in such a way as to foster a connection between and among learners and hold together elements of an online learning environment. *Ba* is as Nishida outlined (Krummel &

Nagatomo, 2012), a shared place of awareness of self-awareness. Structured within a sense of shared awareness and togetherness in the process of learning and knowledge creation, *ba* can offer a rich and safe learning space.

The value of communities of practice within online learning environments (Yang, 2009) is not questioned. The issue is that although appearing to be similar, communities of practice and *ba* serve different purposes and although elements of one can impact the other, the two are not mutually exclusive. Iverson, (2011) examines communities of practice in light of knowledge, knowledge creation, and belonging and brings into his discussion an “explanation of Japanese connectedness and identity” (p. 46) by threading in both Nishida’s *ba* as well as a further discussion on the value of place within Japanese society. Iverson acknowledges, “*ba* is a collectively enacted group construct [and that] *ba* provides the beginning of a group-based understanding that connects to identity as well as organizing processes” (p. 48). He further argues that belonging brings context to the knowledge process and “when knowledge is enacted, shared, and developed in organizations, communities are developed, and communities are enacted through the process of belonging and identification, knowledge is also shared and developed (enacted)” (p. 48). Iverson posits that it is the processes and the interaction between these processes that underscores CoP theory. Iverson’s (2011) thesis is that communication is a central element of organizational knowledge creation. Aspects of community of practice theory reinforce this thesis. By threading in Nishida’s *ba* Iverson shows the relationship between *ba* and CoP and how they support each other in the process of knowledge creation.

Nonaka and Konno's (1998) four types of *ba*, as discussed earlier, can assist with a better understanding of the nature of *ba* within formal learning environments. This research study builds a bridge between the worlds of business organizations and online learning environments such that the concepts of *ba*, examined above, might effectively be ported into education. *Ba* is a key element in knowledge creation and at the core of OKCT. *Ba* acts as a facilitator for the exchange of tacit and explicit knowledge. This study also shows that online learning environments can be structured to allow *ba* to be developed as a core foundational element across instructional approaches. If we understand *ba* as described by Nonaka and Toyama (2003) above, we should see that online learners are able to appreciate and understand their commitment to *ba* and understand its impact of their engagement with the learning process. In a discussion on conversation theory Wise and Duffy (2008) state that, "the lack of a shared practice as common ground is a major factor in the shortcomings of discussion forums often found in online courses and in the attempts to create online communities of practice" (p. 181). Ultimately *ba* is a commitment. Individuals need to want to be a part of *ba* for *ba* to be of value. But *ba* is not just a commitment on the part of learners. *Ba* needs to be consciously constructed, nurtured, and maintained by the teacher or instructor, or using the language of management, "each *ba* must establish actual work objectives and clarify intention, and middle management must be at the center [*sic*] of this activity" (Nonaka, Hirata & Toyama, 2008, p. 37). There is a clear connection between this understanding of *ba* and the three presences, and the Community of Inquiry model described by Garrison, Anderson, and Archer (2000).

How is *ba* created and are there factors which help outline the creation of *ba*?  
Nonaka, Hirata and Toyama (2008) state:

A *ba* does not necessarily arise because someone has provided the space and gathered the people. There are a variety of features of *ba* that must also be present in order for the *ba* to be an effective place for knowledge creation [italics in original]. (p. 37)

These authors propose five factors:

First a *ba* must be self-organized and possess its own intention, objective, direction, and mission. Without intention, there is no way to direct the energy of the *ba*, and chaos will rule.... Second, *ba* participants must establish a shared sense of purpose. The sharing of subjective, tacit knowledge and values helps develop intersubjectivity.... Third, *ba* requires participants with different types of knowledge. *Ba* is a shared situation or time-space nexus where the various subjective and historical dimensions of the members of the *ba* intersect and their heterogeneous experiences interact.... Fourth, while *ba* needs boundaries these must be open. The possibilities for expanding contexts are limitless, so meaningful context-sharing requires boundaries.... Fifth, a *ba* requires the commitment of participants. Indeed commitment is the basis of human knowledge-creation activity (Polanyi, 1966) and the source of energy driving interaction within the *ba*. Knowledge is formed when *ba* participants are both committed to the *ba*'s objectives and willingly engage in its events and activities, even contributing their own personal time and energy. For this, the *ba* needs a process of mutual understanding, trust, and respect, as well as shared perceptions and active empathy [italics in original]. (p. 37-38)

These five factors offer aspects of a possible model for online learning and they speak to the design principles that surface from this study. New knowledge is created at the intersection of knowledge domains and context at these intersections is essential for knowledge creation. “*Ba* is where knowledge becomes visible” (Konno, 2009, p. 6)

Anderson (2008a) outlines the following:

The community-centred lens allows us to include the critical social component of learning in our online learning designs. Here we find Vygotsky’s (2000) popular notions of “social cognition” relevant, as we consider how students can work together in an online learning context to collaboratively create new knowledge. (p. 51)

We are seeing the proliferation of new types of communities and networks that exist far from the formal constraints of educational communities. These social software networks... support millions of participants in the creation of friendship and sharing networks. We are only beginning to understand how these environments can be useful for formal education. (p. 52)

Tying both the interconnectivity of the networks together with those benefiting from these networks and related environments we can see how *ba* informs the knowledge creation process. In this context Nonaka, Hirata and Toyama (2008) state “when contexts are shared in motion within a *ba*, participants do not observe from a self-centered [*sic*] standpoint but reposition themselves in terms of their relationship with others” (p. 37). Anderson’s (2008a) examination of social software networks are examples of the repositioning of individuals in relation to others and for these networks to work effectively there must be elements of *ba* present to affect meaningful participation in the network. Students may not know each other well enough at the start of a course to have a

relationship but these relationships develop as the *ba* develops and this starts with the self. As Nonaka et al (2008) suggest, there is a repositioning based upon the knowledge people have and/or develop of each other.

In this sense *participants* are all who might be part of the learning process, including teachers and students. Garrison, Anderson, and Archer's (2000) Community of Inquiry (COI) model offers much to support *ba* in this respect. In many ways *ba* can be seen to underpin and can be seen to offer another layer or context for the COI model. "The model of this Community of Inquiry assumes that learning occurs within the Community through the interaction of three core elements.... cognitive presence, social presence, and teaching presence" (p. 88).

Cognitive presence... is taken to mean the extent to which the participants in any particular configuration of a community of inquiry are able to construct meaning through sustained communication.... Social presence is defined as the ability of participants in the Community of Inquiry to project their personal characteristics into the community, thereby presenting themselves to the other participants as "real people."... Teaching presence is a means to an end to support and enhance social and cognitive presence for the purpose of realizing educational outcomes. (p. 90)

As Nonaka, Hirata and Toyama (2008) state, "relationships are open minded and empathetic and participants extemporaneously create a space of shared meaning that transcends individual subjectivity" (p. 37). The Community of Inquiry model supports this concept and *ba* acts as the underpinning element within this shared space. To push this further, we need to ask how does the idea of *ba* help create more enriched learning activities and contexts? If we look at the four elements of *ba* in support of the SECI

process as outlined in the first section of this chapter it can be seen that *ba* is a context for social interaction and sharing. Iverson (2011) indicates, “*ba* is a collectively enacted group construct” (p. 48). As a construct, we have to look at all of the elements that go into the construction of an online learning environment in terms of activities, assignments, and the planned interaction of the learners, faculty, and content to see how the physicality of the environment can impact the interaction and the learning. *Ba* may or may not be present depending upon how the environment is built and/or how the faculty interact with the learners, as well as how the learners are supported in their interaction. Being aware of the place that is *ba* is key to the success of these environments. Using the CoI Model as an exemplar for *ba* can support this enrichment. The underlying idea of the CoI model is that the three presences are key to the learning. It can also be shown that *ba* is key to the three presences.

The archive, at the centre of my research, is very much a place at the nexus of a number of concepts and theories. *Ba* is one of the key elements in support of the archive in the sense that for individuals to better appreciate the value of the artefacts there needs to be a social structure to support the sharing of understandings around what may or may not be useful, and how individuals interact with their current peers and peers from previous course iterations who left items behind. The process of the four modes of *ba*, as outlined above, support learner engagement and interaction with the archive and assist in fostering an environment of trust and support with respect to current and future value.

*Ba* is a social process and a mental process whereby we allow ourselves to become one with the environment within which we engage others in the process of creating knowledge. There are many factors that go into building, supporting and



keeping *ba* alive. It can be fragile and easily vanish. It also can be robust and ever-powerfully held together. *Ba* can disappear as a result of distraction, which takes people away from the *ba*, or individuals can leave the *ba* and subsequently return and re-join the *ba*. Learning and knowledge creation does not disappear with the *ba*. Like any distraction, certain elements of the conversation may be lost or misplaced and need to be re-built, as *ba* is re-built

Most of the literature writing about Nishida and the Logic of Basho (Krummel & Nagatomo, 2012; Wargo, 2007), as well as the writings of Shimizu (2009), Nonaka, et al., (2008) and others in the business and management world appear to describe *ba* as a face-to-face construct. Aspects of *ba* being constructed and supported within online learning environments are alluded to by a few (Thomassen & Rive, 2010; Wise & Duffy, 2008); however, this does not appear to be something specifically researched. My research offers evidence of *ba* as a factor in the use and value of the archive and evidence of knowledge being constructed as a result of the *ba* being constructed and maintained in the course.

This section of the literature review has examined how *ba* is created, how *ba* can be integrate into organizations, how *ba* fosters the growth of new knowledge, and how *ba* differs from other forms of community interaction such as communities of practice. *Ba* is a place where learning can occur. That place, however, needs to be facilitated and in doing so there needs to be clarity on the process of knowing. This process starts with an understanding of tacit knowledge. One of the key components of this research project is whether or not aspects of tacit knowledge can be viewed in the archive and if *evidence* of

tacit knowledge is visible, what value are these tacit artefacts to the process of knowledge creation.

### *Tacit Knowledge*

Polanyi (1967, 1974) first developed the concept of tacit knowledge as he struggled to better understand “an alternative ideal of knowledge” (1974, p. vii). His most commonly quoted phrase “we know more than we can tell” (1967 p. 4) opened the door to decades of discussion on the concepts of tacit and explicit knowledge.

Researchers and practitioners alike have examined and re-examined these concepts and, in the process, the term tacit knowledge appears to have taken on a life of its own (Baumard, 2002; Bordum, 2002; Duguid, 2005; Erden, von Krogh, & Nonaka, 2008; Gelwick, 1977; Gourlay, 2002; Gourlay, 2006b; Kreiner, 2002; Leonard & Sensiper, 2002; Nonaka, 1991; Nonaka & Takeuchi, 1995; Nonaka, Toyama, & Hirata, 2008; Nonaka & Toyama, 2007a; Nonaka, von Krogh, & Voelpel, 2006; von Krogh, Ichijo, & Nonaka, 2000; Wise & Duffy, 2008).

Polanyi (1967) “asserted that all knowledge is either tacit or rooted in tacit knowledge, and that no knowledge is completely explicit” (Nonaka, Toyama, & Hirata, 2008, p. 18). One of Polanyi’s (1974) main constructs is the idea of indwelling, which “pertains to the dynamics between explicit knowledge and tacit knowledge. There is an awareness of focus, and a tacit undertow that manifests through the focus” (Brohm, 2005, p.13). As an example of this, Polanyi (1967) talks about the blind man and the probe.

The blind man feels his way by tapping with a stick. Anyone using a probe for the first time will feel its impact against his fingers and palm. But as we learn to use a probe, or to use a stick for feeling our way, our awareness of its impact on our hand is

transformed into a sense of its point touching the objects we are exploring. This is how an interpretive effort transposes meaningless feelings in meaningful ones, and places these at some distance from the original feeling. We become aware of the feelings in our hands in terms of their meaning located at the tip of the probe or stick to which we are attending.... We are attending to the meaning of its impact on our hands in terms of its effect on the things to which we are applying it. (pp. 12-13)

The use of the archive can be seen in a similar way. A number of the students who access artefacts from the archive indicate that by reading and coming to understand what previous learners do and/or experience help them to become more aware and better understand the course, assignments, and what it is that they are attempting to learn. In many ways, artefacts in the archive act like the probe and help to change the learner's level of awareness.

Focal awareness is the explicit component of our understanding or knowledge. On the periphery of this focal awareness is our subsidiary awareness or those less tangible, implicit elements that feed to our understanding of the focal awareness. Polanyi (1967) offers the following, "We may call this the semantic aspect of tacit knowing. All meaning tends to be displaced away from ourselves" (p.13). Polanyi (1974) later outlines:

The arts of doing and knowing, the valuation and the understanding of meanings, are thus seen to be only different aspects of the act of extending our person into the subsidiary awareness of particulars which compose a whole. The inherent structure of this fundamental act of personal knowing makes us both necessarily participate in its

shaping and acknowledge its results with universal intent. This is the prototype of intellectual commitment.

It is the act of commitment in its full structure that saves personal knowledge from being merely subjective. Intellectual commitment is a responsible decision, in submission to the compelling claims of what in good conscience I conceive to be true. It is an act of hope, striving to fulfil an obligation within a personal situation for which I am not responsible and which therefore determines my calling. This hope and this obligation are expressed in the universal intent of personal knowledge. (p. 65)

The implication here is that tacit is seen as subsidiary awareness and we have an obligation to understand this tacit/subsidiary aspect. The focal awareness then represents the explicit dimension. The intellectual commitment is to move the focus from the explicit to the tacit: from the focal awareness to the subsidiary. We want to look at that which guides us. Ultimately it is a matter of getting at the underlying realities in order to better understand the visible aspect: to capture the whole rather than only the de-contextualized facts.

There is both a focal and a subsidiary view of the archive. Many of the learners in this study are guided by and have a very focal perspective. Focal awareness is about the answer. As learners engage in the process of seeking their perceived answers, the process of reading and filtering acts in a subsidiary way and the very act of pushing through the many different artefacts can and should offer tacit support in the use of the archive. Students have context to start with and build context in this process. In time, both meaning and understanding of the artefacts and the archive as a whole evolve. This is the essence of subsidiary awareness.

Our knowledge of the things denoted by words will have been largely acquired by experience... while the words will have acquired their meaning by previously designating such experience.... Therefore, when I receive information by reading a letter and when I ponder the message of the letter, I am subsidiarily aware not only of its text, but also of all the past occasions by which I have come to understand the words of the text, and the whole range of this subsidiary awareness is presented focally in terms of the message. This message or meaning, on which attention is now focussed, is not something tangible: it is the conception evoked by the text. (Polanyi, 1974, p. 92)

What links nicely to the above quotation is the earlier reference to the concept of scaffolding. As Polanyi describes above, we are using a form of scaffolding to better understand meaning. He talks about acquiring knowledge from experience and yet we could not effectively understand or appreciate the knowledge without possessing scaffolds or forms upon which to attach this knowledge. This can suggest that our scaffolds are as innate as is our tacit knowledge and scaffolds could be seen as the structures that hold subsidiary awareness in place. This study seeks to find evidence of the value of these scaffolds and their potential connection to knowledge creation in the hands of the students.

Leonard and Sensiper (2002) state that “[knowledge] is almost completely tacit, that is, semiconscious and unconscious knowledge held in people’s heads and bodies” (p.485). They go on to state that “the most common application of tacit knowledge is problem solving.... A second application... is to the framing of problems.... Finally, the deep study of phenomena seems to provide an understanding... of how something works” (pp. 486-487). Wise and Duffy (2008) indicate that, “in the design of knowledge-

building conversations [they] see the relationship between tacit and explicit components of knowledge... as a central consideration in design” (p. 182). Brown and Duguid (2002) talk about these two dimensions to knowledge and how Polanyi (1967) demonstrated the value of tacit knowledge. No amount of explicit knowledge can make up for what is not present in the form of tacit knowledge (Brown & Duguid, 2002).

Nonaka (1988) incorporates the idea of tacit knowledge as he examines the changing nature of organizations. He indicates that, “knowledge, which often becomes the basis for information creation, is inarticulate knowledge, or what Michael Polanyi has termed tacit knowledge” (p. 68). Nonaka and Takeuchi (1995) expound on the concept of tacit knowledge in relation to the process of knowledge creation. They discuss two dimensions of knowledge creation: one being epistemological and the other ontological.

Nonaka and Takeuchi argue that the ontological dimension recognizes that individuals and not organizations create knowledge and therefore, organizations must support individuals by providing contexts from which individual knowledge is created. The idea of building a dynamic learning archive within a social networked learning environment is an example of organizational support for the creation of a context for knowledge creation. This study seeks to create design principles in support of the use of an archive as outlined in this document and guiding elements for these principles can come as a result of this ontological dimension.

The epistemological dimension focuses on the distinction between tacit and explicit knowledge: “Tacit knowledge is personal, context-specific, and therefore hard to formalize and communicate” (Nonaka & Takeuchi, 1995, p. 59). They go on to state that “sharing tacit knowledge between individuals through communication is an analog

process that requires a kind of “simultaneous processing” of the complexities of issues shared by the individuals” (p. 60). This study supports the epistemological dimension by the very fact of the process of student engagement in and with the archive.

Bordum (2002) suggests that Nonaka and Takeuchi (1995) shift the focus from tacit knowing to tacit knowledge and that Nonaka and Takeuchi incorporate the two constructs into one: a Zen Buddhist approach. The writings of Nishida (1990) affirm this thinking (Graupe, 2008). Bordum spends little time expanding upon the nature of this shift or why he saw it as important. This is a valued insight as it raises the level to which some authors (see, for example, Brohm, 2005) engage Polanyi and his intent with the concept of tacit knowing. The interesting aspect of this Zen Buddhist observation is that whether tacit knowing and tacit knowledge are seen as the same or are separate constructs allows us to better understand the differences and difficulties some writers (Gourlay & Nurse, 2005; Gourlay, 2006a; Glisby & Holden, 2003) have with Nonaka’s concept of knowledge creation. Nishida’s (1990) ideas of reflexive awareness can help further support some of these seemingly disparate ideas. “Rather the self itself is only realized through the act of experiencing. The individual is not an a priori entity but an emergent property of experience itself” (Chia, 2003, p. 968). Nishida’s (1990) ideas about pure experience are seen as “trans-individual rather than a property of individuals” (Chia, 2003, p. 968). The fact that OKCT integrates tacit knowing and tacit knowledge as one construct allow us to better incorporate an existential view into the ideas of knowledge creation. This permits us to view the process of knowledge creation as a seamless interaction of processes that we are an integral part of and therefore knowledge creation is not seen as something external to ourselves.

Reflexive awareness is a key supporting construct of the archive in that by using and being a regular visitor to the archive, students can build and maintain relationships with both the content and the contributors. In so doing, students can regularly engage the archive (the process) as well as potentially acquire sought after answers (the product) and throughout this process, both the student and their understanding of the archive changes and evolves.

Examining the knowledge creation process through engagement with the collective, a group working together sharing common attributes, is also seen as an aspect of context, such as in a course. Erden, von Krogh, and Nonaka (2008) advance the foundation of organizational knowledge creation theory by developing the concept of the “quality of group tacit knowledge (QGTK)” (p. 4). Group tacit knowledge (GTK) is summed up as:

The capacity of a group to act as a collective body using their collective mind in situations that are familiar as well as unfamiliar and complex in the absence of explicit rules or directions. GTK allows the group to deal with uncertainty, to define new tasks and to solve predefined tasks. While doing this, group identity and group boundaries are dynamically reproduced and become key for the recognition of GTK. (p. 9)

The authors go on to state that group tacit knowledge “is an important driver for collective creativity and innovation success in organizations” (p. 14). In a much broader sense, there is a need to begin to translate some of these management and business references into education related terms in part due to their applicability to the world of online learning. Erden, von Krogh, and Nonaka (2008) synthesize constructs of organizational knowledge creation theory into transferrable concepts that can be captured



within the context of online education. These authors conclude their paper in part with a relevant discussion of information technologies (IT) and knowledge creation stating that:

The major challenges in organizational knowledge creation are to define knowledge sources, make them available to the members, and combine the existing ones. Information technologies (IT) may help to overcome these challenges, especially time and space constraints.... IT is known for its capability to facilitate data and information exchange, that is, to combine, organize, and distribute explicit knowledge.... The problem with tacit knowledge is that it is bound to people and, therefore, cannot be externalized along the continuum of knowledge (from tacit to explicit), encoded, or documented easily and sharing it necessitates the “here and now” interaction of people. Thus, some scholars argue that IT can never substitute face-to-face interaction where people can share their tacit as well as their explicit knowledge... We definitely support this argument; nevertheless, we still believe that IT may have a major effect in facilitating tacit knowledge sharing which, as a result, affects the QGTK. IT can serve as a kind of group memory for knowledge, through which people can access past experiences, in particular overt clues, documented experiences, written reflections and so on, and thereby recollect an image of past events. (p. 15)

Interestingly, Shimizu (1995) makes a similar yet possibly dated comment where he states:

In the so-called multimedia society, information is transmitted and exchanged via media, which can carry only the subjective part of representations. No *ba*, the predicative part of the representations, is transmitted by such a [*sic*] media. In such a society, people will stand on their egocentric frames, being separated from their Basho. Consequently, it

will become harder and harder for people to play an improvisational drama at a social level. (p. 76)

The perception in the above quotations appear to be that technology media interaction, such as what is afforded by online education, might stand in the way of effective group tacit knowledge creation as well as the support of any incumbent *ba* or Basho. This is unfortunate, as it appears that these statements come from a place of limited interaction with learning technologies. It is possible that the use of these technologies today affords individuals a greater degree of interaction and interconnectivity and can result in a very powerful learning *ba*. *Ba* is built and managed both from the managerial (teacher) end as well as from those within the *ba* (students and teachers). Garrison, Anderson, and Archer's (2000) "community of inquiry" model very much speaks to aspects of *ba* that are missing in Shimizu's (1995) statement above. Shimizu's work and understanding of *ba* is key in this discussion; however, the CoI model helps to take his discussion and add key elements to bring *ba* to the world of online learning. The idea that teaching presence is "the binding element" (Garrison, Anderson, & Archer, 2000, p. 96) bringing the cognitive and social presence to bear in an online setting is key when examining how *ba* can be built, managed, and used to transform the online environment into a place to facilitate tacit knowledge sharing.

Regardless of the elements of the process of knowledge creation, *ba*, or tacit knowledge there is a point at which stepping back and examining the process itself and one's involvement with the process can benefit. This is an internal/external process and is one where individuals examine their involvement from both an owned internal

perspective (one from being “inside” and one from being “the inside”) as well as one that has the individual examining the process from outside of themselves.

### *Reflective Practice*

Brookfield (2009) states that, “the function of adult educators becomes, to assist [expanding awareness and critical reflection] by helping learner’s reflect critically on their own and other’s assumptions” (p. 125). To effectively use archived discussions and other course generated artefacts and to extract value from the knowledge processes of others, as defined in this research, learners need sufficient skill to effectively “reflect in” and “reflect on” the available archived material. Learners need to be able to know what to do with the material, how to extract what is needed for the creation of their new knowledge, and assimilate the ideas present in the material for their current and/or future knowledge creation needs. Elements of this discussion are present in the first and second chapters.

“The absence of any clear agreement about what reflective practice is and how we recognize it helps us understand why it is not clear how to teach it” (Russell, 2005, p. 200). On the basis of many years of teacher educator experience, Russell (2005) writes extensively on the use of reflection in learning (Munby & Russell, 1992; Munby & Russell, 1993; Munby & Russell, 1994; Russell, 2005). Russell (2005) argues that there is a “gap between the goal of developing critically reflective practitioners and the lack of explicit strategies and support for reaching that goal” (p. 203). Reflective practice has been applied to many different workplace examples (Cox, 2005). It appears most often in the literature of teacher education (Boud, 2001; Killion & Todnem, 1991; King, 2002; Muukkonen & Lakkala, 2009; Regmi, 2009; Smyth, 1989; Terrion & Phillion, 2008;

Thomas, 2008; van Manen, 1995). Not surprisingly, reflective practice as a sustaining process has also found its way into the literature with respect to dissertation research and writing (Johnson-Leslie, 2009).

Donald Schön was the source of many of Russell's (2005) ideas. Schön (1983, 1987) introduced the concept of reflective practice as a tool for professionals to think about their actions while they were performing them. He saw this as a process of continuous learning. Schön adds the concepts of reflection in action: reflecting while doing, and reflection on action: reflection afterwards. He integrates Polanyi's (1967, 1974) concepts of tacit knowledge and the struggle to articulate understandings. Schön (1983) understood that Polanyi's (1974) ideas of personal knowledge were key to the concept of knowing in action. Schön (1983) emphasizes this when he talks about the experience that a practitioner gains through reflection. "Even when (he) makes conscious use of research-based theories and techniques, he is dependent on tacit recognitions, judgements, and skilful performances" (p. 50). "Schön further asserts that we may reflect-in-action somewhat unconsciously" (Terrion & Phillion, 2008, p. 584). Reflection in action is the process of reflecting while doing, but it assumes that the individual has some structural basis or prior understandings upon which they can reflect. Learners accessing the ideas and knowledge processes of others need the ability to reflect in action.

The practitioner allows himself to experience surprise, puzzlement or confusion in a situation, which he finds uncertain or unique. He reflects on the phenomenon before him, and on prior understandings, which have been implicit in his behaviour. He carries out an experiment, which serves to generate both a new

understanding of the phenomenon and a change in the situation. (Schön, 1983, p. 68)

Learners also need the ability to reflect on action, which is primarily an after the fact event. Learners will look back on what they experienced and attempt to make sense of it. “Schön's *reflection-on-action* is the first stage of making sense of an experience after it has occurred [*Italics in original*]” (King, 2002. n. p.). “Schön further argues that reflection-on-learning is facilitated by an ongoing dialogue with a teacher or coach” (Terrion & Phillion, 2008, p. 584). This suggests a guided approach to the reflection as well as some form of a dialogue. Boud (2001) reflects upon Schön's models and states that, “writing is a means of puzzling through what is happening in our work and our personal lives” (p. 11). In this study the writing can be seen from two perspectives: first that which is contained in the archive, written some time in the past as well as current material added or commented on during the existing course; and, second that which is being written in the present partially based upon a reflection of the archived writings. This reflection upon reflection, a multidimensional reflection, may assist in offering the learner a richer opportunity to create new knowledge. “Reflection then, is a process that encompasses all time designations, past, present, and future simultaneously” (Killion & Todnem, 1991, p. 2).

The final assignment for the participants in this study course asks all course participants to write a reflective blog post and in so doing reflect on a variety of questions asked about the course: their engagement with the course, the learning environment, and their interaction with the archive. This course final reflective post, in many ways, nicely mirrors the focus and function of reflective practice as discussed in this literature review.

As is outlined in the results section, these reflective pieces show participants engaged and immersed in their work, as well it shows others reflecting from a distance. Iverson, (2011) discusses Basho and belonging and talks about the Japanese language usage of place. He quotes Haugh (2005), in a summarization where, “the two most important senses of ‘place’ are *tokoro* (location) and *ichi* (one’s position relative to others)” (p. 47). In many ways this parallels Schön's discussion above where he talks about reflecting *on* action and reflecting *in* action and examples of this will be indicated in the results of my research.

Enacting *ba* to enable and support the creation of knowledge within an online learning environment, as has been discussed above, is a key element for learners to become as one with their peers and their environment in support of learning and knowledge creation. *Ba* must be a consciously constructed place and must be a place that is nurtured throughout its existence. In order to assist learners in their engagement within *ba*, conscious reflection must also be embedded into the environment. Reflective practice, used as a tool for professionals to think about their actions while performing them (Russell, 2005), must live alongside the other elements discussed in this literature review and taken as a whole. These elements can be used to foster learning and knowledge creation in online learning environments. Beyond this are the online worlds within which learners engage and support each other.

Our online worlds, particularly those places where we come together to be a part of the learning process, have increasingly become vital to the success of the learning process. It may seem odd to suggest that we are just now beginning to understand the impact of the nature and structure of online learning environments, yet we must not

forget that from a teaching and learning perspective it has been only 20 years since these technology mediated learning environments became an everyday part of our education conversation. The ubiquity of the Internet, the affordances of the Web, and the increased availability and use of mobile platforms are not just changing the way we present and consume education but they are pushing us to re-examine what is necessary to support learning and knowledge creation. In this research project I struggle to understand the impact of the learning environment I find myself working within. My evolving understanding has significantly impacted how I understand my data and make sense of it through this environmental lens. In this next section I plan to explore social software and socially networked learning environments as they are used to support distance education learners.

### *Socially Networked Learning Environments*

When I began this research project I could not imagine the degree by which the online learning environment would have an impact on my study. I did not come to the conversation with a grounded or fixed view of any type of online learning environment, as I generally perceived them as places where learners get together and learning takes place: one virtual classroom was no different from another virtual learning space. I had been swayed by the Clark (1983, 1994a, 1994b) and Kozma (1991, 1994a, 1994b) debate on the influence of media on learning and had been persuaded more by Clark's arguments that media does not influence learning. In so doing I did not initially consider the relevance of the learning medium on my study. When I was offered access to a social-networked learning environment, that became the place of my research study, I happily accepted it without fully appreciating its impact on my research and the even larger

impact that socially networked learning spaces could have upon teaching and learning online. The affordances of socially networked learning spaces are key factors in changing the way we need to view learning environments (Anderson, 2008b). As indicated at the beginning of this document, my personal knowledge creation and learning have been greatly influenced by this project. As a result of this study I have become a passionate believer in the use of social-networked learning spaces in support of online teaching and learning. This should become evident by the end of my dissertation.

Learning management systems (LMS), primarily developed in the 1990s, continue to provide a means to package and deliver online courses to learners. This is the most prevalent form of formal course delivery in online settings today. LMSs are much more than content delivery vehicles yet the very name (Learning Management) implies that the LMS is seen as “primarily a tool set for administrative efficiency rather than a platform for substantive teaching and learning activities” (Mott, 2010, n.p.). Threaded conversations were a significant component of LMS systems from their beginnings and remain key mechanisms for interaction.

The LMS has shaped much of how learners and educators view online learning today “LMS' [*sic*] are designed as a learning management tool, not a learning environment creation tool” (Siemens, 2004, n. p.). Despite this and other comments, Siemens 2004, Mott 2010, and others (Adams, 2010; Lane, 2008, 2009; Sclater, 2008) do not dispute the value of the LMS for certain aspects of the business of online education. It is generally recognized that the LMS was “designed to focus on instructor efficiency for administrative functions such as grade posting, assignment coordination, test creation, and enrollment management” (Lane, 2009, n.p.). The challenge many educators face



today is how to effectively use an LMS in the service of teaching and learning. What holds it back from being an effective learning tool despite its dominance as a vehicle in online learning?

Lamberson and Lamb (2003) outline a number of significant issues with respect to LMSs and, despite the age of their article, much of Lamberson and Lamb's conversation is still relevant today. They outline strengths and weaknesses of these online environments and document issues pertaining to content and portability between platforms and within course iterations. The issues primarily pertain to instructor-provided content. They acknowledge that, "the amount of intellectual capital that is resident in CMS [LMS] sites worldwide is staggering" (p. 59). Lamberson and Lamb go further to acknowledge that learner content or data is not generally extractable from these systems and although they suggest that there is "no technical need" (p. 72) for this data to be exported they acknowledge that, "discussion export should allow a student to retain the context and depth of a discussion by supporting retention of ownership and re-threading" (p. 72). What is missing here is that although students may find ways to access and copy some of their contributions, most LMSs shut off access very shortly after the course finishes and students generally are not able to access (much less augment) this content after the fact. Today, this *staggering* amount of intellectual capital is closed off and packed away such that, in most cases, by using an LMS in the learning process, visible evidence of learning can never be viewed or shared after the fact. None of this takes into consideration any of the issues surrounding copyright challenges and the way that different national legislation or perceived corporate ownership speaks to access rights. Copyright issues will not be discussed in this dissertation but they are very

relevant to the larger conversation around online learning environments. Each course taught using an LMS is a unit, sealed within the time frame of the course and only for those learners who lived with the course and within that timeframe. A result of this closed context and its temporal insecurity is both a perception of privacy and one of imminent termination, that content and discussion created during the course and ending with the final day of class will not serve to enhance, embarrass nor engage learners beyond the course. LMSs serve a valuable purpose in the support of online learning; however, other factors need to be considered beyond the needs of the teacher and of the institution, particularly if one believes that the openness of and to learning should be at the centre of the teaching and learning paradigm.

As with most technologies, the advent and use of one technology can help to push change and introduce the challenge of finding ways to develop new and different opportunities (Christensen, Horn, & Johnson, 2011). Regardless of intent, no one technology offers a panacea for all uses, or even within a particular world of use such as formal education. As outlined above, most LMSs allow the teacher to create a structured environment within a confined space for a specified group of individuals for a defined time period. Changing pedagogical perspectives (Anderson, 2008b; Mott, 2010) and a rethinking of our understanding around Web 2.0 (Dron, 2007, Dron & Anderson, 2011) have pushed learning environment thinking and helped to shape many changes in the use of technologies to support online learning (Dua, 2012; Rose, 2012). The advent of online social networking is an example of technology being used to shape education and cause significant rethinking of what constitutes an appropriate environment for learning. In particular we see how these contexts are used to support networked and connectivist

models of teaching and learning as opposed to group based models that ground learning in LMS systems.

The Australian government's communications and media authority define online social networking as "using web based services to connect and interact with people about shared activities or interests, [and] can be a great way to pursue interests, establish and enhance existing friendships... and share ideas" (Australian Communications and Media Authority, 2011). In popular culture today this definition can take many forms including social web sites such as Facebook, Skype, Twitter, Learnist, LinkedIn, and thousands of others used to connect people around the world and allow them to share common interests, communicate, and develop friendships. The sheer volume of sites makes it very difficult to count or even categorize.

There is an ever-changing list of virtual community sites, each with over 100 million members (List of virtual communities with more than 100 million users, 2012). This list in no way takes into account those that have fewer than 100 million users, but this number alone should provide a sense of the volume and diversity of sites purporting to offer social interaction of varying forms. Rheingold (1993) first coined the term *virtual community* as he explored how individuals interact online in ways similar to face-to-face environments. This connection describes a double-edged sword in that we seek to use technologies to encourage and support our virtual coming together in an attempt to mimic or replicate our face-to-face worlds. We are confronted with the richness afforded by our *onlinedness*, yet this can conflict with the types of learning environments we attempt to replicate. Ideally we should not merely seek to replicate our face-to-face worlds as they currently exist; rather, we need to recognize how to use technologies to

support learning most effectively in online settings. This does not take away from Rheingold's ideas of virtual communities. As such, we must find different ways to support these communities and the learning that occurs within them.

“The freedom to control one's learning experience” (Anderson, 2008b, p. 224) has become a mantra and call to see change in the way online education can be offered. Post-secondary education in particular is becoming a place where there is recognition that students learn best when they have control over their learning environments (Anderson, 2008b; Paulsen, 1993). The LMS world offers a variety of freedoms, but this is primarily done within the clearly defined impermeable walls of the institution where each course is designed to be a single, stand-alone entity with a defined life and access. Further, the LMS has many defined *roles* for administrators, course designers, editors, teachers, tutors, student – listed here in order of power to change and control context. By contrast social networks are much flatter, usually allowing students identical creation and control rights as teachers. Paulsen (1993) quotes Mason and Kyle in their summation of the implications for computer mediated communication (CMC) on distance education. They see the use of CMC offering “the provision of an opportunity, which never existed before, to create a network of scholars, ‘space’ for collective thinking, and access to peers for socializing and serendipitous exchange” (n.p.). Paulsen adds to this by describing his *theory of cooperative freedom*, which he describes as a theory of *autonomy and independence*. Paulsen argued that distance learners needed a balance of cooperation as well as freedom in their learning. His theory included six elements he believed were necessary to support distance learners. These six are: the freedom of time; curriculum; space; access; pace; and medium.

Anderson (2008b) arrived at the following definition of educational social software (ESS) by integrating aspects of Paulsen's theory of cooperative freedom. He defined educational social software as, "*networked tools that support and encourage individuals to learn together while retaining individual control over their time, space, presence, activity, identity, and relationship* [italics in original]" (p. 227). A key part of Anderson's analysis of ESS is his attempt to categorize elements of social software that he believes could be used to support the enhancement of the processes of distance education. In so doing, Anderson concludes this discussion by stating "ESS tools will need to support students working continuously to update content that was initiated months or even years before by other students" (p. 232). This suggests learning environments where all participants have control over their course contributions now and into the future, and they have the ability to grow in their learning beyond the set parameters of any given course. This pushes the temporal boundaries of the learning environment. Social learning environments become permeable both from the perspective of the learner and their contributions, but also from the perspective of past and future peer learners. Social learning environments have the potential to change the learning paradigm; how learners interact with each other, their teachers, and the content, as well as other types of freedoms afforded learners in these environments.

In the context of this research study, content is not just what the teacher brings into the learning space but it also includes any and all contributions made by learners (past and present) as they engage their peers throughout the course. A key part of a networked social learning space is that content can develop a form of permanency as it evolves as a dynamic resource. In my study environment, learners retain complete

control over their content in their course in that they can allow their contributions (content) to be kept for future learners, they can remove it, they can add to it, alter it, or comment on it after the fact: control rests with the learner. The course containing this content is never closed away or shut off after the fact. Courses developed and offered in this social learning space have a life that exists for as long as it is deemed to have value for others. Thus this sense of permanence, made available by a networked social learning space, clearly re-enforces Lamberson and Lamb's (1993) concern, noted above, over "the [staggering] amount of intellectual capital that is resident in... [online] sites" (p. 59) as well as those concerns expressed by Anderson (2008b).

A challenge perceived with a permanent and ever-growing content resource such as an online archive is the belief that it will become too large, unwieldy and unmanageable. In my study environment, aspects of these challenges surface. Dron (2004) addresses some of these issues when he introduces the concept of stigmergy in an online learning environment. Granted, new tools are always being developed that may allow users to filter and categorize their content. Thus content volume challenges may become a moot issue in the future, yet the concept of stigmergy and its place in a networked social learning environment may apply to this study and may offer an insightful dimension.

Stigmergy, a term coined by Grasse (Dron, 2004) is a form of communication "where signs left in the environment later affect the behaviour of others" (n. p.). This type of communication is evident in many of the social software sites used on the Web. It surfaces in various forms including visible markers on sites labeled as *likes* or *number of visits*, and against a peer-scale indicating which articles, resources, or sites others

might choose to visit based upon the patterns of previous visitors. “Stigmergic signals are thus not the result of the intended communication, but are an emergent behavior of the system as a whole” (n. p.) Dron suggests that stigmergy is a form of dialogue and “whatever the original intentions of the individuals, structure in stigmergic systems arises as a direct result of their indirect communication, interactions and behaviour” (n. p.). Understanding the result of this form of dialogue in a networked online learning space is important because it can assist learners as they filter the mass of resources available to them, and it can help to develop a form of a hierarchy in a document archive. I do not perceive stigmergy so much as a tool but more a means of understanding the evolution and the ebb and flow of the access and use of artefacts within an online archive.

Dron and Anderson (2007) define the role of members in a network:

[They] share a marginal sense of commitment to each other, but are typically induced to contribute to the network as a means to increase their personal reputation and to collectively create a resource that has greater value than individual or group contribution and perspective. (p. 2.)

Socially networked learning environments place greater control in the hands of the learner and allow that which is important to rise to the surface and that which may be off-hand, phatic, or “small-talk” to slide away in time. This eventually shapes the corpus of the learning environment as defined by all parties in the learning endeavor. Dron, (2004) quotes both Seely Brown and Siemens. “Systems designed with embedded stigmergic, evolutionary and other self-organizing processes... will necessarily change according to use. They are not fixed systems but are instead learning ecologies” (n. p.).

In a socially networked learning environment the crowd has control over many aspects of their learning and their environment. What needs to be managed, to some degree, is who the crowd is and what they have access to. Dron and Anderson (2011) express this concern as they examine strategies for the use of social software in learning. They conclude in part by stating, “social networking tools, are ubiquitous... and we ignore them at our peril. We need to find ways to take advantage of such systems, not to censor them” (p. 54.). One of the forms this advantage can take is in the use of a product such as Elgg. As previously discussed, Elgg is an open-source, customizable social networking engine. This software environment permits the user to determine the degree by which their contributions can be viewed and/or commented on by others. Within the confines of the university environment within which this study’s instance of Elgg resides, the default setting is set to those users registered within the study university. This includes faculty, staff, and students: both current and former. Users have the ability to open their access to the entire web-sphere or set it to various access levels all the way to being as narrow and private as restricted to personal viewing by the creator. The crowd can, to a degree, be managed and the environment, although walled, should permit for safe but permeable access in support of learning, knowledge creation, and growth. Importantly, these permissions are not set at the tool level (for example all blog posts are visible only by members of a class group), but rather the individual selects the permissions for each posting. Thus, a post may be restricted to a few friends while the next could be open to the whole web including search engines. Finally, the creator, whenever desired, may change these permission levels.



As we are challenged to use different environments, the challenges serve to change us. It is these changes and how we evolve and become different and more effective learners through our use and engagement with these environments and related tools that I wish to discuss next.

### *Efficacy*

Efficacy, also described by Patterson and Kelleher (2005) as self-efficacy or personal-efficacy, is the concept of “beliefs about your capability to accomplish challenging goals” (p. 76). Maddux (2002) suggests “when people can actually see themselves coping effectively with difficult situations, their sense of mastery is likely to be heightened” (p. 282). Efficacy is about belief in oneself based upon the impact and effect of interactions with others and with elements of one’s environment. “Self-efficacy is concerned with human potential and possibilities, not limitations” (Maddux 2002, p. 285). The terms efficacy, self-efficacy, and personal-efficacy may not necessarily be seen from the same standpoint as in having a sense of efficacy about one’s peers, yet at the same time not having self-efficacy. In this sense I will generally speak about efficacy in its root sense but I may at times add a descriptive prefix depending upon the point I may be trying to make.

Only after analysing my data did I begin to realize the impact of the archive and related impact of the learning environment upon student efficacy. There is a question about “net efficacy” as part of the final reflection assignment in the course. I realize that the issue of efficacy is not just being demonstrated by answers to this specific question, but throughout the entire breadth of the data there are many instances of students talking out issues that clearly show evidence of (or lack of) efficacy in their learning of the

course material, becoming comfortable with the learning environment, and with the archive. “The development of efficacy is a dynamic process, the result of interaction between the self and the environment” (Patterson & Kelleher, 2005, p. 78).

Student willingness to engage with content, with peers, and with the teacher in most academic settings often comes from an intrinsic place. The strength of this internal willingness can be impacted by the nature of learning environments, which can include external expectations and other course requirements. Environmental factors can have an impact on the amount and quality of this engagement. Social cognitive theory suggests that self-efficacy as well as an understanding about personal outcomes and the outcomes of the immediate community influence student participation and engagement (Bandura, 1977a, 1977b; 2001; Schunk & Usher, 2012; Zhuo, 2011). The impact of the instruction process as well as the social process embedded within a course also impacts the efficacy of the learner (Schunk & Usher, 2012). This is not just a case of awareness but also about the impact of one’s environment and a willingness to continue to engage, knowing that there are positive benefits to this engagement process. In many ways this is a case of belief begetting belief. It is a case of believing that you can accomplish what you want to accomplish (Maddux, 2002). In the case of my study it is students seeing the positive impact of their socially networked environment and the archive, and how they are influenced by this positive environmental reinforcement.

“Unless people believe they can produce desired results and forestall detrimental ones by their actions, they have little incentive to act or to persevere in the face of difficulties” (Bandura, 2001, p. 10). The archive and the socially networked learning environment appear to directly influence student persistence and willingness to push past

difficulties and achieve relative success. Having the ability to share and compare one's efforts against the efforts of peers in the archive allows students to "judge the correctness of their predictive and operative thinking against the outcomes of their actions, the effects that other people's actions produce, what others believe, deductions from established knowledge and what necessarily follows from it" (p. 10).

Efficacy also relates to the previously discussed domain of self-reflection. Bandura (2001) speaks of people as agents and "to be an agent is to intentionally make things happen by one's actions" (p. 2). He goes on to suggest "people are not only agents of action but self-examiners of their own functioning. The metacognitive capability to reflect upon oneself and the adequacy of one's thoughts and actions is another distinctly core human feature of agency" (p. 10). This linking of self-reflection and efficacy is an important aspect of my study as students find various ways to tie together their understanding of the content and their use of the learning environment and related tools in the process of changing their beliefs as they accomplish challenging goals. As mentioned earlier, this is very much a process of belief begetting belief. As one's efficacy is increased one's ability to reflect positively upon one's learning increases, and perceived barriers appear to diminish.

Krämer and Winter (2008) examine impression management in social network sites and show that self-efficacy is strongly related to the types of relationships users maintain and the degree by which they are willing to put themselves into their virtual spaces. This online impression management study appears to suggest that the degree by which a user is willing to successfully *self-present* in this very public environment is directly related to their sense of self-efficacy. This desire to appear competent has

implications for my study, as there appears to be a direct link between student efficacy and their overall engagement with the course and the archive.

Shunk and Usher (2012) outline four sources of self-efficacy. These are: mastery experiences (interpretations of actual performances); vicarious (modelled) experiences; forms of social persuasion; and psychological indexes (p. 21). Mastery experiences deal with how one interprets one's performance and not the result of their performance itself; therefore, regardless of the result, it is the value attached to how the individual chooses to see the result that ultimately matters. Social comparisons and observing the work of one's peers impact efficacy in that comparisons become a benchmark against which success can be measured. These vicarious experiences can either positively or negatively influence efficacy. Vicarious modelling can also be enacted through teaching efforts and practice, and modelling based upon these various sources can have a lasting effect on one's sense of efficacy. Social persuasion, as in the message we hear as we work or learn, can also have a positive or negative effect on our efficacy. The "source credibility, valence of the message and frequency" (p. 21) are key factors in how we interpret the message and the value we attach to it. Lastly, the psychological factor that impacts our efficacy is the degree by which emotional issues impact our perception of success and/or failure. Stress, anxiety, and fear influence our efficacy and depending upon the circumstance, these factors can have positive or negative impacts. It is understood that we all interpret events in our lives quite differently. These interpretations may have significant or less significant impact on our sense of efficacy. Having the ability to observe reactions and responses to situations through a similar source list as noted above can help to frame learning environments that support positive efficacy.

A final note on efficacy is actually something that touches a much larger issue and one that this study really only skirts. This is more specifically alluded to in the final reflection questions in this study course and that is “net efficacy.” I am not completely sure that the study participants focus on the “net” part of the reflection. Despite this apparent lack of focus, the whole issue around Internet, network, and Web efficacy is a very significant issue for the future of education and online education in particular. A larger conversation around the “digital divide”, which was originally spoken of in the 1990s (Selwyn, 2004), needs to be re-examined in terms of the ever-changing face of our use of technology in education (Eastin & LaRose, 2000). The *digital divide* conversation was originally about the have’s and have-not’s of information and communication technologies (ICT). Today it has become less about the availability of these technologies and more about the effective use of these ICTs; in other words, how users understand the tools available to them and understand them in terms of their online identity and their overall net-efficacy (Goode, 2010; Hvorecký, 2004). Rheingold (2012) examines what he refers to as the issue of “Net Smart” and in doing so he discusses “five literacies that are in the process of changing our world: attention, participation, collaboration, the critical consumption of information, and network smarts” (p. 5). He looks at the implications of us as a society if we are not capable of “handling the new flows of knowledge, media and, attention” (p. 5). Much of this speaks to today’s learner and their ability to not only use tools such as the custom Elgg but to understand and effectively use other social networking tools such as Facebook and LinkedIn, to name only two. The issue of net-efficacy, net-smarts, and possibly a net-divide need much more study. These issues are all interconnected within the results of my research.

The literature on efficacy clearly brings in issues of self-reflection and environmental issues impacting learning. This literature review attempts to bring together inter-related domains and illustrate, from the literature, their relationship to this research study. These six literature domains show evidence of these linkages and connections.

### **Chapter Summary**

The earlier theoretical introduction in Chapters 1 and 2 helps to frame this literature review, which begins by examining the process of knowledge creation as well as an overview of the concept of knowledge. An enabling condition for knowledge creation, the concept of *ba*, is introduced which demonstrates the context around which knowledge creation takes place. The literature then explores the nature of tacit knowledge and its potential impact on learning, learning environments, and this study in particular. Next, this review examines reflective practice as a tool to assist learners in their process of engaging the class archive and examining their learning as a result of this interaction. Socially networked learning environments examines existing online practice with respect to virtual learning environments, using learning or content management systems, and outlines both their value and ways that learning moves beyond their intended and primary uses. This domain looks at ways that social software can support learners, and how different tool sets can be structured to support a broad range of learning activities in support of more permanent use and access of learning artefacts. Ultimately, this domain is used to demonstrate the value of networked social learning spaces as places where learners gain and maintain their control over their learning experiences. The final literature domain, efficacy, examines student beliefs about their ability to be

successful in their learning and how these beliefs foster various aspects of their course, including the use of the course archive. This self-efficacy or personal-efficacy becomes a key part of the student experience. Our understanding what can be or needs to be done to support this in socially networked learning spaces is a vital piece of the knowledge creation equation. The next chapter moves to the research component of this dissertation and begins with a discussion on the theoretical paradigm that underpins the research methodology, and moves to an overview of the structure and design of the research model.

## Chapter Five: METHODOLOGY

### Chapter Overview

This chapter outlines the theoretical paradigm and epistemological approach that underpins my research model, my research methodology, its structure and design, and the environment within which the study takes place. This chapter also includes a discussion about the researcher as a participant in the research as well as a description of the design intervention in terms of the two course iterations of the study, issues regarding ethics, my data collection, analysis, and coding process, and lastly a chapter summary.

“An essential feature of educational design research is the development of solutions to problems of practice.... These interventions, inputs into educational environments that are fine-tuned through empirical testing, constitute the main practical contribution of educational design research. This is because they are designed for actual use. The interventions created through educational design research are not merely hypothetical concepts; they are implemented in authentic settings with the goal of solving real problems.... Design research also yields theoretical understanding. That is, understanding about the phenomenon in question that is abstracted from empirical findings, and contributes to a body of knowledge that is useful to others outside the research setting.” (McKenney & Reeves, 2012, p. 21)

The initial portion of this chapter outlines the linking together of different theoretical sources into one cohesive model. This is a qualitative study that examines the potential value for learners of a dynamic archive containing contributions from previous students. Another aspect of this study that presents a challenge is that I chose a research



design with an inherent pragmatic paradigm, yet much of my study is determined by a more constructivist approach.

### **Research Paradigm**

Cohen, Manion, and Morrison (2008) suggest, “research design is governed by the notion of ‘fitness for purpose’” (p. 78), and the research purpose ideally determines the methodology and design. The purpose of my research is to examine the potential use and value of an online archive in order to answer the research questions and to produce design principles in support of the integration and use of such an archive embedded within online learning environments. These design principles come about as a result of the knowledge gleaned from my study and will offer value to others beyond the scope of this research.

My research approach is primarily constructivist/interpretivist. Aspects of my approach may suggest elements of a post-positivist, or even a pragmatic paradigm. I suggest post-positivist from the perspective of having an underlying initial theory (organizational knowledge creation theory) and the pragmatic paradigm is embedded in my design-based methodology, which is reflected in a practical focus on the research problem or question (Mackenzie & Knipe, 2006). My primary goal is to gain an understanding of the possible use and value of the archive, through the words of my research participants, while my role in the research project is as an active participant in this process. The constructivist or interpretative frame is noted by stress on understanding the voice of the student research participants in this study that help shape the product of the future and it is these conversations that support and give credibility to the design principles. Thus the ontological perspective assumes that the reality of my

research world is subjective and constructed as a result of the daily interactions of research participants and through their meanings and understandings, a picture of a more ideal learning environment can begin to surface. This perspective is also supported by OKCT, particularly looking through the SECI model lens of knowledge creation and how *ba* shapes the reality of those involved in the process of knowledge creation.

Guba and Lincoln (2005), and others (Cohen et al., 2008; Creswell, 2007), offer different paradigmatic perspectives; however, there is an underlying conversation suggesting that these silo-like paradigm approaches are not neat and tidy; rather, there is much overlap. Guba and Lincoln (2005) suggest it is better we “probe where and how paradigms exhibit confluence and where and how they exhibit differences, controversies, and contradictions” (p. 192). My research study has elements of different paradigms. My core belief-set is one of social construction. This view colours the entire process of my research.

### **Research Epistemology**

My epistemological perspective is also shaped by my belief that the use and value of an archive in an online learning environment is very much determined by “individual and collective reconstructions” (p. 196). This perspective is in addition to my shared interpretation and understanding as the researcher not being separated from those being studied. This is supported by the work of Nonaka et al., (2008) in their various study examples where researchers joined in with their environments in order to fully appreciate and be one with that which was being studied. Additionally, this relationship (between the researcher and others involved; including in my case the teacher) can be seen through the work of Lincoln and Guba (1986) where:

The relationship [between inquirer-respondent] is one of mutual and simultaneous influence. The interactive nature of the relationship is prized, since it is only because of this feature that inquirers and respondents may fruitfully learn together. The relationship between researcher and respondent, when properly established, is one of respectful negotiation, joint control, and reciprocal learning. (p. 17)

This participant-researcher role is also outlined in design-based models. It is understood that “distinctions among designers, researchers, and participants are blurred” (Wang & Hannafin, 2005, p. 9). The relationship between the researcher and the research participants as well as the researcher as a participant requires; “cultivation of ongoing relationships with practitioners... [and] because of the reciprocal emphasis on learning and the means that support it, design researchers seek to develop a deep understanding of the ecology of learning” (Cobb, Confrey, diSessa, Lehrer, & Schauble, 2003, p. 12). These authors outline their learning ecology to mean: “a complex interacting system involving multiple elements of different types and levels” (p. 9). This system includes an understanding that the researcher is as much a participant as they are the researcher.

Unlike research based on a positivist paradigm (and to lesser degree that based in an interpretative or constructionist paradigm in which the researcher strives to distance them self from the participants in order to gain a distinct and attempted objective view), in design based and action research designs, the researcher attempts to experience, shape, and engage fully as both a participant and a researcher. Although I see the world in a very socially constructed way, it as a result of these social constructions that we help

shape and ultimately frame new designs and begin to develop new design principles, and thus the design-based approach is ideally suited for my study.

### **Methodology Background**

My interest in building value from the processes of past learning and the conversations supporting this learning for current and future purposes came to light while pursuing my Master's degree. My Master's research looked at the concept of capturing knowledge creation processes in online environments through the building of a community memory (Berry, 2003). The core ideas in this thesis are still sound; however, a key missing piece in this earlier Master's conversation was the establishment of a means for bringing the ideas from my Master's research to life and demonstrating its value in a current learning environment. Much has changed technologically in the ten years since I examined these concepts. Our understanding of the impact of online learning environments on the learning process has evolved significantly. Much can be learned from the processes and ideas of those who have gone before. By integrating these ideas and this rich past into an online environment we have an opportunity to rethink online learning in support of new ways of creating knowledge. This research project seeks to show the value of making available an archive of idea artefacts and different ways of thinking, and how current learners can use these artefacts in their learning processes.

In the early stages of this project I attempt to find ways for my research ideas to be fashioned into a suitable project. As a result of conversations with my supervisor and others and as outlined earlier, I understand that a social-networked learning environment is an essential element in this project. Such an open social-networked learning

environment provides moveable and permeable boundaries to accommodate the idea flows of learners and their learning using an archive. In particular there needs to be long-term, multi-semester access to course artefacts where students have control over their audience, have access to prior iterations of the course and where course participants are permitted to participate in current and subsequent course iterations. Ongoing access and use of an archive, as intended by this project, needs an environment that is open and flexible in this manner. As outlined earlier in this document, more commonly used and accepted LMSs, in use by many learning organizations today, do not offer this degree of openness and flexibility. LMS environments “offer opportunities for organization, efficiency, and security.... Nevertheless, researchers have argued that these platforms have generally been used as static repositories of content, failing to provide the robust social experience found on platforms that have garnered societal interest and appeal” (Veletsianos & Navarrete, 2012, p. 145). Use of an LMS environment alone would have been a significant challenge for my research study.

### **Design-Based Methodology**

A fundamental aspect of design-based research is that the researcher is an active member and participant in the context of the research study. In a similar way to ethnography, the researcher gathers data within the research environment during the life of the project. Unlike ethnography, the DBR researcher has a goal not just to understand and to describe the data, but to also produce design principles that could be useful to practitioners working in related environments.

Additionally I need to be allowed to make possible design changes to the research environment when and/or where necessary in order to demonstrate my hypothesis. For

example, if something in the original design for this study is not working and needs altering then changes can and will be made. I was offered the opportunity to work with an existing Masters' level course being offered at the university using a custom instance of Elgg. The Elgg environment is a customizable, open source social-networking engine and, in its customized state it is:

Owned by its inhabitants: anyone and everyone who is logged in can blog, create wikis, share files, podcast, share bookmarks, create groups, engage in discussion [*sic*] and much more. It is about controllable privacy: For practically everything you create, you decide exactly who can access it - how much or how little you reveal is up to you. [And] it is about trust: Because everyone has a verified identity, you can be sure that people are who they say they are and are accountable for what they say and do. (Landing: About, accessed August 20, 2012, n. p.)

The key parts of the above description that make Elgg an ideal environment for this study are that the environment is *owned by its inhabitants*, it has *controllable privacy*, and each participant has a *verifiable identity*. This custom Elgg instance is an editable and configurable environment with controlled yet permeable spaces where learners can interact with each other in their specific course while at the same time know that their course contributions have a life or permanence beyond the strict time parameters of the course. This Elgg instance also offers learners access to a broader social learning environment permitting both me as the researcher and other invited individuals into various spaces at different times in support of the learning process.

The core idea for my research comes from my attempt to understand if it is possible to enhance learning opportunities by offering access to an archive of learning artefacts in online courses. I want to understand if, how, and to what benefit learners use and create persistent artefacts. In this online learning context, artefacts range from asynchronous discussions, blog posts, synchronous meetings, and other recorded interactions to assignments (with or without teacher marks and comments) or draft documents that learners leave behind as they work through their learning and their construction of knowledge within any given online course. In the custom Elgg environment there are a variety of very different vehicles for communication and the words *forum* or *discussion post* tend to have a more fixed LMS focus. I want the reader to see that participants have a variety of means to communicate and carry on conversations. Additionally I recognize the value and potential for relics to remain as a result of these online conversations (Oakeshott, 1998).

In the initial stages of building this research project, I did not fully appreciate what kind of a learning environment was needed to support my ideas. It was not until I had spent time with the learners in the course, and as an active participant in other online courses that it became clear that I needed to be an integral part of the research process and to actively participate in the design and the creation of the course. Without day-to-day involvement it would have been a great challenge to understand and appreciate the nature of the learners' experience with the artefacts contained within the archive. I not only wanted to observe learner interactions but I wanted to be able to talk to the learners as they participated in the course and as they interact with each other, the instructor, and the artefacts left behind by their peers and previous course participants. I understood that

by observing and listening to the day-to-day conversations as well as reaching out and talking to the learners during the course I had a better opportunity to appreciate the real value of such an archive on the learning process. Being an active researcher/course member is essential to my research.

Arriving at a design-based research methodology came out of an understanding of what was needed both from me as the researcher and from the environment within which this research study takes place. My constructivist understanding frames my view of how I engage others and what I expect from others as research participants. My understanding of DBR evolved throughout this study and although when I entered the project I had a fairly rigid and somewhat narrow view of the methodology, my knowledge of the processes evolved and the impact of this changed-view transformed what I saw and how I interpreted my data.

### **Structure of the Research Design**

“Design-based research is not so much an approach, as it is a series of approaches, with the intent of producing new theories, artefacts, and practices that account for and potentially impact learning and teaching in naturalistic settings” (Barab & Squire, 2004, p. 2). Barab and Squire go on to state that:

Design-based research is concerned with using design in the service of using broad models of how humans think, know, act, and learn; that is, a critical component of the design-based research is that the design is conceived not just to meet local needs, but to advance a theoretical agenda, to uncover, explore, and confirm theoretical relationships.... *Design-based research requires more than simply showing a particular design works but demands that the researcher...*



*generate evidence-based claims about learning that address contemporary theoretical issues and further the theoretical knowledge of the field* [italics in original]. (pp. 5-6)

Herrington, et al., (2007) discuss the use of design-based research in doctoral studies:

At first glance, the requirement that design-based research should address complex problems in real contexts in close collaboration with practitioners may appear to be such a long-term and intensive approach to educational inquiry that doctoral students... should not attempt to adopt this approach for their doctoral dissertations. But we argue that design-based research is not only feasible for doctoral students, but that stronger students should be encouraged to engage in it by their academic advisors. (p. 4090)

The multiple stages of design-based research (Anderson, 2005; Bannan-Ritland, 2003) in many ways replicate the cyclical nature of the knowledge creation model introduced in the first three chapters; as the DBR stages allow for growth and circle back to a base of ever-evolving knowledge creation and understanding. The first stage of design-based research is informed exploration which focuses on a literature review, development of the theory, “expert interviews, and assessment of interventions in comparable educational contexts” (Anderson, 2005, p. 5). The second stage, enactment, “seeks to document production decisions, processes, barriers and costs” (p. 6). The third stage is evaluation within a local context. This entails the creation of evaluative instruments “to describe, monitor and assess both the intended and the unintended consequences of the intervention” (p. 6). The final stage, the broader impact evaluation,

seeks to develop “larger generalization of the effect of the intervention as well as knowledge about the ways and means by which specific characteristics of each unique educational context effect upon the efficacy of the intervention” (p. 6). This is an iterative process and, in my study, learners repeat this iterative process as they access and use the content of the course archive.

Anderson (2005) further describes the iterative nature of design-based research and the fact that within each of the four stages there is room for multiple iterations. The encouraging part about these iterations is that “we are more knowledgeable than at the entry point for the previous stage. Thus knowledge grows in a circular fashion as it iterates through phases” (p. 7). The iterative process of the knowledge creation cycle supports knowledge growth. As the cycles expands outward in a spiral fashion one’s knowledge evolves and the nature of one’s knowledge changes such that the knowing process evolves along with it.

Anderson (2005) posits further that design-based research arose largely within an American-based context grounded in the philosophical works of William James and John Dewey. James heavily influenced Nishida’s work. The concepts of Basho or *Ba* became an extension of Nishida’s Buddhist philosophical tradition tied to his understandings of the western philosophical tradition. This methodology is most suited to the nature of this research due, in part, to the threading of a philosophical context within the learning environment. Bannan-Ritland (2003) proposes “an integrative learning design (ILD) framework... that attempts to provide a comprehensive, yet flexible, guiding framework that positions design research as a socially constructed, contextualized process for

producing educationally effective interventions with a high likelihood of being used in practice” (p. 21).

Brown (1992) and Collins’ (1990) describe design-based research as a methodology that focuses on complex problems in real-world situations in partnership with those engaged in these same activities. This includes bringing together both known and hypothetical design principles using applicable technologies in support of acceptable solutions. They also outline that any inquiry needs to be reflective and rigorous while ensuring that the end product allowed for new design principles in support of innovative learning environments. Ultimately, what distinguishes this methodology from other forms of research is that there is a “*commitment to developing theoretical insights and practical solutions simultaneously, in real world contexts, together with stakeholders* [italics in original]” (McKenney & Reeves, 2012, p. 9).

Online discussions (primarily asynchronous) are used extensively in computer-mediated instruction. Most of these discussions focus on addressing something tangible such as an assignment or resolving a course-related issue. There may be off-topic, side discussions embedded within the main topic area but most online conversation is guided and focused, aiming towards an explicit learning product. The learning, the measurement of this learning and the product or products resulting from this learning becomes the accomplishments and the goal of the course. What is generally not considered or, at least not preserved, are the side elements in these discussions: the scaffolds or supports used to arrive at the learning products. These discarded tacit insights are considered to have served their purpose and are no longer needed. This research examines the potential value in these subsidiary elements and tacit insights. One of the purposes of this research

is to determine whether there is any evidence of value in these seemingly discarded insights and how environments might be structured in the future to support these elements if they could be seen to be of value.

Embedded into this course there is a place for learners to talk through their own learning processes and, in this talking process, leave for others a record of their learning and cognitive struggles. This is the archive. Learners leave behind scaffold frames and used tacit insights (footprints) upon which their understandings are built. A blog structured into the course proved to be an effective medium for individuals to articulate their struggles and their participation in the course. The blog became an archive containing these tacit scaffolds. The beneficial part of using a blog or an online discussion group to capture tacit exchanges is that a more permanent record is maintained. Individuals have the ability to return and reread what has been said and reflect upon the thoughts of others in the process of attempting to understand. A record of the struggles of prior learners is an important aspect of tacit knowing. The value of a design-based research model that encourages iterative examination of the research process allows the researcher to decide if a blog or other forms of preserved communication are effective instruments for capturing tacit interactions, or whether other collaborative tools might be more effective.

Barab and Squire (2004) state:

Design-based research requires more than simply showing a particular design works but demands that the researcher (move beyond a particular design exemplar to) generate evidence-based claims about learning that address contemporary

theoretical issues and further the theoretical knowledge of the field [*italics in original*]. (pp. 5-6)

Data from this research project provides such evidence and builds upon other theories to support the increased use of social-networked learning environments, as well as provide appropriate structural elements in support of the use of learning archives within these environments.

Bereiter (2002) discusses four distinct characteristics of design-based research and concludes by stating, “design research is guided by some vision of as-yet-unrealized possibilities and is characterized by emergent goals – that is, goals that arise and evolve in the course of cycles of design and research” (p. 325). This research project is based upon a vision and a belief that an understanding of the process of knowing through the sharing of tacit knowledge may yet become an integral part of online learning environments in such a way as to offer current learners access to the how and why processes of prior learners thus expanding the cycle of knowledge creation. The results of this project, as discussed in the following chapter, demonstrate this vision.

My research project is designed with me, the researcher, being an active participant in two subsequent iterations of an online Masters’ level course where the learners, as part of their day-to-day course activities are expected to make use of archived online synchronous and asynchronous discussions as a means of accessing the knowledge processes of prior learners. The learning environment is a social-networked space using a customized version of open-source software, Elgg. The course, including the course outline, all the course materials, the assignments, the schedule, and all other materials related to the course are located within the university’s LMS. The virtual classroom is

within the Elgg environment and it is here that students pose questions, exchange ideas, and talk through issues and concerns both pertaining to the course and beyond.

### **Research Environment**

This social networking environment offers a variety of tools including: group files; a wiki; links; blogging; forums; as well as a place for e-portfolios. All of these tools permit archiving. This social learning environment offers learners the opportunity to build a network of friends and communities, and within these communities, learners retain personal control over who has access to their postings so that more closely focussed discussions can take place within closed communities if needed. Individuals are able to edit their profile to permit as much or as little external access to their space as desired. There are examples of individuals who built a blog as a personal learning journal and permitted no others to access their entries. Learners can also, after the fact, edit or delete their contributions. One individual, who agreed to be a part of the research study, chose to delete all of their contributions and remove their profile at the end of the course. Although this may appear to be an extreme example, it clearly demonstrates the power of the user in a socially networked learning environment. From a learning and knowledge creation perspective, this tool-set, the Elgg environment offers a rich opportunity to share understandings and engage others in a safe and supportive environment.

This online social space is somewhat different than the discussion forum space set out in most LMSs. In an LMS, one does not have the ability to share comments with a broader audience beyond the course and, in most cases; the content of the LMS disappears at the conclusion of the course. Further, typically only the teacher can start (or

close) a new discussion, or group whereas in the Elgg environment these capabilities are available to everyone. Discussion threads in an LMS have become fairly sophisticated, although similar tools have been integrated into the Elgg environment. Blogs, not generally a part of most LMSs, are, “website[s] with dated entries, presented in reverse chronological order and published on the Internet” (Duffy & Bruns, 2006, p. 32). In the context of this discussion, blogs, in an academic setting, allow the author an opportunity to discuss a variety of topics and to elicit comments and side discussions beyond the purview of any set focus. In most course LMS environments there is a more guided focus and a design structure to maintain direction. This is not to suggest that one tool is better or worse than the other but as with many aspects of online learning, finding and using the most appropriate tool is key to a successful learning experience.

Regardless of the tool or environment, ICTs are evolving both at an exponential rate and in ways that, even today, some find difficulty imagining. Tools that are being used today in social and entertainment settings are also being integrated into online teaching and learning environments. These tools and technologies allow students and teachers to create artefacts that can be stored within online archives. We are only beginning to understand the nature and value of artefacts contained within these archives.

Paavola and Hakkarainen (2009) discuss the use of artefacts to support knowledge creation in Computer-Supported Collaborative Learning (CSCL). They attempt to move the knowledge creation metaphor towards a different view where they introduce a concept referred to as *trialogues*. Dialogues are “those processes where things are developed collaboratively.... The emphasis is on developing something new collaboratively, not repeating existing knowledge” (p. 84). Paavola and Hakkarainen

acknowledge the work of Nonaka and Takeuchi (1995), Bereiter (2002), and others. They integrate knowledge artefacts into a shared understanding of the learning process.

Murray and Sandars (2009) also discuss the use of student created artefacts in a medical context and emphasize the value of these artefacts (e-portfolios) in the reflective practice of junior doctors. Nelkner, Magenheim, and Reinhardt (2009) examine the nature of personal learning environments and state, “artefacts and social interactions are observable externalisations of knowledge” (p. 379). They built a model of knowledge emergence demonstrating the use and value of artefacts in the learning process. Nelkner, et al., (2009), as with Paavola and Hakkarainen (2009), built a triangular model, which includes artefacts and what they refer to as sociofacts or social interactions and cognifacts or “personal expertise as a result of formal and informal learning and communication processes” (Nelkner, Magenheim, & Reinhardt, 2009, p. 380). The use of archived materials (artefacts) is linked to the knowledge creation process and this research study brings new light to this emerging concept.

### **Description of the Intervention**

Students and especially adult students with jobs and families are busy; they have a limited amount of time and most engage course content and each other to the extent that they need to in order to accomplish an assignment and/or complete elements of any given course. From my personal online experience, no matter how intrinsically valuable archived materials might be; most students will infrequently wander through the past history of a course (a course archive) unless specifically directed to. This is not necessarily due to the archive being perceived as having limited value but more about time management and a perceived sense of where one best spends one’s limited time and



resources. This issue becomes a key challenge when building the intervention for this study and is discussed at length in the results chapter.

By the summer of 2010 the class archive for the learning environment being studied contained content in the form of blog postings, a few student-generated files, and class discussions held within a closed Elgg classroom space of two earlier but sequential sections of the course used in this study. The two iterations of this study follow immediately after these two earlier course sections. This original Elgg environment was at that time generally unsophisticated and was in its earliest stages of development within the university. The search feature was limited and navigation was a challenge in part due to the language used to describe the various locations and intentions of the space and in particular the language and intent was quite different from the more familiar LMS students had previously worked within. There were few additional features to assist users to navigate the system.

This course original archive (available to students at the start of the research) offers both challenges and concerns for the study participants. Within these environmental concerns one of the many perceived challenges is getting students to see the value of the archive and encouraging students to take time to read through or search the archive for thoughts and ideas that might aid their understanding of the course material. Another concern is that although the students who had already contributed to the archive prior to the research appeared to understand why they were contributing, many did not tag or properly identify their contributions for future use. The archive is content rich but finding useful artefacts is difficult as a result of this challenging toolset.

The plan to use a course archive within an active course is also considered a challenge because using an archive is not seen as a task that is normally a part of most post-secondary environments and students are generally not acculturated to such practice. An additional challenge not discussed or perceived of at this design phase is the various issues that surface in offering this course outside of the traditional LMS environment and offering it from within an online socially networked learning space (for example the desirability, but complications of using a single logon to gain access to the LMS, the library, and the Elgg environment). These issues have been discussed earlier in this document and in the early design stage of this study much was unknown. Keeping most of these issues in mind, the course professor and I designed a reflective assignment ([Appendix C](#)) to support learners in seeing value in their use of the archive. In addition, it is planned that I, as an active participant in the course, will attempt to provide support for the learners as they work with the archive and attempt to help them to see value in using the archive for their various assignments. My role in the course is a combination of observer, participant, and course environment assistant. I play no role in any of the assignments. I read the various discussions and comments and actively engage the learners when there are issues and challenges regarding the archive or the Elgg environment. I attempt to provide an understanding regarding the structure of the virtual space and clarify navigation and access issues. I participate in broader conversations regarding a philosophical perspective on the use of social-networked learning spaces versus LMS and other forms of learning environments. I offer synchronous sessions, where needed, to support the learners in their early steps in this new social environment and to better understand the archive and how to use it effectively. In this way learners are

encouraged to find archived samples of similar work to assist them with this main course assignment.

At the start of the course students are informed that their blog postings within the online classroom will be kept and made available for subsequent course participants. The students are shown how to use the privacy settings within the online software to ensure that each student has control over access to their contributions. They are granted complete rights to their contributions in terms of what each will permit to be left behind in the archive or what they wish to have removed beyond their current course. Each contribution names the contributor and for purposes of this research project, each student either signs an informed consent document permitting use of their information or they do not. Regardless of whether a student signs such a document they all can keep or remove their content as and when they choose within the confines of the course. They are encouraged to freely communicate within the course plus ask questions of the instructor, me as the researcher, or each other. As noted earlier, the Elgg environment permits users to determine their privacy settings. In most online learning environments, students generally understand that there is an expectation that their discussion entries will be shared inside the classroom in a semi-public manner such that their current course peers might read and comment on their work. My use of the term *semi-public* infers that students within their class will have access to peer online contributions but unless specifically granted by the contributor, no one outside of the class will have access to what is being stated. Discussions and postings as well as research papers and other resources, if placed online, are made available for peer groups to read, reflect upon, and critique. In this study both active research participants (those who sign a consent

document) and those not participating in the research study are informed that their contributions might be read and examined by students currently enrolled, those from up to two iterations prior to the start of the study, and those for the two iterations of the study. Students are given complete control over their privacy settings and some choose to use privacy settings to inhibit access to certain comments or notes and some choose to remove some or all of their contributions. The design-based process is ideally suited for this research and although the aforementioned is an aspect of the study that may impact the results, although this is understood to be an element of a design-based study.

Concerns and challenges which might otherwise side line elements of a research project are expected and thus the multi-iteration process of the research allows for changes to the design, the environment, and the way that either the researcher or the participants choose to engage.

### **First Iteration of the Study (Implementation of the Intervention)**

“Design researchers... are trying to make something happen, and this frequently means crossing the boundary between observer and actor” (Bereiter, 2002, p. 326). “In [design-based research] the context of the inquiry must be seen as a means to an end rather than an end in itself. The intention should be to use the setting to gain an understanding which will have meaning beyond the immediate setting” (Herrington, et al., 2007, p. 4094). Design-based research methods may resemble other approaches; however, the main features that DBR uniquely offers are the generation of theory used to solve problems and having the researcher fill the role of both the designer and the researcher (Wang & Hannafin, 2005).

The first iteration of the study begins in the summer of 2010, with several changes being made to the course to allow for the use of the archive on an on-going basis. There is the previously mentioned final reflective assignment ([Appendix C](#)) added to the course with wording that would hopefully encourage participants to see the archive as an intrinsic part of the course. I spend considerable time working with the pre-2010 archive in order to ensure I understand as much about the archive as possible and to appreciate the types of challenges new course participants might encounter. I was involved as a TA in one of the two previous iterations of this course, as indicated earlier, and therefore was familiar with the older Elgg environment.

My familiarity with this older environment leads me to make some initial assumptions about the September 2010 environment that are incorrect and cause some initial confusion with the course participants. The archived data had not been properly moved over from an older version of Elgg when the system was upgraded in January 2010. All of the post headings had been transferred to the upgraded version but for reasons that are never explained by those managing the Elgg environment, all of these posts are empty: they had no content. I note that the headings were present but do not go into the postings to confirm content and this is not spotted until students begin to use the archive. This confusion slows down the initial engagement with the archive and may dampen some of the enthusiasm for its use in this first course iteration. There are no direct statements from students to support this observation other than tone and inference in the class comments.

Once some of the initial environmental challenges are dealt with in the first few weeks of the course I realize that a synchronous session is needed to answer questions

about the archive, my research, and the Elgg environment itself. I quickly realize that language is something that needs clarifying and that students interpret and reinterpret differently what I initially feel are clear and obvious statements. For example, my use of the words archive and artefact are understood in so very many different ways and as a result, I have to find different ways to express the different meanings and intent of these words. For example, I discover that although I see the archive as I describe it throughout this document, some of the students are expecting to find a formal location entitled “archive” with a clear doorway and guideposts. The word artefact is initially perceived by a number of students to mean a clearly defined historical example and it is only after one of the early synchronous sessions that students begin to see these terms in very broad ways and they then begin to share meanings and talk to each other using these terms in a more unified and clearly understood way.

I set up a private room within the Elgg space for those who agree to participate in the research. At different times I encourage active research participants to enter and extend the conversation in this private research space. There are a few individuals who make a concerted effort to engage and provide rich commentary in this closed room; however, I found that most students are just as happy to have these extended conversations about the research in a more public venue within the general course space. This proves to be a positive thing in the long run as I find that the open course conversations are more engaging and have a broader centre of content than those held within my reserved space. Also it is one less place for students to go and check for new content.

“Design research is guided by some vision of as-yet-unrealized possibilities and is characterized by emergent goals—that is, goals that arise and evolve in the course of cycles of design and research” (Bereiter, 2002, p. 326). This first iteration begins with a series of assumptions as outlined by the questions indicated in [Appendix B](#). These statements are made available to all of the course participants in an attempt to make my research as transparent as possible. Responses to these questions, and other issues that arise from the first iteration of this study, are used, in part, to determine changes to my study in the second iteration. The flow of the course (both iterations) is a mix of asynchronous work, an iterative assignment, and a series of synchronous sessions to allow both the professor and the participants various opportunities to check-in and keep in touch throughout the course. During the first synchronous session with the class, I am introduced and given some time to explain my study, how students might participate in my research, and the potential impact of my participation and my research on their course. Subsequent to this I send an email [[Appendix D](#)] to all course participants inviting their participation. The email contains the *consent to participate* documentation asking those who wish to participate to clearly indicate *Yes* and to return the email to me. Table 1 at the beginning of Chapter 6 outlines the participation/response rate and the demographics of my study. The nature of this study precludes a random sampling of participants. “Because of the highly situated nature of design-based research, participants in a design-based research study in education are central to the investigation” (Herrington, et al., 2007, p. 4094).

There is no way in this study to determine why students choose not to participate other than several write to me indicating that they would like to participate but feel that to

participate would take time that they feel is not currently available in their schedule. In all cases I respond thanking them for considering and suggesting that participation will require very limited time beyond class participation. I resend my initial invitation email to those who have not yet responded with a note reiterating the nature of the study and what would be asked of them should they choose to join the study. None of these individuals change their minds and I make no further overtures to those who choose not to participate.

At several times during this first study iteration I indicate that although I am attempting to engage with everyone (n=27 in iteration #1), all students are advised that everything added to the course environment during the time of the course is being retained. Students are advised that regardless of this content retention, in this study I am only permitted to capture and use conversations and content from those who give their consent. I indicate that regardless of the data I capture, everyone and every reference will be “anonymized”. Anonymizing will be my process of editing contributions only to the extent that I remove or alter text that might identify an individual in any way. Most participants appear not inhibited in their conversations as most appear focussed and engaged with each other, their professor, and their assignments. There do not appear to be any comments or other indications that their every step will be captured and analysed at some later date. I cannot know if my observations and active participation as a researcher creates any form of a Hawthorne effect (Michael, Garry, & Kirsch, 2012) on the study participants. The Hawthorne effect is where “people sometimes behave differently if they know they are the object of study” (p. 152).



During the third week of the first iteration I conduct a voluntary synchronous session to talk about the course and my research. Although there are only eight participants in attendance, the conversations move in such a variety of directions that I come away believing the students are very engaged, have a reasonably solid understanding of their course environment, and understand my role and research agenda. At first I feel that having such a small number of participants at this session is a negative indicator; yet these few participants take their understanding of the meeting and *talk it up* in the general course area. Very shortly this community begins to share understandings and the greater body of the course appears to benefit from these conversations. The idea of the archive is beginning to take hold.

I work with the course participants as they access the archive. For example, I provide links to some of the archived items. I also provide a variety of guided outlines directing students to different resources. I engage a number of the students in conversations about their search and how this might best be accomplished. There are a variety of challenges ranging from a lack of familiarity with the socially networked learning space to the seemingly haphazard nature of the existing archive. These challenges include both very limited tagging on the part of those who left items previously in the environment as well as the very limited search tools available in the version of Elgg that is being used in the first iteration. The first course assignment requires students to use the archive as they build their business model. “In design-based research, methods and analytical procedures are selected and applied because of their utility for furthering the research project rather than because of their abstract ‘power’ or refinement” (Herrington, et al., 2007, p. 4094). Students appear challenged by this added

archive search piece. Those who find meaningful support artefacts in the archive become the bellwether for others and this shared knowledge and understanding becomes a hallmark of many of the conversations. Challenges range from how to use the archive, to *why would I want to use it*, and *what is the relationship of the archive to my learning*.

Most of the students in this first iteration access the archive and speak about their challenges, understandings, and the impact the archive has upon their course. I use the word *most* because I have no way of knowing if all of the course participants use it. Those who more actively use the archive leave items behind, and help push the overall conversation in rich and meaningful ways. I do not study or capture this particular phenomenon. The only individuals who choose to leave assignments behind for the next course group are those who are part of the study group. None of the *non-participants* in this study leave specific files behind for future students. As I extracted the participant data from the course as a whole, there appears to be a greater preponderance of thick data from the *consent* group as from those who choose not to participate in my study. There may be research to support this level of engagement but my study does not include any of this. At the end of each of the course iterations I go into the course and read all of the content for every participant but only extract and use content from those who provided consent. I do not use any of the conversation data when there is a conversation between a *consent provider* and a *non-consent provider*. My comment above regarding a greater preponderance of thick data from the consent group is an observation I made during this data extraction process.

Towards the end of the first iteration I invite study participants to be part of a follow up telephone interview. Initially five of the first iteration agree to such an

interview but when the time comes for these interviews only one participant eventually finds the time. I believe that the seasonal timing (Christmas) is a factor as several of the initial group keep rescheduling as a result of holiday and family pressures. I approach this aspect of my data capture differently with the second iteration and as a result I am able to interview more individuals from the second group. See Table 1 for the specific numbers.

Towards the end of the first iteration of this study students become more engaged and they begin to talk about the tangible benefit of their efforts and contributions to the course archive. This comes through in their language and the tone of their conversations. For some there is an excitement about the fact that their work is going to be used by students in the next semester. They begin to realize that they can contribute to the learning of others. As is indicated in the results chapter, some begin to speak as though they are talking in the present to those in the future. The archive begins to take on a different shape from when this first iteration group began their course journey. Although students in the very first two sections of this course (prior to my study) were aware that their data was captured and retained, there was no active conversation about the archive and its potential use and value after their course section was finished. In the first iteration of this study, the archive conversation (why it was there and how it might be used) is in the forefront of the conversation throughout the course and everyone is aware that students will be using their data in the next immediate semester. I do not study this aspect of the data capture and use of the archive but again the tone of the conversations towards the tail end of the first iteration suggest that knowing of this immediate next use might positively impact their level of engagement.

The nature of the archive may be impacted by current and future contributions due to a clearer understanding of the impact of archive contributions on the part of learners. These study participants may very well alter the archive with their broader insights into the archive's use. It is one thing to contribute to the discussion on a regular basis with the peripheral knowledge that one's work will be saved for future learners to read and dissect, but to have spent time reading and dissecting the work of others should now give different meaning and understanding to the nature and value of one's contributions. Some of these issues became clearer in the second iteration and these are discussed in the following section.

### **Second Iteration of the Study (Implementation of the Intervention)**

Iterations with a design-based model encourage change to the environment where needed based upon what is learned by studying the first iteration. There are no physical changes to the assignment or to the virtual classroom. The larger and improved Elgg environment offers some changes to search capabilities as part of the on-going evolution and support of the social networking tool within the university. This offers students in the second iteration an easier to use learning environment tool set. In my study changes come in the form of the way both the professor and I engage the students and in the way that the first iteration changes the course landscape. The professor and I realize that we need to communicate about the tools and the learning environment using different language and terms from what had been done four months earlier, although a clearer archival structure materializes as a result of use made by the first iteration of the study: the landscape is different. Students from the first iteration leave behind greetings and very overt guideposts for this second group. Therefore the starting point for this second

group is very different. The first iteration alters the continuum and therefore the second iteration is entering a very different learning space. As a result the professor and I realize that we need to manage the environment in a different way. Accessing items in the archive is less onerous and therefore the distraction caused by access issues in the first group is less of an issue for the second group. This allows for more time spent becoming involved with items in the archive and bringing these conversations into class discussion, thus allowing the second group the opportunity to find potential value in the artefacts.

Besides being a different group and coming together with a different dynamic, the second group engages the archive in somewhat of a different way. This is, I believe, because this new group encounters archival content that is written to them based upon the experiences of a group of students that preceded them and knows that this new group will be viewing their work: the archive for this new group is more personal. There is nothing to suggest that the second group is overly different from the first group. Their willingness or tentativeness with regard to the archive appear to be similar to the first group. The professor and I evolve and learn as a result of our first group experience and develop an understanding of what works and does not work regarding the archive. Our engagement with this second group is different.

These differences surface in some of the following ways. In the first iteration there are various questions and issues about the assignment and what the archive might offer to assist in their learning. Although I had been a part of this course as a TA in a previous version, I am now viewing the core assignment and the archive quite differently, and so trying to appreciate the student perspective is a challenge. By the second iteration I better understand what types of issues and concerns students have regarding the

assignment and the archive; therefore, my engagement with this second group is more seamless. Both the student level and my level of trepidation appear to be less. Also by spending four months actively engaged with the 27 students in the first group (the second group has 26 students) I got to know who created what and how each contributed to the archive, so that when asked by the second group about certain aspects of the archive I have a more intimate knowledge of the contributors. In many ways this alters the student view of the archive in terms of access and value. Student efficacy appears to rise and this second group appears to look after themselves more than did the first group.

As noted in the first iteration discussion, I invite students from the second iteration to be part of a post-course telephone interview. I am eventually able to conduct seven interviews. The difference in number from the first iteration (only one interview) may have had to do with how I approach the participants, how I am able to ensure we can meet within their timeframes at the end of the course, and because this second group appears to have a richer engagement with the archive and appears more willing to talk about it. I do not have data to verify this but the clear discrepancy in numbers regarding interviews from the first to the second group, apart from the issue of the Christmas season after the first iteration suggests there is a different experience in the two groups.

“Design-based research implies outputs in the form of both knowledge and products. While these outputs are difficult to specify in advance in the research proposal, it is useful to be able to describe the process of their development” (Herrington, et al., 2007, p. 4095). This research study suggests that the day-to-day online discussions produced throughout these socially networked online courses contain evidence of tacit knowing, as described earlier, and other processes relevant to understanding, the learning

process, and knowledge creation. If accessed and integrated into learning environments these tacit knowing archives can enhance both the learning environment and the learning process. The purpose of this design-based research project is to try and find evidence and use of these tacit processes as well as to use a design-based approach as a means to generate further questions, which could open doors to further research in this area. The core idea of the archive is not to just access and engage the archive but to also become aware of one's continual contribution to the archive. Part of the process is to learn to be aware of one's learning and in so doing, attempt to find ways to integrate the access of the archive into new contributions. Use of the archive should assist the learner in seeing and understanding different ways of expressing oneself such that, in time, the contributions can become a greater source of tacit understanding.

### **Ethical Considerations**

There is a relationship between the faculty member teaching the two course iterations and me. This faculty member is my supervisor. As with any close relationship, there is the potential for this relationship to interfere with the study and/or the results. In this study I am a visible observer and active participant in the course, and the course participants have been informed of my role and responsibilities in the context of the course. Interviews and discussions with study participants are conducted using media that provides an appropriate level of privacy and all the collected data is secure. None of the raw data is shared with the professor. Issues that may have served to identify individual students (course or non-course related) plus any specific student and/or course concerns are not discussed with the faculty member until the completion of the course

and final marks are submitted. Distilled and publishable data is only being shared with the faculty member as a result of the production of this dissertation.

### **Data Collection, Analysis, and the Coding Process**

The validity and reliability of a uniquely qualitative research project such as presented through this research needs to be addressed. Morse, Barrett, Mayan, Olson, and Spiers (2002), challenge the language used to describe rigour in qualitative research and “*make a plea for a return to terminology for ensuring rigor [sic] that is used by mainstream science [italics in original]*” (p. 1). These authors argue that by altering the language describing qualitative rigour as was done by Guba and Lincoln (1981) and others, researchers end up using “the wrong tactics to defend qualitative inquiry” Morse et al., 2002, p. 15). They go on to add:

We suggest that by focusing on strategies to establish trustworthiness (Guba and Lincoln’s 1981 term for rigor [sic]) at the end of the study, rather than focusing on processes of verification during the study, the investigator runs the risk of missing serious threats to the reliability and validity until it is too late to correct them.  
(pp. 3-4)

The above serves to bring to light issues and concerns regarding the rigour of qualitative research and how different individuals view what can or should be defined as valid and reliable. Guba’s (1981) use of the term “trustworthiness” and related language and strategies to establish verification of a study do not necessarily have to occur at the end of the study as described by Morse et al., (2002). These authors raise challenging questions regarding the process of verification and I attempt to use these strategies to demonstrate the reliability and validity of my data. I will also outline and provide



evidence of two of the four standards (transferability and dependability) set out by Guba (1981; Guba & Lincoln, 1982). Evidence of this verification and support for the reliability and validity of my data can be found in my final chapter following the section where I re-examine my research questions.

My active participation as a member of the study, as well as being the researcher offers me a unique perspective with personal notes as well as working with the research participants throughout their time in the course. The interviews conducted at the end of the course have a specific question-based focus, although they also help to serve as a form of member checking. During the interviews we speak about each interviewee's contributions to the course and how I use this in my final analysis. Additionally, in Chapter 6 I provide thick description of the various coded areas of the data.

The data for this study consists of study participant conversations held within the various areas of the Elgg environment as well as personal interviews. Part of the participant conversation data consists of discussion and blog postings made by study participants in the virtual class space or course group in the Elgg environment. The original text still exists within the confines of the online course and is still accessible by all individuals who at any time were part of this course. I have no control over this original data other than being granted permission to copy relevant pieces of text based upon consent agreements made and agreed to at the start of my research. As indicated at different times throughout this dissertation document, course participants control what they add to their course and with this control they also have the right to delete any or all of their contributions at any time now or into the future. As such, subsequent deletions may have occurred with some of the original text in this course or in the various private

or public places in the custom Elgg environment where these conversations originally took place. Decisions to keep, alter, or delete any of a student's contributions rests entirely within the control of that individual.

I copied unedited text from the research participants held in the custom Elgg and removed any reference that may have been linked to someone not part of this study. I attempt to do this without altering the context of what is being said, although at times this may not have been possible. I did attempt to ensure that when I used pieces of text in the results chapter I reread any text I had removed to see that the context was maintained as best as possible.

My data set consists of all of the personal blog postings, class discussions, or other contributions pertaining to this course, including the end-of-course reflections of the acknowledged research participants along with any blog postings and comments that were added as a result of subsequent responses to their reflections. The Elgg environment is not a single place for events. Members of the community have the option of posting entries in a variety of locations. This spread out approach to postings occurred with my class study environment. There was the walled classroom space for much of the course discussion. Students also made class-related comments in their own personal Custom Elgg blog space outside of the classroom as well as in more public areas. Students might post in these more public areas in an attempt to engage a larger audience beyond their classroom peers. I only captured conversations made by the research participants in private or public areas and did not include any non-participant contributions in any of the data.

Each element of the data is copied and stored in text files. I went through each and removed all personal and geographic identifiers while adding code names for the various research participants. I have included a sample of this data from the first iteration in [Appendix E](#) and from the second iteration in [Appendix F](#).

Earlier I mentioned codenames. These codenames appear with the preface “SCB” followed by a number representing that individual in the study. “SCB” are my initials and I used this naming convention as a way of ensuring I could sort the data files on my personal computer. There was no pattern or order in the choosing of numbers attached to participants other than I assigned numbers to the first iteration of the course and then continued adding numbers when the second iteration was added.

In some cases my data does not permit me to identify a quote with a specific code-named individual and in these cases I have identified the source as *Anonymous*. These quotes are not anonymous as they do belong specifically to one of the consent individuals in the study. The way that some of the data was captured and the nature of the back and forth conversation caused their words not to be specifically identifiable with an individual in the study. These were conversations between *consent* individuals in the general course file. I could not be sure exactly which of several individuals made the comment and therefore I labelled those particular comments as coming from *Anonymous*.

I went through the course group main area within the custom Elgg and, based upon the structure of the environment, I identified and copied all relevant text from each of the research participants. My use of the word relevant in the previous sentence refers to those portions of the text that I could copy based upon the agreements signed by the participants. I did not copy references to any non-research participant students that were

included in research participant text. The structure noted above refers to defined areas within the course class group in the custom Elgg, as seen in Figure 1. Almost all of the text conversations came from the *group discussion* area as this appeared to be the most common area where students carried on their class conversations. At times, in capturing this data it was a challenge to figure out who might be referring to whom. When there was doubt about whether the speaker was in the study or not I left the conversation and related conversations out of my data capture. The only pieces of unattributed text that I did keep were those that I could clearly see were between two study participants. Although I may not have been able to identify who was speaking I was able to separate the text and identify it accordingly. I discuss these conversations by using what I have chosen to call *Anonymous*, as explained above.

Figure 1: Elgg Group Structure



In addition to the main group discussion file I also maintained a separate Elgg closed group for research participants. This was an invitation-only, closed space within the Elgg environment where all research participants were invited and this is intended as a space or place for more focussed conversations about the archive and the research. There were some initial conversations in this closed group in both of the course iterations. As the course went on, the participants seemed to feel more at ease having these conversations in the more open space of the course. As with the data captured from the main course group, I captured this research conversation group text, I anonymized it, and stored it within a separate text file. In addition to these more general text files there are eight files representing each of the student interviews.

I use coding software for my Mac called HyperRESEARCH. This software allows me to connect all of my data files to a single case study and from there I begin the process of manual coding. The final analysis and coding of my data took almost a year and a half to complete. Personal issues overshadowed my ability to complete my analysis of this data when it was initially gathered and delayed the writing of the results in a timely fashion. Although unplanned and unintended, this delay allowed me to re-examine my original analysis and thinking about this research project and re-evaluate my understanding of my data, the process of collecting it, and ultimately, what the data would eventually tell me. Although I do not formally address the data or attempt to assess it in keeping with the linear flow of the collection process, “the process may not be linear” (Morse et al., 2002, p. 12), this delay permits me to talk to a variety of individuals about my cursory understanding of this data and my research questions. In the process I am able to begin to see the results in a more comprehensive way as a result of this

lengthy process of self-reflection and rumination. I read and reread the various data files to reacquaint myself with the conversations, the interviews, and my notes. Then I worked with my three main questions as the basis for my initial coding, or first cycle coding as defined by Saldaña (2013). All of my coding is manually done within my coding software package. I am the only individual to work with the data and to code it.

My three core research questions are truncated as first cycle codes in the form of: use, value, and challenges. Throughout the study I keep these three words front and centre as the benchmark against which I attempt to measure how the students are working with and responding to the archive. I use these words as *descriptive* codes (Saldaña, 2013), which becomes “the basic topic of a passage of qualitative data” (p. 88). Additionally I use the process of *subcoding*, which “is a second-order tag after a primary code to detail or enrich the entry” (p. 77). These subcoding processes lead to some instances of *simultaneous coding*, which is the “application of two or more different codes to a single qualitative datum” (p. 80). Saldaña (2013) cautions against an excessive use of this technique. He does add that this form of coding “is appropriate when the data’s content suggests multiple meanings that necessitate and justify more than one code” (p. 80).

My sub-category titles come about as a result of my perception of the first instance of my interpretation of what is being said by the research subject. My choice of the words or phrases that I create is my attempt to best describe what is being talked about. I attempt to use language that is relevant to my study. As I come upon similar ideas or concepts I add them to this coding phrase or, in some instances, I rephrase the subcodes to better describe the nature of the sub-group category. When I finish my initial

data coding I find that I created 70 codes within five main headings, as well as six codes that do not fit within the main headings.

Figure 2: Initial Coding Scheme

Code	Total	Bar Graph
Challenges: personal efficacy	79	
Value: the process	77	
Value: rich resource	67	
Use: Sharing	65	
Challenges: navigation	51	
Use: learners understanding use and value	42	
Tacit	36	
Value: personal learning	36	
Value: perception	34	
Challenges: time	29	
Custom Elgg: Blogging	28	
Challenges: custom elgg	26	
Challenges: LMS vs SocialNetwork	27	
Custom Elgg: navigation issues	25	
Use: why use the archive	26	
Value: future	26	
Custom Elgg: Other environment comparison	23	
Use: ideas for the future	24	
Use: specifically looking for something	24	
Value: to help others	23	
Value: current	19	
Value: limited	19	
Challenges: negative	16	
Use: Frustration	16	
Use: Limited	16	
Value: beyond this course	17	
Challenges: the content author	14	
Custom Elgg: bookmarks	15	
Custom Elgg: valuable social environment	15	
Value: changed over time to positive	14	
Challenges: Plagiarism concern	11	
Challenges: solutions	12	
Custom Elgg: strategies for use	13	
Value: exciting	12	
Custom Elgg: initial thoughts	9	
Value: personal	10	
Challenges: hindered learning	8	
Value: alumni support	7	
Value: as a scaffold	2	

The five main headings, based upon my three core questions are: use; value; challenges; the fourth main code heading is the Elgg tool set, which is the social-

networked learning environment that housed the virtual classroom for this course; and, the fifth main heading is titled Tacit and this was used to capture items that I believed best represented evidence of tacit knowing. These 70 codes are affixed to 1,090 coded pieces of text and all of this text comes from the thirty-five files as described above. These initial codes can be seen in Figure 2 (Figures numbered 2 – 7 inclusive are screen capture images of my coding as it appears in my HyperRESEARCH software). Saldaña (2013) suggests that the number of codes one ends up with is driven by the context of the study and the degree of detail “wanted or needed” (p. 22).

After my initial broad coding I re-examine my codes a second and a third time and attempt to merge or re-align some of the codes to better reflect what is being said or discussed. I discover that by re-reading the data and reflecting upon the codes used the first time through, I see some of the coding and some of the coded text in a different light, and either merge or recode the text to better reflect my understanding of what is being said. This results in fewer codes, as displayed in Figure 3. During the merging and recoding process I discover that not all of the previously coded pieces of text fit neatly within their newly refined categories. I attempt to ensure that the idea or sentiment being articulated is placed in the subcode most suitable for what is being articulated. I am the sole researcher and sole coder for this project. My original three, first order codes set the tone for my coding and the addition of the fourth and fifth first order codes, *Custom Elgg* and *Tacit*, also fits within the frame of the research conversations through the time of the two iterations in this study.



Figure 3: Coding Refined and Sorted

Code	Total	Bar Graph
Challenges: custom elgg	26	
Challenges: hindered learning	8	
Challenges: LMS vs SocialNetwork	27	
Challenges: navigation	51	
Challenges: negative	16	
Challenges: personal efficacy	79	
Challenges: Plagiarism concern	11	
Challenges: solutions	12	
Challenges: the content author	14	
Challenges: time	29	
Custom Elgg: Blogging	28	
Custom Elgg: bookmarks	15	
Custom Elgg: initial thoughts	9	
Custom Elgg: navigation issues	25	
Custom Elgg: Other environment comparison	23	
Custom Elgg: strategies for use	13	
Custom Elgg: valuable social environment	15	
Tacit	36	
Use: Frustration	16	
Use: ideas for the future	24	
Use: learners understanding use and value	42	
Use: Limited	16	
Use: Sharing	65	
Use: specifically looking for something	24	
Use: why use the archive	26	
Value: alumni support	7	
Value: as a scaffold	2	
Value: beyond this course	17	
Value: changed over time to positive	14	
Value: current	19	
Value: exciting	12	
Value: future	26	
Value: limited	19	
Value: perception	34	
Value: personal	10	
Value: personal learning	36	
Value: rich resource	67	
Value: the process	77	
Value: to help others	23	

Research into transcript analysis suggests there can be difficulties in determining “discrete and useful categories.... Reliability is directly affected by lack of discriminant capability: if categories are not clear, discrepancies in coding will occur” (Fahy, 2001, p.

2). Fahy (2001) goes on to add that two of the causes for this discriminant capability may be the “complexity of the instrument... and use of an inappropriate unit of analysis” (p. 2). I cannot suggest that my coding is without fault; however, I use Saldaña’s (2013) suggested approaches for my codes, subcodes, number of codes, and the specific units I code. In qualitative data analysis, Saldaña (2013) defines a code as: “a researcher-generated construct that symbolizes and thus attributes interpreted meaning to each individual datum for later purposes of pattern detection, categorization, theory building, and other analytic processes.... A code represent[s] and capture[s] a datum’s primary content and essence” (p. 4).

I refine my codes by going through the data on three separate occasions, using knowledge gained from the previous coding exercise and finding ways to refine and better express the data through these codes. For example, the subcodes I choose attempt to signal or identify the core of the idea or the sentiment expressed. Each of these subcodes should be similar given the focus of my first-cycle coding.

Saldaña (2013) discusses the validity of the work of the *sole coder* and outlines strategies with respect to the trustworthiness of the process. “(1) Check your interpretations developed thus far with the participants themselves; (2) initially code as you transcribe data; and (3) maintain a reflective journal on the research project with copious analytic memos” (p. 36). In my process I do not directly check with the participants regarding the specific subcodes. It is as a result of aspects of my interviews (particularly after the second iteration) that I begin to support elements of the subcoding process as the interviews help to confirm my interpretations of my code meanings. My understanding of student engagement with the archive helped to clarify my development

of these codes. I begin a cursory process of subcoding immediately after I bring the data from the Custom Elgg environment and begin the process of anonymizing it.

Additionally, I was able to reflect upon aspects of my journal, albeit I did not maintain “copious analytic memoos” (p. 36).

After the merge and re-alignment process noted above, I reduce my total to 39 codes. Although this is still more codes than originally suggested by my supervisor, I stop merging and re-aligning these codes because I realize that although there are some codes that are used infrequently, codes with few connections to text can be just as important as the codes that are used over and over. Saldaña (2013) suggests that: “coding is not just labeling, it is *linking*” [Italics in original] (p. 8). I see possible linking in all of these codes whether they are used frequently or not. I will discuss each of these codes in detail in the next chapter, along with student perceptions structured through the lens of each of these codes.

### **Chapter Summary**

This methodology chapter outlines the foundational supports for the research model used in this study. The pragmatic business management theory that is threaded throughout my study (OKCT) is laced with a socially constructed context (*ba*) and this ultimately shapes my research paradigm. As discussed in this chapter, my research approach is primarily constructivist/interpretivist and this supports my use of the subjective conversations with the research participants.

My design-based methodology, albeit a very pragmatic approach, offers me an opportunity to frame my research in an iterative way. Most importantly, however, this also permits me to be both a researcher and an active member of the environment within

which the research study takes place. Ultimately, this methodological approach leads to the development of design principles: new ideas and approaches that become evident from the data analysis and are outlined in the final chapter.

This methodology chapter outlines both the research environment and the accompanying intervention. Tied to this is also a short section dealing with ethical concerns regarding my relationship with the course professor. The chapter concludes with a lengthy section discussing my data collection process, analysis, and coding process. This data collection and analysis section sets the stage for the next chapter outlining my results.

## Chapter Six: RESULTS

### Chapter Overview

von Krogh, Ichijo, and Nonaka, (2000) suggest that there are five enabling factors or conditions in support of the process of knowledge creation. These are: instilling a knowledge vision; managing conversations; mobilizing knowledge activists; creating the right context; and, globalizing local knowledge. Thomassen and Rive (2010) examine these conditions in a teaching and learning context and at the end of this chapter I summarize how, in a similar teaching and learning context, these factors are supported in my study. In my research I use an educational context to demonstrate how OKCT can find a similar home within the context of socially networked online learning environments. This research project creates a conversation about factors that influence learning and knowledge creation and how these factors can be acknowledged and supported within such a socially networked learning environment. In doing so, I examine the use, the perceived value, and the challenges faced by learners as they interact with learning artefacts and each other in this social-networked learning space. This study seeks to answer three core questions. These questions intend to assist in understanding whether and how learners might use an archive, whether they see value in its use, and what kinds of challenges they were confronted with as they used these resources throughout their learning. I intend to use these three core questions as the beginning of this results chapter and will expand from there after an initial discussion focussing directly on these three core areas. Additional issues come to light as a result of my examination of the data and these are also introduced and discussed in these next four pages before the results are introduced in an attempt to contextualize my data.

Table 1: Study Demographics

Course Statistics and Population Details	Iteration 1 (Fall 2010)	Iteration 2 (Winter 2011)	Total
Total population (N)	27	26	53
Total population gender ratio M/F	8/19	9/17	17/36
Number and percentage of the total population who signed a research consent document	14 – 52%	12 – 46%	26 – 49%
Research population gender ratio M/F	4/10	5/7	9/17
Number of students whose course contributions are included in the study data	11	12	23
Number of students from a prior course section who were a periodic participant in the course	3	1	4
Number of students who withdrew subsequent to signing a consent document and who removed all personal data	1	0	1
Number of students who signed a consent document and who withdrew from the course and made no contributions	3	0	3
Number of students interviewed subsequent to the course	1	7	8

## **Study Demographics**

The results of the study outlined in this chapter, emerge from data collected from two consecutive iterations of an online Masters' level course in the planning and management in distance education and training. Students in this course are expected to build a strategic plan for an online learning program and are provided with access to an unsorted archive of comments, discussions, and various other artefacts from three previous iterations of the same course. They are expected to add to this resource throughout their time in the course. Table 1 outlines the demographic makeup of the course and the study population.

## **Data Issues and Context**

Support for the intervention range from outright support for the use and value of an archive and related artefacts, to tentative acknowledgement of its value. This support is based on a variety of factors ranging from things that got in the way of student use of the archive to a general struggle around the process of learning within a socially networked learning environment. As discussed earlier in this document, the socially networked learning environment becomes a significant point of discussion and, as the data shows, the learning environment at times clouds or at least confounds the issue of the use and value of the archive, yet it also showed the impact of such an environment on the learning process. I do not want the reader to misinterpret my use of the word "clouds"; however, the newness and novelty of this social learning environment provides a challenge for many of the learners. There is a lot of time spent in discussions where the environment challenges students. They talk about these concerns at length rather than

just using the archive and working within the environment. I address the issue of the environment specifically in this current chapter.

There are several factors that surface within the data that I had not imagined or originally planned for. The exciting part of using a design-based model for my research is that it allows for new domains to be explored and brought into the conversation as a result of the findings after the fact. The main unintended area that becomes quite evident throughout the data is that of personal efficacy. This issue is added and examined in this results chapter and can also be found in the literature review chapter. Additionally, throughout this chapter I attempt to demonstrate linkages between the theoretical foundations of this study, as outlined in the first two chapters, and the results as presented through the words of the various research participants.

Another issue concerning the data and the research participants is that as I code each research participant's contributions, I begin to see that not all of the research participants are as outspoken or as passionately excited about the course and the archive as are others. Some of the research participants contribute very little about certain aspects of the course. Even their responses to the final reflective questions are terse. The impact of this appears below in terms of my discussions concerning each of the coded items. Some participants have much to say within each and every one of the codes, whereas others contribute little or none in some instances. This may cause the reader to question an apparent overabundance of contributions from some participants. Just because someone agrees to participate in the study does not guarantee that they will add meaningful or quantity input into their overall contributions. In one interview, for example, the interviewee speaks about particular aspects of their course journey but little



of the conversation is directed at or focussed on the use and/or value of the archive. No matter how I attempt to bring the conversation back to these issues, the individual sticks to their agenda and this remains beyond the purview of the research focus.


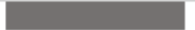





One more note regarding the data: I realize that at times students use the words intended to describe the overall environment, *Custom Elgg*, in an interchangeable way with the word *archive*. They speak about this environment using the name of the environment that I have code named *Custom Elgg*. Yet based upon the surrounding text it was clear that they specifically mean to also use this term to infer the *archive*. I attempt to discern when I believe a student is meaning one term over the other. Although the student may use the words *Custom Elgg* in their quote, I use this term when talking specifically about the *archive*.

Figure 3 (displayed in Chapter 5) is a re-framed representation of the set of 39 codes that I finally use. It is ordered based upon the five main headings. It is with these groupings that I begin to outline the results section of this study beginning with “Use”. In this next section, after each of the sub-headings introducing the sub-coded item I will provide an “n” representing the number of coded pieces of text associated with each of these codes or sub-codes.

### **Results: Use of the Archive**

Using the broad category of the “Use” of the archive I break the data down into seven sub-categories as illustrated in Figure 4. I intend to briefly discuss each of these subcategories in terms of what the data outlines. I provide some examples of what is said by the research participants, I offer context for the various comments, and also attempt to tie these issues back to the base theories of this research project.

Figure 4: Use Subcodes

Code	Total	Bar Graph
Use: Sharing	65	
Use: learners understanding use and value	42	
Use: why use the archive	26	
Use: ideas for the future	24	
Use: specifically looking for something	24	
Use: Frustration	16	
Use: Limited	16	

### *Use – Sharing (n=65)*

The “Use – sharing” subcode is created to gather comments from individuals speaking out about either placing/sharing their own work in the archive for others or by making use of or sharing the work of others found in the archive. This latter use surfaces either in the form of explaining how an artefact benefits the learner or how a particular learner speaks about the potential value of a particular artefact whose use peers might benefit from. This subcode turns out to be the fourth most used code in this analysis.

“This is a wonderful discussion - I wonder if any of you looked at what others had to say on the topic 2 years ago. For example here is a link to a similar discussion in Sept 2008” (Anonymous). “@all, this is a great example of assignment 2 from...” (SCB-05).

When I stop obsessing on the assignments, I can see that the archive does provide inspiration, and an opportunity to learn from my student colleagues in a unique way. I’m glad we have it, and plan to take full advantage of it for the remainder of the course. (SCB-18)

Sharing is something that students tend to do with or without an archive. The types of comments made by those who know of and access the archive seem to demonstrate an increased awareness and understanding of the value of sharing with their

current peers, those from the past, and for those in the future. For example, “this has been a challenge! I have had the chance to read several posts made by classmates (all very helpful), and looked through past assignments on the Archive” (SCB-01). “A few comments I have would be that I really appreciated past postings and I will make sure to post my assignments also for others to peruse” (SCB-10). These individuals, all from the first iteration of this study, are aware that immediately following them will be another section of this course using the archive. Their ideas of sharing extend to the sharing of their time as well as their documents and assignments:

As a member of CRS<sup>4</sup> social group I will also stay rooted in the course community. As a new cohort of students starts the course in a few short weeks, I plan to lurk behind the scenes and perhaps join in when I feel I can offer unique assistance to the current set of students - much like others, such as SCB-25 and others, did during the Fall 2010 version of the course. (SCB-04)

There are several others in this group who very publicly discuss how they benefit from the archives, and make their work available and share it with others in subsequent iterations of this course. In particular, there is one individual who goes to great length to make all of her work available including her marks and professor’s comments. “I posted my papers there for others to have a look at because in a course like this you need lots of good examples, not so good ones and ones that need improving” (SCB-11).

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<sup>4</sup> CRS is the term I use to describe the name of the course that the students are registered in. The courses are numbered sequentially and a reference to CRS+1 refers to the next sequential course in the student’s program.

The first assignment was really tough for me. Although I did read other strategic plans, and I did go through the archives (which is why I loaded up my assignment together with professor's notes, so future students might benefit from the mistakes I made). (SCB-11)

There is no evidence to suggest that the actions of this one very open and public individual caused others to follow suit; however, a variety of others in both of the course sections comment on how they benefit from this very public process. For example, the following comments come from a student in the second iteration of this course and are tied to a reference regarding the actions of student “SCB-11” from the first iteration noted above:

I have posted all of my assignments on the Custom ELGG since I started the program, and hope they will be of value to someone someday, as the items I found were of help to me. I tried to make the file names as clear as possible, and use the right tags, and just hope that some like-minded individual will be able to find them. (SCB-12)

Some students talk about wanting to share but are prevented from doing so due to employer restrictions. “Unfortunately, I am not able to post my assignments #1 and 2 for that work contains confidential information in respect to my employer” (SCB-17). There are only a few of these examples, yet what seems to happen as more and more students talk about the sharing process, other students begin to speak to the next group as though they were present. “Maybe some future student will read this and remember that it is an academic paper, not a real business plan... if any future student reads any of my stuff, I’d be happy to share my experiences with them” (SCB-18).

If you want to see what I did for assignment #3, it is in my files I got full marks, so from that I figure this is a fair example of one way to complete the [assignment] If nothing else, I hope this gives you some ideas! (SCB-23)

Organizational knowledge creation theory speaks at length about the coming together and sharing of ideas in a safe and trusting environment. The above examples are only a few of the many that learners share with the full knowledge that others may read and judge their work. This sharing suggests that the sharing parties must have an implicit sense of trust, since sharing of work and instructor marks exposes both strengths and vulnerabilities.

*Use - Learners Understanding Use and Value (n=42)*

My second “use” sub-category is “Use – learners understanding use and value”. It is also my sixth most common subcode. The language used by some of the participants show the participants’ generally positive support for the addition of the archive and its impact on their learning.

Seeing other examples and feedback pointed me in the right direction. It was also kind of comforting to know that this resource was available if I needed to see how other students approached a certain topic. I think this was my favourite part of the custom Elgg environment and would be the main reason I would consider using it again in the future. (SCB-06)

Variations on the above comment appear repeatedly through the data. “This was one of the best things about this course. I used it over and over again... People should be shown in the first Elluminate session how to use it and what they can find there.” (SCB-

11). “It [the archive] seems particularly helpful when you need help either understanding an assignment, or it’s not your area of expertise, or you just want a nudge in the right direction” (SCB-18).

Once the initial struggle to become comfortable with the social learning environment subsides and students are shown how to use the archive, and are given examples of how it might benefit their learning, a sense of “wow this is neat” seems to have often taken over. Students begin talking about their experiences to their peers. The conversations become a more public articulation of an understanding of the use and value of the archive. This generates further conversations regarding the archive. These “understanders” become boosters for the archive. They not only speak very positively about its use and value, but also help to create an extended conversation drawing others in. Explaining how and why the archive is used supports this conversation. For example, “in working in IT, we always keep wikis of past documents” (SCB-21). Another way of looking at the impact of this very supportive group of students might be in terms of Rogers (2003) diffusion of innovations. I see these “understanders” very much in terms of “early adopters” or the “early majority” as Rogers describes the process of the diffusion of an innovation within an organization. As much as my research shows individuals who see the value of an archive early on in their course, there are others who are challenged by its value, just as Rogers describes the “late majority” and the “laggards” (p. 284).

A realization that the archive offers value through its use is very much an evolution for some of the students:

One of the benefits of having access to this older material is I can talk to somebody [the voices in the archive] who works in the same sort of environment that I do, faces the same challenges that I do, and see how they then have absorbed or reflected on that material. (SCB-19)

The individual quoted directly above prefaces their statement with “I wouldn’t have said that four months ago, because I would have said, ‘No, the students have to go through the catharsis of thinking about things’. And of course we do. But it doesn’t mean we should exclude [an archive]” (SCB-19). The evolution of learners in their use and understanding of the archive, as noted here, will also be discussed later with the introduction of the “plagiarism” sub-category, as student’s understandings evolve throughout the time of their course.

The following is a common sentiment as students begin to understand their use of the archive, “You get a little more richness to it [learning], because you get to see other comments from other people at other points in time” (SCB-15). Many learners generally “get it” and as a result use the archive as and where needed. An interesting sidepiece of this understanding is the fact that some have what they saw as an interesting struggle in their use of this resource. The following is an example of this struggle:

I still struggle with the "guilt" of peeking into the assignments and discussions of others. Intellectually I understand the value ("we stand on the shoulders . . .") but I guess my educational/practical background has made this feel awkward... it's like peeking in and watching how another class worked their way through a particular issue, or worked their way through a particular understanding of a concept, and it's [sic] been better. (SCB-19)

I am not sure that this feeling of “guilt” subsides. It appears that this individual and others are challenged by being invited into an environment with a richness of conversation and discussion, but where the speakers are not present and, in many cases, unavailable to provide comment or additional support for their archival contributions. The idea of a potential conversation with those who left artefacts behind may be worth further study.

*Use - Why Use the Archive (n=26)*

In the “specifically looking for something” subcode I attempt to capture just those comments that focus on looking for a specific type of thing; in other words, a very targeted search. In this “Use – why use the archive” subcode I lump together a range of comments dealing with reasons for use. These comments could have been merged with other use codes, but the range of issues highlighted within this sub-category helps to outline many different use reasons. This generic sub-category brings together different perspectives on what the archive is and how it can be used. For example, “[The archive is] ‘this is how somebody else went through it, what can I learn from that and apply it to what I’m doing’” (SCB-11). Comments in this sub-category are generally not repeated and this might diminish their value. As in this following comment I see opportunities for further research:

One thing the archive has done for me is allow me to get a sense of professor's assessment style. In the past, I have always found the first few weeks of a course to be somewhat of a chess game. I spend time trying to participate actively, but also trying to balance my other life commitments. After I hand in the first assignment in a course, I wait to see if the way I think I performed matches the



way the professor/facilitator sees it. The archive allows me to get some sense of how assignments will be graded, before I get my first assignment back. Even though assignment expectations are outlined on a course website, different people mark things differently. Viewing past marked assignments reduces some of the "unknown" factor and in return reduces my stress level! (Anonymous)

Students use the archive for many reasons. Although in creating this subcode I hope to find something very specific that might stand out, I begin to see that reasons for using the archive are almost as many as there are students. The individuality of students stands out, and in so doing, they express themselves through their use of the archive in these different ways.

***Use – Ideas for the Future (n=24)***

The sub-category “Use – ideas for the future” surfaces, in part as a result of conversations sub-coded “Use-frustration”. In many ways the nature of the student population (Master of Distance Education Students) seemed to dictate a need to talk about online environments and their future use. The course and program within which this study takes place is primarily one that attracts, and often employs, people interested in teaching and learning issues, notably those done at a distance. Thus this study population may have a more intrinsic interest in future use than non-educators.

In a few of the examples learners express their frustration, and later on in their conversation provide interesting suggestions for potential design changes to reduce their perceived frustration issues. In other cases I do not sense frustration from individuals who come up with new ideas; rather, it appears in this latter set of examples that individuals get excited by the idea of the archive and want to offer additional comments

on improvements to the archive concept. For example, a particular individual who works with aircraft maintenance expresses a real interest in the idea as to how he sees an archive having value in his work environment. He talks about how such a similar idea for an archive has been introduced, how the users are challenged by it, and, “It involved data, [and] people didn’t want to use it, because it wasn’t in their normal workflow” (SCB-13). This individual talks at length about the similarities of this course archive idea and the very large system his workplace implemented, and adds; “All the things that you’re probably seeing right now in how people are using the archive are there. But now more and more, that tool [the archive] is building the knowledge management on a whole fleet of aircraft” (SCB-13). Ideas come from use, from experience, from failure, and from frustration, and although I do not consciously seek ideas or suggestions for the future, as is expressed by a number of the research participants, their suggestions and comments serve to help shape my understanding of what and how an archive might possibly appear in the future.

*Use - Specifically Looking for Something (n=24)*

The idea that students use the archive for a very specific purpose – that they look for something specific rather than spending time getting a feel for the course and the types of issues previously discussed – is articulated by approximately half of the students studied. I create this subcode because I feel that students have a specific reason to want to find targeted items. “I was wondering how others had handled an assignment requirement for a business that was similar to mine, the Archives were useful” (SCB-04). “I found it useful to review other examples of assignments to ensure I was on the right track” (SCB-07). “The archive was a real life saver for me. I went over what others had

said and the work they allowed to be posted and it helped me reassure myself that I was going in the right direction” (SCB-11).

Initially I hoped that students might use the archive less for some specific answer in an attempt to understand the process of learning and knowledge creation; a somewhat lofty goal. This knowledge process view of the use of the archive appears to take a back seat and was not much talked about. The concept of process is captured as a “value” subcode and will be discussed when the code “Value” is examined. The conversation concerning the use of the archive and looking for something very specific was repeatedly outlined in the following way: “I found [the archive] very beneficial when I was questioning whether or not I was going down the right path. I was able to look at samples provided by previous students in the archive and better shape my direction” (SCB-09). I realize in reading the various students comments that looking for something specific and/or just looking to get a sense of the feel for the course or one’s place within the course becomes a blurred distinction. Student’s targeted use of the archive, although mentioned throughout the course by some students appears to have blended with other reasons and this, in part is discussed in the “Use – why use the archive” subcode.

#### ***Use - Frustration (n=16)***

Although the reader may look at the title of this sub-category and suggest that this might better belong under “challenges”, this subcode “Use - frustration” is one of several subcodes that can be cross-used and tied to different categories depending upon the context of the conversation. The issue of frustration arises as a function of use and primarily surfaces as a result of the struggle to reach into the archive and find meaningful data in a time frame commensurate with the student’s perception of the value of their

time. Most of the frustration issues surface early in the course. An example of these frustration issues can be seen through the words of a student in the first iteration of the course. “The idea of using an archive was exciting but trying to find things was very frustrating” (SCB-01). This sentiment is not unique, as it also appears from students in the second iteration in the following ways: “If anything I’d have to say that it was not me who couldn’t work the system, but the system itself that didn’t work for me. So it was frustrating at times” (SCB-12). “I find it a waste of time to search through an archive for an answer that somebody could give me in 5 seconds if I can ask the right question” (SCB-14).

I think people don’t want to have their time wasted so they would look in the archive, which I did, but, if you have frustration, and you don’t find things quickly, you won’t necessarily re-use it, even though it’s a great resource. (SCB-13)

User frustration wanes for most individuals after the first few weeks of each of the course sections as course participants get used to the environment and have a better understanding of how to access the archive. The few who continue to bring this issue up throughout the course appear to lack a connection with the social learning environment as a whole. This use frustration that carries on throughout the course appears, at most, to be tied to an issue of personal efficacy. The following quote from an individual in the second iteration comes from an interview at the end of the course. This individual cannot see value in the archive, feels it is a waste of time and effort and spends much of the interview discussing reasons why anything else would be better without the archive:

Even if you find something in the archive that is to do with your subject or is to do with your problem, it may not answer the problem how you want it answered.... So essentially, you're doing twice as much work for the same amount of information. (SCB-14)

This sentiment is very much in the minority. Had this been a more common sentiment, student engagement with the archive would likely have been greatly reduced and marginalized.

I try to see how each of the items in my four main coding areas can be folded back onto or threaded through the base theory of this research project. Although frustration in the use of anything new, challenging, or awkward, as is the issue outlined by this "use - frustration" subcode, the overall conversation suggests that this frustration issue can be expected with a large group of students trying to find their way in such a new environment. I find that by looking at the nature of the *ba* in the groups, the long-term implications of this frustration appears to be mitigated by the groups working together and supporting each other. Students speak about how the coming together in synchronous sessions helps them to realize how their peers and faculty are working with them to make the social-networked environment an effective learning environment, and how best to make it work for them as individuals. "This co-construction helps people to take the first hurdles (well, it helped me: what are we supposed to do? Am I doing the right thing?) and [it] offers more time to really focus on your own project" (SCB-05). "I think the learning from last night's session was invaluable especially as I laughed a lot and when I am laughing I am engaged and remembering!" (SCB-05). The group *ba* impacts the coming together. The resulting understanding that one's peers are working

towards a similar goal as well as seeing similar challenges and finding solutions appear to greatly reduce the issue of frustration.

*Use - Limited (n=16)*

I create the “Use – limited” subcode to describe comments from individuals who speak about the archive as a resource they know about but do not use, or at least peruse but in a limited way. For example, “I used it a few times to get an idea but I did not find other people previous assignments much use. I am not saying an archive is a bad thing, I just did not find it useful to me” (SCB-01). “I did not search the [archive] for previous threaded discussions. I just didn’t have time to do so” (SCB-07). “I cannot say that I did this regularly but I did do it. I liked being able to see the informal thoughts of other students” (SCB-09). These rather clearly articulated “limited-use” statements generally have some form of an attached reason why. As I discuss in some of the other categories in “value” and “challenges” these reasons may show ways that an archive might be made more accessible and/or more useful. I leave this as a separate sub-category because I find it interesting that a few of the research participants choose to speak out on their limited use; yet despite being offered other opportunities to explain themselves, they choose not to. I have no way of knowing whether those who choose not to participate in this study also share this view. For some, it appears that engaging this resource is not seen as part of their learning world and this may be associated with the lack of course marks awarded merely for using the social network system. In this study students were encouraged to use the archive but their use (or not) was not assessed for course grade.

### *Use - Summary*

Examples provided in this “Use” section offer a small window into some of the different ways and reasons students use the archive. For example, in the “Use – sharing” sub-category there are a great variety of comments offering examples of places to go within the archive to find specific articles in support of challenges that peers may have expressed earlier in the course. Language such as “try here” or “here are several that helped me” preface many of these comments. There are also a number of individuals that speak of placing their work in the archive for future learners. In doing so a number of these individuals provide reasoning and rationale explaining what a future learner might find by reading these artefacts. Learners in these two course iterations begin to see how the archive can be used. As the course moves forward they realize what they want from the archive, and therefore become very conscious of what they add to it to assist future learners.

Use grows with sharing and collaboration with peers. There are many different conversations that show a coming together as the groups help each other find ways to use the archive. As indicated earlier in this “Use” section, the *ba* of the group appears to have an impact on their shared understanding and use of this resource. This coming together also supports a sense of knowledge creation for many in the different groups. As they speak of their shared use and a common guiding hand as more and more of the group work their way into the archive and experience its value.

Examples of this are: “I open the Custom ELGG several times a week, sometimes just to read and reflect” (SCB-02).

You get to, to some extent, experience what another group has experienced, instead just being only this cohort and only the commentaries of the people in this cohort. You get a little more richness to it, because you get to see other comments from other people at other points in time. (SCB-15)

It's taken, I must admit, probably the better part of this course to get my head around the fact that it's okay and, indeed, beneficial to dig through this stuff.... I start seeing some of the things other people are posting. I check out this link, look at this from this other previous section, and I look at it and go -- the peeking through the curtain -- 'that's actually really good stuff' and it seems almost a sin not to explore it and then when you start looking into it, it really does cascade very, very quickly -- I just spent about two months to say 'yeah, this is okay.'

(SCB-19)

### **Value of the Archive**

The "value" code is divided into 14 sub-categories shown in Figure 5. As indicated earlier in this chapter and as is seen in this section, some of these sub-categories have few pieces of coded text attached to them. As is outlined in this section, these coded items remain of value to this study regardless of the paucity of supporting data. As I outline each of these value sub-categories there will be some subcode overlap. This will be discussed as the overlap occurs. The value code brings out a variety of interesting comments through the 14 subcodes outlined in the above figure. Within these subcodes there is only one subcode, "limited", that offers up comments speaking in a negative way about the archive. This represented less than 5% of the total number of value-coded excerpts.



Figure 5: Value Subcodes

Code	Total	Bar Graph
Value: the process	77	
Value: rich resource	67	
Value: personal learning	36	
Value: perception	34	
Value: future	26	
Value: to help others	23	
Value: current	19	
Value: limited	19	
Value: beyond this course	17	
Value: changed over time to positive	14	
Value: exciting	12	
Value: personal	10	
Value: alumni support	7	
Value: as a scaffold	2	

Students see value in various ways and I feel that the following comment very much captures the essence of the value of the archive:

The value of the archive, it's almost like the gold is [in] there but the gold is there in its elemental form and we need to put two or three pieces together to get gold.

The gold in your contribution is not your first paper and it is not your last paper but it is your first and last paper, along with all the pieces in between, because then you put all the elemental aspects together and there's the gold. (SCB-11)

#### ***Value – The Process (n=77)***

The “Value - process” subcode ends up being my second most used code. It is intended to capture comments where participants talk about the process of using an archive, the value of this process in their learning, and whether the process of including an archive into a learning environment has value. Comments range from valuing the process in their learning to being challenged by the process. For example, “I think that is the learning, the being able to see the process, is the learning” (SCB-15).

With this course more than any other I have taken thus far in my degree program it is ALL ABOUT process and not about outcome. What you learn from the first piece that is then applicable to the second piece, which in turn changes the third piece. [All-caps in original]. (SCB-11)

“I was thinking: ‘yes, it is never the result, but indeed the process that builds our knowledge and expertise, and a process only happens if you take time to let it evolve’” (SCB-05). This last comment comes about as a result of a discussion looking at the archive as a source of specific answers as opposed to a means by which someone might better understand one’s learning in a larger sense; thus the process of learning. Students demonstrate their understanding of the value of the process both within their course and beyond. For example:

So, just like at work, you’d be doing exactly that process. You’d be saying, “Oh, where’s a good example? What references do I need? Who has done this before that I can talk to?” These kinds of questions are all the same things but the archives just give you a different way of doing that. (SCB-13)

“In some cases, there was a requirement to take in the process to determine if you wanted to look at the product and in some cases there was no process. It was just “here’s my file” (SCB-12). “There were some cases where the process is actually the gateway to the product” (SCB-12). Along with this point about process and product, students talk about better ways to make the artefacts in the archive easier to discern:

So a link might have been embedded in a blog post so I read the blog post and then I would click on it to get the product. It would also depend on, when the person uploaded the file, if they had anything to say. Some people just uploaded

a file and said nothing. So it goes directly to the products. And then there were others that had something to say, “It’s been a great experience” or “I’ve had a few grey hairs” or whatever. “And here’s my product. Hope it helps everybody.”

(SCB-12)

An understanding that process is part of one’s learning also comes out in a variety of ways:

So the process in – [using] the archive... was good. It’s value added... So here’s a great example: try it. People may be talking about using archives but here’s another example, so try it. To me those are a great value added process pieces....

I think you learn a lot from those layers. (SCB-13)

There is a discussion in the first iteration of this study dealing with the value of the archive and why one would use it. There is an added piece about the expediency of just asking someone for assistance as opposed to spending time looking into the archive. This leads further to a conversation about the value of the process of spending time looking through the archive (the work of others), and how value can be obtained as a result of the time spent doing this. “I was able to look at some samples provided by previous students in the archive and better shape my direction.... Having the archive to see what others thought before you is a great way to do this” (SCB-09). “I would guess that any archive or search that already resembles a personal way of finding sources, would appeal more to learners” (SCB-05). “I’m looking at the process and, for the most part, went skimming through to see how their conversations went. To see what their rationale or understanding for some of the responses were” (SCB-15). These comments end up being common in both sections of the course. As the course evolves, these “value

– process” comments increase and student understanding of the value of the archive is articulated quite clearly. “You’re drilling back quickly and hopefully finding the right source, the right example, a bit of context, that you can just quickly learn from that and then plug it back in at that moment” (SCB-13).

For many students the process of accessing the archive was overly onerous; for some a great challenge. “I too like examples of previous assignments, but am having trouble finding all of the documents you listed above by using the search. A direct link is helpful, but may I ask how you found them” (SCB-12). In both of the course iterations students initially struggle in their process of finding value in the archive. In both iterations, early on in the course, I offer a synchronous session to show students how to use the archive and to look at different ways to search and to share the information that is contained in the archive. In doing, so we talk about the reasons why one might search through the archive and that, depending upon the reason, the search might be different. Students subsequently speak about their processes and how this changes as a result of this assistance. “I tried going through them myself but found myself overwhelmed enough just trying to keep up with the current [examples]. The ones you have selected are a good sample” (SCB-11). “Thanks, I hadn't thought about listening to the previous sessions. Great idea” (SCB-07).

The idea of rating content within the archive also came out of this process conversation. “I think that the idea of ‘rating’ student work -- even the discussions is a great concept -- kind of positive -- what postings or assignments students found most helpful. It would act as a guide to others” (Anonymous). “Yes I was thinking that professors may grade assignments but students may also want to leave their sense of how

useful someone's article was to their own work or learning” (Anonymous). “The ‘good stuff’ will always stay alive as long as it is needed. When it is no longer needed it won't be important enough or popular enough to stay alive” (Anonymous). “I found the archive very useful. I would say that a favouriting or a rating or view count feature and the ability to search based on these would be extremely useful” (SCB-22).

In later evolutions of the custom Elgg platform, a “likes” option has been added, to allow users to publically affirm the value and show appreciation to the contributor. This final quote shows just how students take their classroom experiences, apply them elsewhere, and then are able to circle back to their learning:

I was also thinking as I strolled through an Art Museum yesterday that was filled with art students sketching the paintings on the wall. No doubt they were influenced by the way these now past painters, whose work is housed in this fine arts archive, but likely their instructor thinks it is for the best. They probably argue that this imitation allows, doesn't repress the learner's creative juices!!  
(SCB-18)

Process as a value piece of the archive is one of those elements that speak to the thesis of this study. Student comments bring forth the ideas inherent in organizational knowledge creation when they talk about the bringing together of ideas from their peers, and also as they are able to connect the intrinsic value of the archive to other aspects of their learning. As the novelty of the idea of an archive wears off, students will just expect to have an archive and make use of it throughout their learning process. In this respect I refer back to the following comment. “I would guess that any archive or search

that already resembles a personal way of finding sources, would appeal more to learners” (SCB-05).

***Value – Rich Resource (n=67)***

“Value - rich resource” is the third most frequent value subcode in my study. Although many students indicate that they see the archive as a rich resource, many also do not go further and explicitly state why. This aspect of why the archive is a rich resource is more alluded to in other things that are stated throughout the discussions. Reasons why the archive is seen as a rich resource need to be drawn from the surrounding conversations. “I have accessed the archives and hope to do some reading and see if they give me any ideas, I think they will so... Yeah for the archives!” (SCB-10). “I think the Archive has great potential for future learners. The posted assignments are a rich resource in guiding them through some of their own projects” (SCB-09). “I really appreciated past postings and I will make sure to post my assignments also for others to peruse” (SCB-10). “Because this subject was quite foreign to me, the assignments completed by previous students were invaluable providing ideas about budgets and strategies and format” (SCB-20). This is only a small sample of these types of rich-resource comments, but these examples do serve to amplify support for the value of the archive.

The following comment from a second iteration student very clearly articulates an understanding of the value of the archive and the learning environment as a rich resource:

Use of The Custom ELGG really made me think about sharing resources and standing on one another’s shoulders in order to advance all of our knowledge. I think this trajectory is essential as more and more knowledge is constructed. We

do not all need to start at the same place—instead, we can connect in order to build upon the work of others. (SCB-17)

Students attempted to compare the Custom Elgg environment to their previous experiences with the LMS (Moodle). I discuss this comparison in more depth in the challenges area; however, the following rich resource comment brings the environment and the archive together. “I’ve tried to focus on the positive aspects of the Custom ELGG, rather than continually comparing it to my previous experiences with Moodle. I like that it is rich and complicated and chock full of stuff” (SCB-18).

One particular individual is challenged by the idea of having access to this rich resource as opposed to learning by going off and figuring things out on their own. For example, the following comment is part of a series of comments where this student talks about using other online resources to find assistance in their learning, but in the end they see the value of the archive:

It is great to be able to see other’s assignments, particularly when their grade and the prof’s comments are still attached. It seems particularly helpful when you need help either understanding an assignment, or it’s not your area of expertise, or you just want a nudge in the right direction.

I hadn’t written anything scholarly in 20+ years. The panic was overwhelming. I "googled" my brains out, looking for assistance. I couldn’t find any examples of exactly what I was going to be writing. At the time it seemed tragic. But I got through it. It was agonizing and slow and I was full of self-doubt. But it was all mine. I got an excellent mark and was more excited about it than I thought possible. It was exhilarating.

I wonder if my experience would have been the same if I'd had the Archives then. I would have found all sorts of exact examples of what I was supposed to write. It would have reduced my anxiety, but I doubt I would have had the same learning experience. I suspect I would have modeled my paper just like one that had received a high mark. Not a lot of original thinking – just following someone else's well-conceived path. (SCB-18)

This learning challenge seeing value based upon the work of other is threaded throughout the data in this study. This same student articulates the most common sentiment. “I also believe we're much better off for having the archive. Assignments aside, I feel there is much to learn from past students' 'conversations'. It's fascinating. And time consuming, but time well spent” (SCB-18).

Students are able to see how the archive, this rich resource, can enhance online learning. This is articulated as, “Instructors in traditional face-to-face courses are able to provide examples in a classroom environment, but this may not always be more difficult to do in a DE environment. I believe that providing an archive is an excellent way to do this” (SCB-21). These ideas are repeated in a variety of ways, including seeing the archive as a multi-level resource offering support from different perspectives:

Once the archives have been located the plethora of information is absolutely amazing. I particularly like the fact that former students have posted their work for others to have a look at. This to me is really cooperative learning. Why do you have to invent the wheel every time when you can add on and give others the benefit of your experience? (SCB-11)



From my experience with the course that you're doing right now, I really enjoyed when people shared stories. I think that really brought me in and made me feel like I needed to learn in order that, if that kind of situation happened to me, I'd have the experience. It was like I had a whole bunch of teachers instead of just one teacher. (SCB-22)

“We do not all need to start at the same place” (SCB-17). How does this show a rich resource and better yet, what is the real value of the archive in light of this “rich resource” subcode? The richness of the archive lies in the diversity of its content and the many ways that individuals can approach this resource and make use of it. It would be wrong of me to assume that student groups come at their learning from the same place. Therefore, if we know that there is this multiplicity of inbound learners then can it not be fairly assumed that their learning needs and abilities are equally spread out? The richness of the archive as a value proposition should therefore not only speak to this diverse group of learners but it should also grow proportionately to its perceived richness.

***Value – Personal Learning (n=36)***

Students speak about the impact of the archive on their personal learning with similar vigour as they do with other value sub-categories; thus the creation of the “value – personal learning” subcode. “Learning through reviewing others’ assignments is new and unfamiliar to most, but it works” (SCB-20). “Yeah, it helps in the learning phase to actually look and see what others have done” (SCB-15).

[The archive] has more power but in many ways is just one of many potential influences on one's thinking. By glimpsing the works of others and maybe be

inspired - even if it doesn't get terrific rewards, it may be a greater learning experience?? (SCB-18)

The value attached to learning by using the archive is as much about the process of using it as it is about finding appropriate items to assist in their learning. “I personally like the archive, it allows me the opportunity [*sic*] view other work and reassure myself that I am on the right path or that I need to later [rethink] my plan of attack” (Anonymous)”

Searching for files in the Archive [proved] to be one of the most useful features of the Custom ELGG, as looking at previous business plan has helped me think about how to organize sections of the business plan I [was] working on. I find this to be especially important in a DE course. (SCB-21)

“When I stop obsessing on the assignments, I can see that the archive does provide inspiration, and an opportunity to learn from my student colleagues in a unique way” (SCB-18). This quote is an example of one of the few codes defined as *simultaneous codes* discussed at the end of the previous chapter. This particular statement covers a variety of issues from learning to efficacy and sharing, and serves as an example of how some of the participants are able to extend their understanding of the archive.

The learning process can impact a group or organization as well as the individual. As quoted in part earlier in the third chapter, “Knowledge creation is a continuous, self-transcending process” (Nonaka, Toyama, & Konno, 2000). Student reflections as noted in this sub-category are very much a case of self-transcendence. The learning gained from this process is only a part of the larger and continued learning experienced in this

environment. Students begin to understand that there is a process that can help them, and that this process leads to the use of the archive aids in their personal learning:

I just feel from a personal learning perspective, if I was looking at the previous archive first, or as part of gathering the information, I think I would find it very disjointed. But doing the reading first and or looking at some of the other questions first, and then accessing the archive material to say, “Well, let’s think of a different example or another approach or how did they work their way through this theory to have a better understanding of it?” That’s how I would best use it, right now, anyway. (SCB-19)

***Value – Perception (n=34)***

The “Value – perception” subcode is created to capture how the research participants perceive the value of the archive. I want to capture their general conversations about the archives value. I feel that this subcode has merit because it provides a window into student perceptions which may have changed or altered throughout their time working within the course and the archive. Ultimately what is the perceived value of the archive? “Is the archive valuable? Absolutely. But it’s only as valuable as people who want to take a risk and put it out there” (SCB-11). “So I do appreciate the archive. It is a wonderful resource and it is very helpful reading the work of others. But I’ve learned for myself that I have to step away from it too. (SCB-18). “For the archives to add maximum value, there must be an efficient and effective way to evaluate what you are looking for when you go through them” (SCB-04).

The idea of perception of value in the archive in many ways deals with what students believe is in the archive. For example, one student expresses their support for

the archive, yet they bracket their support with concerns over time, as well as an interesting perception of those who contribute in the past:

I think time becomes a quintessential piece of the puzzle. I did initially review the discussion threads and thought there were some interesting comments but keeping up with the 30 odd students in my own cohort leaves little time to reflect on what ghosts have said. (SCB-15)

This ghost comment sparks an interesting set of discussions among the students in the course. I am perplexed by the use of this term and whether it speaks to the perceived value of the archive as a place containing rich items to assist in the learning process, or the focus is shifting to include the value of the author of any content within the archive. I discuss the author issue later on in the “challenges” subcode; however, looking through the perception lens, participants worry about who contributed in the past as much as how their contributions will be perceived in the future:

This person spoke at length about context and the worry that things that were said and understood today might be seen differently in the future and thus taken out of context. If I post something today, the people in the [current] CRS group get to see it. If I leave it there for the next time round, who’s in [that] CRS? (SCB-15)

Perceptions (negative or positive) become an issue at various stages in the use of the archive. This perception is shaped by how they view their peers and what can be done to search the archive for value based upon cues found within the archive similar to those found elsewhere in life:

People look at people and they're going to make assumptions and they're -- maybe incorrectly, but they're going to be quickly looking for people that have common interests, that are really engaging, that are -- that have lots of applicable content that's real interesting. So I think you're looking for those cues in the same way in an archive. (SCB-13)

These perceptions of value also surface as students begin to recognize what might be found in the archive, how it can be used, and thus its value:

You may not find somebody in your particular section that works in the same environment that you do but you can find somebody in the archive that probably has and you can find some similar experiences or similar examples. And so [from] that perspective I think it's extremely powerful. (SCB-19)

***Value – Future (n=26)***

I create the “Value – future” subcode to capture comments specifically directed at placing items in the archive for the future. In other words, students consciously and deliberately are talking about putting their artefacts into the archive for students in the future. “I am placing my CRS completed business plan assignment here for others in following classes to use in reference to their own assignments” (SCB-10). “I feel fortunate to have the opportunity to review work by past students so I will contribute as well. Hope my work can help others” (SCB-02). “I have chosen to upload it to the archive because the more examples people have the better the next group of projects will be. I think that it is important to share learning” (SCB-11).

The overall tone from those who embrace the idea of contributing to the archive for the future is, “Hope this helps someone else” (SCB-25). Many of the comments with

this “future” subcode are variations on, “Here is my marked assignment #2” (SCB-11). Simply put, these individuals appear to get great value from the archive. They jump in by placing many examples of their work, at times along with comment and suggestions, for those who might be reading their work in the future, or they just add “here is my assignment”.

***Value – To Help Others (n=23)***

The subcode “Value – to help others” deals with both learners helping their peers in their current course, as well as learners either getting help from the archive or seeing the archive as a place to offer help for future learners. Aspects of this subcode could be folded into the “future” subcode; however, the conversations make specific reference to helping, so I am keeping this as a separate subcode. The following quote is prefaced by a variety of comments dealing with the main course assignment and then simply follows by “Hope this helps someone else” (SCB-25). The idea of using the archive as a vehicle to help others build their understanding and develop new knowledge is most prevalent in many of these comments. “The archives can assist exploration, critical commentary, and collegial support through posting our work” (SCB-25). This last comment, tied to the issue of assistance for others, also suggests that the archive may be both a consumer of time as well as a saver of time:

After having used the archive, I feel the need to put all of my assignments on, for they could potentially help others to develop theirs. This co-construction helps people to take the first hurdles (well, it helped me: what are we supposed to do? Am I doing the right thing?) [Having access to the archive] offers more time to really focus on your own project. (SCB-05)

***Value – Current (n=19)***

The “Value – current” subcode captures comments dealing with the use of artefacts by peers in the same course iteration, but in so doing it also recognizes the dual purpose of these artefacts and how they might be used in the future. I recognize that in any online course without an archive, peers can share their existing work, and this does occur. In the use of these artefacts in the present, however, students view them with a more critical eye. “Thanks for sharing your excellent work with us. This is a great document for the archives” (SCB-25).

The relationship between getting support through the work of one’s peers as opposed to the work posted in the archive is at times blurred in the discussions. Indirectly, I see that students look for a balance between what their peers offer and what can be found in the archive to assist them in their learning. “I have had the chance to read several posts made by classmates (all very helpful), and looked through past assignments on the Archive” (SCB-01).

***Value – Limited (n=19)***

The “Value – limited” subcode is one of two areas where I place overtly negative comments suggesting that the archive did not work. In this “limited” subcode, students have different reasons for their less-than-positive views despite being pushed by their peers to see value. “Did I find [the archive] of use? Not really. I used it a few times to get an idea but I did not find other people previous assignments much use to my scenario” (SCB-01). “I don’t think that everybody’s really going to buy into the idea of the archive [because it is disorganized]. I think that people will use alternate methods to solve their problems and communicate” (SCB-14).

In several instances the limitations in use and/or value have to do with a perception about how one learns and what one needs to do in order to build a product (an assignment) and be proud of it. This one example is a variation on several similar examples that will be discussed in the “Challenges – plagiarism” subcode later in this chapter. This student is not talking about plagiarism, although the student is very concerned about their personal process of learning and knowledge creation. I find this an interesting view. The ideas in this comment are not followed up; however, I think this line of thinking is worth pursuing beyond the current study:

For this course, I have spent some time in the archive, and read other students’ papers. And I did find some great examples. I was tempted to print out the excellent ones, and fashion my paper along their lines. But then I stopped. What was I really learning? I was cheating myself out of the pleasure and pain of original thought. So I didn't print them out. I sat down and started writing. Whatever my mark will be, it will be all mine. (SCB-18)

Some learners are challenged by the archive’s value in terms of the limits of its structure. “The concept of the archive, however, [*sic*] is a very valuable one, but I do not feel that it has been executed as well as it could be if it is to be used for learning purposes” (SCB-12). This comment deals mostly with the difficulty in searching the current archive. Others speak about the content of the archive being a form of a limitation:

I also worry that the archive will become stagnant as ‘all the answers are already there if you look’. People will not feel the need to add their own interpretation of the readings or share their own experiences from life. (SCB-15)



This is a challenging comment in that this and possibly other students might believe the archive has a limited life as a result of a finite set of answers. This type of thinking might suggest that in order for the archive to offer value, the types of assignments might need to be changed such that the assignment does not completely provide the answer, or that it is never completely answered, allowing for future learners to learn yet be pushed to go further. “If the resources are not fully up to scratch to the philosophical or knowledge edge of the individual accessing them, those resources or archived knowledge nuggets risk being rejected after some time” (SCB-05).

Out of all of the study participants, there is only one participant who repeatedly talks about the limitations of the archive from the perspective of it being a waste of time. This individual appears to only see the archive as a place of answers to very focused questions. He appears to believe that answers to questions can be far more expeditiously answered by sending someone an email or by picking up the telephone to ask someone a question. He sees only limited value in spending any time in the archive:

There’s a couple of different things that are working against the archive. You don’t have that human interaction so you don’t get to phrase your problem in exactly your own words. It’s much easier for me to email somebody in my class and just say, ‘Hey, I’m not understanding this, do you have any wisdom or advice or do you have any helpful hints?’ And that’s such an easy thing. Even if you find something in the archive that is to do with your subject or your problem, it may not answer the problem how you want it answered. So essentially, you’re doing twice as much work for the same amount of information. (SCB-14)

I interview this individual and ask a variety of questions about his views. His comments above best express his thoughts. I do not know if his views can be seen to be unique or whether they could represent a larger part of the student population. The size of my study is not large enough to deal with this issue. I have included this view as an anomaly in my study, as no one else spoke in such a focussed “Value - limited” manner.

***Value – Beyond this Course (n=17)***

The “Value – beyond the course” subcode comes from answers to questions I pose both in the general discussion area and, more specifically, in interviews about the value of the archive in areas beyond what students see in this course and/or similar courses. These issues are answered in different ways. Students begin to see the archive in a different light as they think through its value beyond how they are currently using it. “I think it’s really cool because all of a sudden you’re leveraging more than the textbook and the prof. You’re leveraging more than the students of that one class” (SCB-13). “I could probably go back into the archive for whichever classes I can get access to [and] if there’s some that are open, and take a look at some of this stuff. It would be fantastic” (SCB-19).

Students seem to open up to other ways of viewing an archive, its content, use and value. The following comment sums up many of the ideas in this study and can be used as a quotation to support a variety of the identified codes. This comment also links to the literature on reflective practice, personal efficacy, and knowledge creation. It shows how students embrace the idea of the archive. There are similar comments; however, the words of this student most clearly amplify the point:

The open sharing of the archives and the submitting of our works, is a way for students to "help themselves" -- for the more they read, search, and reflect -- the further they are likely to learn how to discern. I think learning from others' mistakes is valuable -- saves time and repetition and frustration. Learning from exemplar documents helps too -- as it sorts out quality paper writing, thinking process, and hopefully more effective learning for future students. (SCB-25)

***Value – Changed Over Time to Positive (n=14)***

I create the "Value – changed over time to positive" subcode as I observe students comment about the archive, initially in a less than enthusiastic way but adding that their views change. I find an interest mix of reasons in the few examples coded. "I am no longer looking into a sea of darkness when thinking about social networking sites as I now have what I feel is valuable experience using one in the Custom ELGG" (SCB-14).

This subcode can be rolled into the perception subcode. I think this issue is primarily a student perception of the archive that changes. This change appears to come about as a result of seeing value through use, through being supported by one's peers, and being willing to persevere in the use of the archive. "When I first started investigating the archives, it was to use it for my assignments – how can it help me get a good mark, or meet the deadline. I didn't really think of it from a bigger perspective" (SCB-18). "My experience in [this course] has changed my mind about social networking sites" (SCB-14).

Many of these comments are generally not supported with very clear reasons for this new perspective of the archive. Persistent use, however, appears to be a factor in support of this changed view:

There's some courses that I thought, "do I have to post another discussion board? I can just read my stuff and do my stuff, and I don't even really need to be in a class. I just felt that when we started [using] Custom Elgg. But I don't know whether it's my brain has switched over or just this course happened to resonate really well. I'm a convert, that's for sure. I wouldn't have said it before. (SCB-19)

***Value – Exciting (n=12)***

"Oh, man, look at what I've done! Look at where I started and look at where I am now! This incredible journey, to have gone through this and come back and recognized that it really isn't about the A [grade]" (SCB-11). This comment is part of a summary response this student makes with respect to the course and the use of the archive. This individual is one of the more outspoken members of my study. Her comments continually show support for the archive as a place to obtain value and within which to place one's work.

The "Value – exciting" subcode is created to capture comments that show the level of enthusiasm and excitement for the archive and the socially networked learning space. The comments are not particularly overly effusive, yet they do show a consistent level of appreciation and understanding for the value of the archive. "I think the idea [of the archive] is very powerful and very much inline with the concept of a learning organization" (SCB-13). "But certainly [the archive has] been great this semester, although with some navigational hiccups. (laughs) It'll get better" (SCB-19). "Yes, I regularly visited and searched through the Archive. It is my favourite part of the Custom ELGG" (SCB-18). "[The archive?] This was one of the best things about this course. I

used it over and over again” (SCB-11). This subcode, albeit a less used one, is important to show the very positive response students exhibit regarding the archive and the socially networked learning environment.

***Value – Personal (n=10)***

The “Value – personal” subcode is again one of those codes that could be spread out among the other codes, yet there is something about the student comments that cause me to leave it alone. Students speak about how the archive helps them and how it shapes their understanding of the course. I see this as a very personal value for the students. “I have to say what has really saved me is the archive because I get a better sense of what should be happening. I had a terrible time trying to find it but now it is a real treasure” (SCB-11).

The following quote comes from a student who speaks at length about the archive and its impact on learning. “The archive was definitely a surplus for my own learning” (SCB-05). This student uses words such as relevant, co-construction, and how the archive helps “me proceed with my own learning process” (SCB-05). This lengthy conversation deals with the intrinsic nature of the archive and its value to the learner. Others express this sentiment as well. “I also believe we're much better off for having the archive. Assignments aside, I feel there is much to learn from past students' 'conversations'. It's fascinating. And time consuming, but time well spent” (SCB-18).

***Value – Alumni Support (n=7)***

This very infrequently used subcode; “Value – alumni support” is created to show the impact of alumni joining in the conversation. Students from prior iterations of the course are encouraged to drop in and follow along with current conversations, and are

free to join in as and where it is felt appropriate. The idea of this additional contribution is to add a different dimension to the archive and to attempt to give a more personal voice to some of the artefacts left in the archive. There are no negative comments regarding alumni in either of the two course iterations:

I was really pleased when a CRS alumnus dropped in with her resource. It was a generous and thoughtful reaching out. I believe I will keep myself in for the group discussion and follow as able. It will be both an interesting reflection and likely refreshment of the material covered in this degree looking at it through the eyes of an incumbent. (SCB-02)

The few alumni who take the time to drop in help to push the conversation towards the archive. Each alumnus seems to have tips and suggestions that are well received and spark further discussion. “Hi everyone: I was in the last CRS class and if there is one piece of advice I can give you that will really help with this assignment is...” (SCB-11).

***Value – Scaffolding (n=2)***

A scaffolding conversation is limited to only a few students. The reason for keeping this specific subcode, albeit one with so few references, is that it is meant to show the great variation in ideas and understandings the students have about the archive. For example, the code “Value as a scaffold” is part of a unique conversation with a student in an interview at the end of the course. This student struggles to explain in this quote:

I think the archive provides an excellent mechanism. It's not exactly scaffolding but it almost is, if you're kind of looking from a learning perspective is that the archive is a piece of scaffolding that's there and if you're getting kind of constructivist learning you kind of -- instructors are going to access or use scaffolds differently. I think, based on what I can hear and see from people in the course, people did use it and reflect on it differently. (SCB-13)

Although this particular research participant uses this scaffold phrase several times during the interview, few other research participants use these words or speak about the nature of the process of scaffolding in this manner. I ask this particular individual about their understanding of their use of the term. This individual speaks about the physical structure of the archive and how by seeing it as a form of a scaffold, learners use it as a device to move through to other knowledge. This is articulated in the following manner:

I think that -- employing that same kind of context of a scaffold is that you try a scaffold the one way and it doesn't work that well and you kind of keep changing it to get it to be that -- the ladder that you're kind of hoping it to be so that -- students use it in the way that you may think to climb that obstacle, or whatever, but they -- hopefully even if you got there in ways you don't think, but I think that definitely the way it's now sitting, needs some adjustment. (SCB-13)

Although in many ways this language and use of the term scaffold is unique in the overall set of student conversations and should not be used to define a pattern, I feel that the data shows similar singular or limited descriptors that can help begin to outline or frame an understanding about the use, value and challenges of the archive.

One of the many things that my reading and this research project has taught me is that we have so many different understandings of the term scaffold. As students use the term scaffold, it appears to refer to a device used to assist in construction. “I used the archive on several occasions to find relevant files, posts, pointers that I could use as scaffolds to help me proceed with my own learning process” (SCB-05).

The one individual who focuses on the term scaffold and uses it to try and explain their understanding of the archive works hard to explain his understanding:

[The archive is] not exactly scaffolding but it almost is, if you’re looking from a learning perspective is that the archive is a piece of scaffolding that’s there and if you’re getting kind of constructivist learning you kind of -- instructors are going to access or use scaffolds differently. I think, based on what I can hear and see from people in the course, people did use it and reflected on it differently. So at the macro level, it gave them an opportunity -- or all of us -- and, especially for me, a great opportunity to see what could be used. Because I think [the archive] was one of the -- I think I’ve had some similar experiences with [an archive] but I think [this archive has] got to be one of the clearer versions of that, ‘cause you were involved. You could prompt the questions throughout the course and [the archive] was well connected into the course so, definitely, yes, [my view] changed -- and definitely for the better. And I definitely saw [the archive] as a form of scaffolding. (SCB-13)

### ***Value – Summary***

Seeing value in the archive through these various sub-coded categories helps to frame its usefulness as a supporting element for knowledge creation in an online learning



environment. Additionally, many comments provide support for reflective practice as a means of helping to solidify one's understand of the course material. At one level there are so many "value" subcodes that finding a way to discern value from this conversation becomes a challenge. There is, however, an overall message around value. Threaded throughout these comments students speak at length about being supported in their learning by the archive; a living structure that they have an active part in shaping. As well, there is a recognition that they are also being shaped by the archive in the process of their engagement with it. The value of the archive does not appear to rest with it being a static device, but it being an entity that grows and evolves with the students throughout the process of their learning.


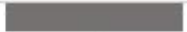








### **Challenges With the Archive**

During the process of gathering data throughout the two course iterations, I initially come away with an anecdotal impression that many students are overly challenged by the archive. As an active participant in their course initially, I cannot help feeling that students are just not interested in the archive, have not given sufficient time and energy to benefit from it or they see the whole idea of the archive in a negative way. I feel that the overall conversation is hijacked by this sense of negativity and what I feel are challenges to the whole idea of an archive in a course. My after-the-fact analysis of the data proves this impression to be very wrong. Fortunately this helps to diminish my sense of this negativity and reaffirms the value of this data and the idea of an archive as having value.

My data clearly outlines a variety of challenges. Having repeatedly worked through the data, I realize that what I mistakenly perceive as negativity is, in fact, a very

public working through of a new learning environment, and a demonstration of students attempting to appreciate how such tools in this socially networked environment can benefit their learning. As I code the data with my “challenge” subcodes, as outlined in Figure 6, I realize that there are specific issues dealing with the archive in terms of accessing it and what it contains. I also realize that there are more issues dealing with how the archive helps to change student views on the process of learning and how these views begins to change their personal efficacy. More than anything that I see revealed by this study, my understanding around efficacy helps me to understand the impact of the use and value of an archive.

Figure 6: Challenges Subcodes

Code	Total	Bar Graph
Challenges: personal efficacy	79	
Challenges: navigation	51	
Challenges: time	29	
Challenges: custom elgg	26	
Challenges: LMS vs SocialNetwork	27	
Challenges: negative	16	
Challenges: the content author	14	
Challenges: Plagiarism concern	11	
Challenges: solutions	12	
Challenges: hindered learning	8	

My choice of subcodes is discussed in the following sub-sections of this topic. As with some of the already discussed subcodes above, I outline why I retain some subcodes that otherwise might have been subsumed into other places.

#### ***Challenges – Personal Efficacy (n=79)***

I create the “Challenges – personal efficacy” subcode in reaction to comments about how the archive impacts student perceptions of learning, their interaction with the

archive, and the value they attach to the process of working in this socially networked learning environment. As part of the reflective exercise at the end of the course, students are asked if they feel that the course experience changes their own sense of net efficacy. This question opens a wide set of conversations about efficacy. These conversations are captured under the umbrella of this subcode.

Students speak about the impact that the tools and the environment have upon their learning. I use this personal efficacy subcode to capture both positive and negative aspects of efficacy. “I believe that having the opportunity to utilize and explore [this environment] was a valuable learning experience. Having the opportunity to use a variety of different social media tools has greatly increased my confidence and knowledge of online learning” (SCB-03).

In many ways this personal efficacy section is a lynchpin topic in my study as a result of the way in which the use of the archive within a socially networked learning space impacts an overall sense of understanding and value around the process of learning. For example, the following comment serves to show the impact of the archive on this individual’s ability to use it and see value in its use:

I did search through the Archive to find samples of other assignments. I found this very useful. It was also kind of comforting to know that this resource was available if I needed to see how other students approached a certain topic. I think this was my favourite part of the Custom ELGG and would be the main reason I would consider using it again in the future. (SCB-06)

I originally create a “Challenges – positive” subcode, which is developed from reading student conversations where they speak favourably about their use of the archive.

As I revisit these coded pieces of text I realize that these comments can best be subsumed into the “personal efficacy” subcode. This becomes quite clear in the following simultaneously coded example: “When I stop obsessing on the assignments, I can see that the archive does provide inspiration, and an opportunity to learn from my student colleagues in a unique way. I’m glad we have it” (SCB-18).

An interesting conversation that repeats itself in both of the two course iterations is that of leaving items behind in the archive with marks attached, or even including professor’s comments. Some of the course participants willingly place their documents in the archive with marks and comments, while others choose to only place uncommented items. Personal efficacy appears to play a part in these decisions. The following comment is from an individual who posts their assignments in the archive with marks and professor comments included. The comments suggest that by sharing her struggle in this way she benefits as much as others who read her paper:

That’s where the learning is. The learning isn’t in looking at an A paper. The learning is in looking at somebody who hasn’t done an A paper and got to the end of the course and got an A minus. Okay. That’s the process. (SCB-11)

This student is very vocal about posting her work, as she indicates “warts and all”. She is one of those who return as an alumnus in the subsequent iteration of the course and speaks at length about the value of the archive as a place of learning. This experience changes her perception of the learning process and impacts her personal efficacy:

In my entire undergraduate work, [I] never got an A. I... was so focused on the A that I missed out on the process. I am not going to do that again. Because I missed out on the process... when I got to the end, I thought, ‘Oh, man, look at

what I've done! Look at where I started and look at where I am now!' This incredible journey, to have gone through this and come back and recognized that it really isn't about the A. (SCB-11)

Other students speak about the issue of posting assignments with or without marks included, and in doing so these students show aspects of efficacy in their discussions. The following student does not subsequently indicate whether the artefact contains marks.

One of the things that demotivated me from showing my marked papers was hearing that other students did not do as well as they expected. I did well and, in a sense, I felt that putting my assignment in the blog would be equivalent of bragging. On the other hand, having it there for future courses to use as a guide in their own development I think is a great idea. (SCB-09)

The above comment also points to our inexperience with openness in formal education. We do not want to show our failures or our warts nor do not want to be accused of being braggarts. Our sense of appropriate behaviour needs to evolve with continuing access to accessible and pervasive artefacts.

Personal efficacy surfaces in a variety of ways. For example, "while I loved having the chance to see others' assignments, I worry that it robbed me of learning something myself" (SCB-18). "Using the Custom ELGG has made me appreciate the value of using social networking to enhance interaction in a course" (SCB-21). "[The archive] has stretched me to learn and be open to new experiences. In some ways it has made me feel "stupid" because I don't get how to be as engaged as I would like to be"

(Anonymous). “I’m really not willing to share this with future [learners] just yet because I’m feeling so completely ignorant right now” (SCB-04).

One of the interesting aspects of comments such as these is that these same individuals come back later with comments that show just how their perceptions change and how the process of accessing and using artefacts from the archive really benefits their understand of the learning. These comments do, however, come with a degree of reticence:

I still struggle with the "guilt" of peeking into the assignments and discussions of others. Intellectually I understand the value ("we stand on the shoulders . . .") but I guess my educational/practical background has made this feel awkward. I think that I will probably use the archive more at this point, now that I have finished the course. All in all, a very helpful experience. I look forward to staying connected to U though the Custom ELGG. (SCB-19)

As a final piece on the issue of personal efficacy I think this last comment really sums up student understanding of the archive. “These [synchronous sessions were] beneficial but what really pulled my a\*\* out of the fire were the archived assignments” (SCB-11).

### ***Challenges – Navigation (n=51)***

One of the more challenging aspects of the archive comes down to how to navigate to the archive and once the archive is found then how to find what is perceived to be of value within it. “I hope this is not a stupid question but where do I find the archive?” (SCB-11). “The link you posted takes me to the home page - is that where SCB-27 posted his response? I couldn't find it” (SCB-04). This “Challenges -

navigation” subcode helps to demonstrate the value of structure and design and how barriers are created as a result of navigational challenges. The data shows that through reflection at the end of the course students are able to see value and benefit. “I have to say what has really saved me is the archive because I get a better sense of what should be happening. I had a terrible time trying to find it but now it is a real treasure” (SCB-11).

There are many individuals who are challenged by this “I don’t know how to find things” aspect of the environment, as well as a perception that the environment is just too thick, there is too much material, and thus the archive is unnavigable. “I personally am starting to find this a little overwhelming... mostly with the navigation thru it” (SCB-01). “I would say that I think the problem stems from the fact that there is almost too much information, and when you’re swimming in an ocean instead of a backyard pool, its much easier to lose your bearings” (SCB-12). “One of the problems identified by some of my colleagues was that it is often difficult to find materials in an archive because there is so much material to search through” (SCB-14).

Navigation also seems to include recognition of the process involved in finding items, yet the challenges of this process appears to have not been lost on some. “I much prefer distance learning but also appreciate a clear visual path to follow as opposed to a search [and] discover method” (SCB-01). “It’s serendipitous when you find something you weren’t expecting to find, as long as it’s what you want. But if you find all this stuff you don’t want, then it’s kind of a time-waster” (SCB-12).

This navigation subcode in many ways overlaps with the “Challenges – solutions” subcode. As students talk out their difficulties and challenges, some also add suggestions and different ways of navigating to make the process more efficient. There are

discussions about the use of tags and other linking devices such as bookmarks, as well as the “like” or “recommend” system in use by large public social network sites.

Suggestions for making access better and navigating the system also include the element of cost/benefit:

I think their needs to be a success rate for the one going through the [archive] if I only need to read three posts to get to a content nugget that is useful for me, I know I will keep looking. If it takes me 30 posts to come to something useful, chances are I will no longer use it as a learning tool. (SCB-05)

Students demonstrate their understanding of the value of the archive but access to the core of the archive continues to be an impediment:

I very much like the idea of being able to access the knowledge that previous students generated - however [*sic*] good access means good interface design to the course pages. Otherwise, it's like trying to find a needle in a haystack. (SCB-04)

For those of you blissfully unaware, [this course] moved class discussions out of Moodle and onto a group page in the Custom ELGG. What a wonderful idea; knowledge sharing. But effective knowledge sharing requires effective methods for storing and accessing that knowledge. This is where I get concerned. (SCB-04)

Students understand that the archive they are using, sharing, and adding to is relatively new and is an early work-in-progress. Navigation and all of the surrounding issues with regards to getting at the material they want access to, although discussed at length, in time becomes a footnote to a larger discussion, and students understand that these issues will be solved:



The "good stuff" will always stay alive as long as it is needed. When it is no longer needed it won't be important enough or popular enough to stay alive. The archive needs to keep up with the technology or be one up from the rest in order to remain useful. The content will always be there, its just accessing it that's the key. (Anonymous)

### ***Challenges – Time (n=29)***

Time spent in and with the archive creates a variety of interesting comments. “I find it a waste of time to search through an archive for an answer that somebody could give me in 5 seconds if I can ask the right question” (SCB-14). This “Challenges – time” subcode covers a variety of time-related concerns and challenges. “I think that the time cost just really needs to be weighed against the benefit of the archive itself and how long that archive’s going to be used for” (SCB-14). This type of comment reaches across other codes such as the use and value areas. The challenge of time as a value element surfaces in many of these sub-coded comments. Note the value, the time, and the filtering aspect in the following comment. In many ways this circles back to the earlier “personal efficacy” subcode. I believe the student is suggesting, ‘I like the archive, it has value, and yet despite this I am challenged by what I must do with my time’.

I also enjoyed reading the previous classes’ discussions. I’m sure there was a lot of ‘good stuff’ in there, but it became an issue of time. It was hard enough to keep up with our own class discussions and readings and assignments without getting lost in someone else’s experience. (SCB-18)

This time/benefit balancing act surfaces in a variety of ways. “I think that reading some of those ideas [in the archive] would be stimulating, but also time consuming for

some of the students, especially if they feel they are swimming upstream already” (SCB-25). The author of this comment is very aware of the audience in making this comment, which is embedded as a part of a much larger posting. This individual is an alumnus from a previous course section a year earlier. She concludes her lengthy posting by adding: “Hope this helps someone else” (SCB-25).

The “time” challenge of the use and value of the archive resonates with students in a variety of ways. “[The process of using the archive] was probably more beneficial to me than seeing answers, how somebody approached this particular problem. I can just see the volume of material, it’s sometimes difficult to get through” (SCB-19). “If you have frustration and you don’t find things quickly, you won’t necessarily re-use [the archive], even though it’s a great resource” (SCB-13). “[There is] the time cost of searching through the [archive], or searching through any archived information, at least the way the Custom Elgg was organized, it was too unorganized for me, in order to be of real use” (SCB-14). Yet despite this apparent time/use dichotomy, some continue to express an understanding of the value of the archive. Others, however, see this in quite a negative light. “[The archive] allowed me to glimpse into how people thought although without having the time to actually go culling through all of the different threads, it’s a little harder to see the big picture of the process” (SCB-15).

It’s just too much process, too much work to get what you want. When you have other things going on in your life, you don’t want to take ten minutes to find one document. It’s too long by today's standards. (SCB-12)

### ***Challenges – Custom Elgg (n=26)***

The “Challenges – custom Elgg” subcode comes about not so much as a challenge to the learning aspects of the custom Elgg environment, but more about how the custom Elgg environment creates challenges in terms of access and use of the archive. “I feel that from my perspective it is the actual Custom ELGG environment [that] is ‘too cluttered’” (SCB-11). “I had difficulty navigating in the Custom ELGG. The idea of using an archive was exciting but trying to find things was very frustrating (at the outset of the program)” (SCB-01). This is a typical comment about the environment. Students feel that there are too many challenges as they try to navigate through this new environment (Custom Elgg), yet over the life of the course, familiarity with the custom Elgg environment lessens these concerns:

Working with some of the frustrating aspects of the Custom ELGG has highlighted that some frustration is to be expected in all learning. However, understanding the specifics of this as an instructor and designer is important, as it must be considered carefully in course design. Many new things have a higher degree of frustration due to the higher number of elements not fully worked out. I suppose this is where design, flexibility and open discussion are also important. In the case of the [archive], having [the researcher] involved and [the professor’s] openness to discuss the weaknesses alongside the strengths where excellent scaffolding and bridges. (SCB-13)

### ***Challenges – LMS vs Social Network (n=27)***

Early on in both study iterations some students express usage concerns about the socially networked learning environment. They use their previous learning environments

as examples of what is more familiar, and in some cases, perceived to be better. “I personally find it very difficult to keep up with these posts/blogs, etc, and do not find this as user-friendly as in the Moodle ‘classroom’” (SCB-01). This is the impetus for my “Challenges – LMS vs social network” subcode. Most research participants change their view over the time spent in the course and working with the socially networked environment, as well as the archive. “I feel it was a valuable experience that made the course feel more innovative than a regular CRS Moodle course would have felt” [CRS is my code word for the course name and number in this research] (SCB-33).

The Moodle versus socially networked learning space discussion evolves and students begin to see just how different these two environments are, and how the socially networked environment offers a different experience. There is an understanding that, just possibly, the LMS is only a step in the evolution of online learning environments and socially networked environments might begin to offer a comparable richness not otherwise imagined:

We wouldn’t be having this conversation if [we were not in] the Custom Elgg. You couldn’t do it in Moodle. You couldn’t have this cross-mixing and you couldn’t bring outside stuff in. I don’t think you can have a meaningful archive -- artefacts or an archive in LMS. I don’t think you can. (SCB-11)

[I like to] think about it from an evolution perspective, I remember [when] Moodle was introduced, I thought this was great. Now, I look and I think, “Wow, it’s so constrained, it’s so structured, it’s really stifling.” I wouldn’t have thought that just a short time ago. (SCB-19)

### ***Challenges – Negative (n=16)***

The “Challenges – negative” subcode does not produce significant numbers of comments. Despite this, I feel it is important to show these negative comments as they pertain to the archive and its use. A variety of these comments can be considered an overlap with other subcodes such as navigation and time, yet some of these comments stand on their own. “I have a tough time listening to recordings of any kind so I'm unlikely to access these archives for investigative purposes” (SCB-04). “It just seemed like we're using the features of the Custom Elgg almost to justify its existence” (SCB-12).

Some of these comments cover a lot of ground in a few words. As with the following comment, there are different negative issues embedded within this statement:

It doesn't matter how many items are in the archive, if nobody can find them, it seems somewhat pointless to have them at all, and if they can be found, how do we separate the good examples from the bad ones? (SCB-12)

### ***Challenges – Content Author (n=14)***

The issue of good and bad examples mentioned in the previous subcode forms part of an interesting issue that surfaces regarding the value of items found in the archive. I capture issues pertaining to this concept in the “Challenges – content author” subcode. The conversations touch on variations regarding who the author is and relates concerns about the credibility of the author. The conversation touches on known peers versus those in the archive for whom no one has an attachment or any personal knowledge. “It doesn't matter who it is, it's just a lot of people found it useful” (SCB-22). Students also speak about the value of what the professor and related known and/or valued writers in

the discipline have to say. “I will [read his posts] because he’s the teacher” (SCB-22). “I found a wealth of information [in the archive] and caught myself looking to the names of the people posting and apparently favouring the ones I had past experiences with” (SCB-15).

If the person who’s made the post that’s 900 days old is an accredited author or something like that, or has done research that’s been published, I’m going to be more inclined to read their work and value what they have to say. (SCB-14)

There are interesting comments about the perception of content. Aspects of the content are at times categorized as coming from a “smart person” or “a high-value person” (SCB-13). This subjective-view offers a glimpse into the culture of the student world and their perception of value:

You’re looking for people that you trust the information from, if there’s people you know from the program that have done something and you know the quality of their work is high, then you may kind of dig down in the archive in that particular area and say, ‘Okay, well, I know this person and they seem to be quite thorough in how they do things,’ so then you’ll be looking for something [they have produced]. (SCB-13)

In addition to the author, there is a struggle to appreciate the contribution of peers (known or otherwise) as opposed to content. The following is a comment I add to the discussion in the second iteration in response to the value of a known contributor.

Despite the possibility that an archive might contain items of value I am beginning to think that the content is less relevant than is the person who made

the contribution. SCB-15's earlier comment using the word ghosts caused me to wonder if there might be an issue with content versus contributor. Does it matter that you do or do not know who the person is/was who made the contribution and/or whether you know/knew of their reputation. Within a group you soon get to know who is who and you decide on the appropriate value of their words and contributions. You decide, from among your peers, who are the experts or the persons of value and who are less so. In making these judgments you then decide whether or not to spend time engaging them or their contributions. (Stuart)

Student conversations about the value of an artefact based upon the author appear to demonstrate an appreciation for both content and author. "I try to go for content, sometimes you find the most useful things in the most unlikely place. I would go by content and not just look at the author" (SCB-22).

The "content-author" conversation shifts to include the idea of rating content based on various value factors as mentioned in an earlier subcode. This last comment sums up what several students in the second iteration speak about. This is the idea that value ultimately comes from current and future use.

[The rating system is] not meant to be something where only the smart guys get the good ratings. It might be somebody else wrote something that just really helped everyone and they get a lot of people are just appreciative of it. Doesn't matter who it was, it just matters that a lot of people found it [and] a lot of people found it useful. (SCB-22)

This focus on the credibility of the author speaks to an aspect of the Custom Elgg that differentiates it from more popular social network sites such as Facebook or Twitter.

The individuals in this university-sponsored site are each identified and authenticated via their student or staff identification and thus, there is an increased capacity for trust and reputation building as people are what they post.

*Challenges – Plagiarism Concern (n=11)*

Plagiarism concerns regarding the use of artefacts from within the archive is, in many ways, a conversation that is broached and then quickly moved past. I capture the few instances that are discussed and keep them as part of the larger conversation with the “Challenges – plagiarism concerns” subcode. This is a topic that appears to be brought into the conversation at the beginning of the artefact/archive discussion. Students and others express concern about the possible impact of plagiarism in the use artefacts from the archive. Most individuals who actively engage the archive understand its value from a perspective of learning and understanding, and learn how to use the work of others as intended by the archive. Any subsequent conversation about plagiarism becomes a non-issue.

A few students continue to struggle with the concept that their work and their ideas are left for others. This is best shown by the following individual who makes this comment in their final course reflection. “I think the archive has potential for allowing users the ability to see what other ideas or suggestions for assignments as well as feedback on assignments but worry about plagiarism of my work by allowing this” (SCB-15). This individual expresses a more reserved approach to the use of a social-networked learning environment, and this plagiarism comment may be an extension of an overall hesitation to be more public or social.



The plagiarism conversation generally moves on to being an exploration into how we benefit from the work of others. The following comment sums up this conversation and provides an example from a student who appears to understand the value of sharing ideas. Plagiarism is not something we should ignore. We need to understand the real value of looking at the work of others:

People can look at the archives, gain a sense of what they're expected to do in the assignment, get some ideas, get some inspiration. My wife's a graphic designer -- she looks at other works to gain inspiration for her new designs. So I think we can do similar things here. These [artefacts] are how [other] students approached these assignments. [It] helps the student work in the assignment and gain a better direction. (SCB-21)

### ***Challenges – Solutions (n=12)***

The “Challenges – solutions” subcode is developed as I read student comments on how using or accessing the archive might be improved. “It would be nice to organise the files in folders to make them easier to find” (SCB-21). “I would say that a ‘favouriting’ [*sic*] or a rating or view count feature and the ability to search based on these would be extremely useful” (SCB-22). Students comment on various forms of tagging as well as the idea of “thumbs up” or other forms of visual rating, and how these might offer better access to items on the archive.

These conversations bring in outside examples such as the way Google returns items in a search or how Netflix rates their movies. As of the date of the writing of this dissertation, all of the above issues noted by the students have been addressed and implemented as ongoing features of the Custom Elgg environment.

Students also acknowledged the value and the potential in the archive yet recognize that “the good stuff” might be buried out of reach:

You could have something on page 300 that’s really useful but it was posted six years ago so it can appear at the bottom of the list. Nobody really goes past the first page of a Google search any more so it doesn’t matter if there is twelve million responses as long as the most relevant ones are on the first page. If [the archive] was like that, I think it would be a really great tool. (SCB-13)

### ***Challenges – Hindered Learning (n=8)***

The “Challenges – hindered learning” subcode has few (8) coded pieces of text attached to it. I leave it as a unique subcode more to do with the fact that although the comments come from a variety of students, the issues are common. “Any frustrating activity for students based on course design adds cognitive load which may not be relevant to the learning outcomes” (SCB-13). “Learning the environment shouldn’t hinder learning the material” (SCB-11). Students speak about the process of their struggle to get to know how to work within the socially networked environment. They also struggle as to how to use and make sense of the archive. These issues are seen as barriers to learning. These same students change their view with use and time, but they remain challenged by the fact that they have to spend a portion of their time getting to know how to effectively use their learning environment. This issue is something that needs to be further examined as part of any future design consideration regarding an online archive.

### *Challenges – Summary*

The various challenges expressed by students throughout the above subcodes help mostly to paint a picture in support of an archive. What surfaces is a set of interconnected and networked ideas that help to continue to build upon the knowledge creation conversation, while at the same time help to frame a future model for the use of learning artefacts in networked online environments. We see in particular, a change in the way students see themselves and their relationship with their environment (personal efficacy) as they use the archive and work within their socially networked learning spaces. Supporting comments in this vein add to a positive experience and appear to act as a means for continued engagement and understanding.

Issues that appear to impede both the use and support for the environment and the archive focus on either the physical structure of the environment or how students choose to interact with both the environment and their peers. Issues such as time, navigation, hindered learning, custom Elgg, the LMS versus the social network, as well as solutions, all add to a basket of ideas for possible changes in the structure of the environment or the structure of the curriculum in support of the learning.

Discussions about plagiarism appear to open a door to a more philosophical view of learning, both how we learn and what must be in place to support the learning. The conversations about content author add to an even deeper view of the value of peers past and present, as well as those we appear to hold in higher regard, such as well-published authors and our professors.



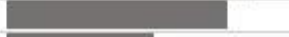




This challenges section does not suggest that an archive be dismissed. It does offer a variety of suggestions and opportunities to enhance and support the use of an

archive in a socially networked learning environment. This challenges section shows very positive student engagement and a willingness to work through a challenging environment as part of the learning process. More than anything I feel that these challenges comments show a high level of support and a desire to join in with the conversation and see how such a change to a learning environment can provide current and future benefit.

### **Custom Elgg – The Socially Networked Learning Environment**

The environment within which the course is situated is a custom instance of the Elgg open source social networking engine. Throughout my data I refer to this as “Custom Elgg”, although the university has given their product a name uniquely identifiable within their community. I choose to capture and discuss these elements as part of my overall project as I believe that student conversations specifically focused on this learning environment are an integral part of this study.

Figure 7: Custom Elgg Subcodes

<b>Code</b>	<b>Total</b>	<b><u>Bar Graph</u></b>
Custom Elgg: Blogging	28	
Custom Elgg: navigation issues	25	
Custom Elgg: Other environment comparison	23	
Custom Elgg: bookmarks	15	
Custom Elgg: valuable social environment	15	
Custom Elgg: strategies for use	13	
Custom Elgg: initial thoughts	9	

I break my Elgg subcodes down into the following seven categories (shown in Figure 7) not necessarily because they are unique, but more because they express the nature of the conversations and their relation to the broader conversation of the archive and the socially networked learning environment. For example, the main category

previously discussed, “Challenges”, also has a navigation subcode, however, as will be discussed in that section, the navigation issues are more broad-based within the environment rather than in relation to accessing the archive.

### ***Custom Elgg – Blogging (n=28)***

The “Custom Elgg – blogging” subcode is created to capture student comments about the blogging experience as a means of talking out learning issues or challenges. A number of students speak about their challenge to blog initially. In time, however, most overcome their concerns and begin to blog and use this tool as a supportive means in their learning.

“Personal blogs within the system allow for individuals to discuss topics of personal interest - not just classroom fare - and also serve as a record of the blog owner's journey” (SCB-04). “I think getting a sense that people are actually reading your blog is a great motivator (such as when comments are left)” (SCB-06). Seeing the value of a blog is a challenge for some, although students find interesting ways to express their understanding of this value:

I now see that blogging can be valuable both to me and to the instructor. It is a way for the instructor to gage [*sic*] my understanding. It was beneficial to me to reflect on what I learned as well as recognizing that I had some skills that could be transferred. It is a new way to learn. It is processing the information in a different way and I did learn from blogging. (SCB-20)

Students also speak about the blogging experience as opposed to the use of a discussion board within an LMS. Issues of personal efficacy can be seen in the

comments, as there is a concern about being noticed when blogging. “I think blogging is more personal...it is a platform for the user to reflect on his or her learning experience or on other topics. Discussions are more guided and are centered around group participation” (SCB-06). “Blogging gives a more personal perspective at times, but I found it somewhat disorganized. Threaded discussions seem to me to be organized, time-lined, hierarchical” (SCB-10). “I feel like my blog needs to be more polished than the group discussions. I don't always have time to do the polishing. I also don't think that everyone in the class will notice if I make a blog posting” (SCB-07). “When a course contains a prompt for an online discussion, the discussion has a natural flow to it. When a course contains a question prompt for a blog post, there isn't that same opportunity to develop and evolve ideas” (SCB-04).

Student understanding and personal evolution about their use of blogs can be seen in this exchange between two peers. “I felt that blogging was something that you did for fun and it didn't really have a place in an academic environment. I am not convinced that for me blogging was a really good exercise” (SCB-11). “My perspective is that blogs provide a great collaborative tool to share and exchange ideas. This can be a great resource tool, however [*sic*] if you are looking for a more immediate type of response and communication...email is king” (SCB-03).

At first I was very hesitant to even post on the unit questions. It can be very intimidating reading the posts of some of the other students who have very impressive backgrounds and knowledge. However, as I read more and as honest posters shared their difficulties, I felt that I could contribute as others had. (SCB-22)

*Custom Elgg – Navigation Issues (n=25)*

The issue of navigation has been discussed in the previous “Challenges” section. Although I wonder about possible repetition I realize as I read comments that there are multiple issues regarding navigation in this study, and I realize that students perceive these quite differently. For example “I find the Custom ELGG very complicated to move around and not very user friendly. But the archived material is great” (SCB-11). It is for this reason that I do not fold my subcode “Custom Elgg – navigation issues” into another similar code. Environmental navigation issues appear to surface at the start of each iteration of the study course, and these issues take up a fair bit of the early conversation. By recognizing these startup issues we might be able to reduce the time spent on these less-than-productive conversations in the future.

“[It’s the language], I still don’t know the difference, honestly, between a blog and a discussion” (SCB-12). “I, too, feel like ranting or crying (depending on my mood). I am totally unfamiliar with this learning platform and am finding the navigation a little trying. I don’t even have a Facebook page!” (SCB-01). “Tag Clouds? What are those?” (SCB-02). “I am frustrated with the Custom ELGG’s lack of ability to thread comments and my inability or shyness to want to start a new thread when I truly have nothing new to add” (SCB-15).

The discussions inside Elgg were a bit more difficult to follow, as they were not threaded. And I ended up reading the Elgg replies via my emails, which meant that I only went online if I really felt the urge to post a reply. (SCB-05)

*Custom Elgg – Other Environment Comparison (n=23)*

Student engagement with and understanding of the learning evolves as they became more familiar with the various tools and supports. The subcode, “Custom Elgg – other environment comparison” is created as I read comparative comments about the environment, both at the start of the course and in the reflections at the end. There are a number of somewhat disparaging comments about the learning environment at the start of the courses but these comments disappear throughout the body of the course only to reappear at the end, but with quite a different tone.

At the start there are a number of comments bemoaning the loss of a more structured LMS-like environment. “I think I would prefer Moodle for future courses as I am more familiar and comfortable with it. I missed the smaller groups and I think there was a higher level of interaction” (SCB-06). “I definitely preferred the Moodle threaded discussions to the Custom ELGG’s group discussion pages.” (SCB-18). “I briefly explored the Custom ELGG for class participation purposes but stuck to Moodle content and discussion forums” (SCB-20).

In the end-of-course reflections the comments generally show an appreciation of the socially networked environment. “I remember [when] Moodle was introduced I thought this was great. Now, I look and I think, ‘Wow, it’s so constrained, it’s so structured, it’s really stifling.’ I wouldn’t have thought that just a short time ago” (SCB-19). “The Custom ELGG offered much more, such as the ability to write your own blogs, follow other people and allow others to follow you, respond to messages in forums and more” (SCB-21).



***Custom Elgg – Bookmarks (n=15)***

“Custom Elgg – bookmarks” come about as a subcode as I read repeated comments about their value. I can see that the idea of bookmarks can be included in the archive, although in most of the discussions bookmarks and the archive are seen as independent pieces of the course. “In the later stages of the course, I was brave enough to begin exploring the bookmarks and found this to be very valuable” (SCB-03). “I really used the bookmarked sites that others left. I found that immensely helpful” (SCB-11). Course resources such as artefacts in an archive can add benefit to student learning and bookmarks, as a different resource seem to grab the attention of the students in a similar way:

I feel that if someone has made a contribution in the form of a bookmark, it has been like a little gift of knowledge. I have left a bookmark and hope to find more for the collective pool of resources. (SCB-02)

***Custom Elgg – Valuable Social Environment (n=15)***

The social nature of the learning environment and different ways that students use the openness of the Custom Elgg are mentioned as key factors in the success of the course. The “Custom Elgg – valuable social environment” subcode is one that I feel is relevant to the larger picture of the conversation in the classes. Students speak quite publicly about the value of the social aspects of their learning environment. “I like that it is rich and complicated and chock full of stuff” (SCB-18). “The Custom ELGG really is a little community, not unlike a physical university campus” (SCB-20). “Using the Custom ELGG has made me appreciate the value of using social networking to enhance interaction in a course” (SCB-21).

An appreciation for this socially networked learning space mostly appears at the end of the course sections as is quoted in the following examples. “It was a wonderful study of social platform tools in action in a learning environment. While I've used a lot of social platform tools, I've never had the opportunity to see this much 'structure' put around their use” (SCB-04).

This type of discussion with peers is one of the many reasons why The Custom ELGG is a fantastic place to have a classroom. Personal blogs within the system allow for individuals to discuss topics of personal interest - not just classroom fare - and also serve as a record of the blog owner's journey. (SCB-04)

I also like the idea that I feel more a part of things actually going on in University, than I did when only using Moodle. The different groups that people create allow a learner more opportunities to have input and to connect with people who have similar interests. Using The Custom Elgg was a highlight of this course for me. (SCB-33)

### ***Custom Elgg – Strategies for Use (n=13)***

The “Custom Elgg – strategies for use” subcode might be more closely related to one of the previous coding areas such as “Challenges – solutions”. I separate these two as separate areas to amplify ways that students work to provide assistance to each other, both in their current learning world and as an artefact for future learners. These tips or strategies are included for archival purposes, but I also see them as a unique form of assistance by students for future students. For example: “I've found this tip from the Help pages handy. It allows you to add a tab on the Activity page so that you can filter the posts you see just to those from the CRS group” (SCB-07).

One strategy I use to minimize my feelings of isolation is to log in periodically and check out the Activity page of the people I'm following. I'm often drawn in to an interesting blog post or page by simply looking at what other people have been doing. The Activity page makes me very aware of the networks I'm a part of and what they are engaging in. (SCB-04)

***Custom Elgg – Initial Thoughts (n=9)***

In many ways the “Custom Elgg – initial thoughts” subcode has been covered and discussed in other areas, yet there is one post that catches my eye and encourages me to keep this as a unique subcode on its own. At the beginning of the first course iteration one student posts a very public blog outlining their feelings about the course being structured within the socially networked learning space and being what she describes as a “car crash”. Her blog post receives a fair bit of attention and subsequently it appears to prompt her to reexamine her language and try to explain why she writes what she did. In doing so a number of her peers join into the discussion and help to bring the conversation to a place where others begin to see the environment with a more refined and critical eye. I believe that this posting has a positive impact on the course.

No - not a complete car crash. Thanks so much for your comments on this post - that's the treatment I deserve for posting a late night rant! :) But in all seriousness, this type of discussion with peers is one of the many reasons why The Custom ELGG is a fantastic place to have a classroom. Personal blogs within the system allow for individuals to discuss topics of personal interest - not just classroom fare - and also serve as a record of the blog owner's journey. (SCB-04)

### *Custom Elgg – Summary*

The use of an open source socially networked environment such as Elgg offers many opportunities for experimentation in ways of learning in a more social setting. As well, it appears to offer incremental ways for learners to become more comfortable with their learning environment. With this, students seem to show growth in their learning process, in their willingness to stretch out and try new things and to find new ways to understand their specific course content and the learning environment itself. Personal efficacy changes and grows as students slowly venture out from within the confines of the course group. It appears to not just be the structure of the course that causes this change but the overall experiment with the socially networked environment and the willingness to try different things within a reasonably safe and supportive shared space. The use of a socially networked learning space as is used in this study needs to be examined in greater depth and from different viewpoints. As indicated at the beginning of this document, the use of this socially networked learning space for my study was serendipitous. At this stage in my study I really do not know how I could have conducted my study and produced these results without the use of an environment similar to this custom Elgg instance.

This custom Elgg instance, used by the university in this study, has (and in some ways continues to have) many challenges and user interface issues that are even now (three years later) being resolved. The product is (or certainly was) closer to being on the bleeding edge of development of these networks than on the leading edge. Despite its potential as a key affordance for learning, this specific instance of the Elgg software is

itself part of a larger design-based research project and struggles to gain acceptance, appropriate funding, and the attention that both its users and its developers wish for.

### **Tacit - Evidence (n=36)**

One of the fundamental ideas in this study is to attempt to capture evidence of tacit knowledge or tacit understanding in the archive and through the actions of the students accessing and using the archive. The purpose for capturing this evidence lies in the belief that these evidential remnants might offer missing puzzle pieces for learners as they struggle to understand and develop new knowledge. This is expressed in my earlier reference to Gleick (2011) and the concept that ideas might have value but only to future persons who can intuit the value based upon their current reality. I never indicate that tacit knowledge is visible. My hypothesis is based on an understanding that evidence of tacit knowledge might be found throughout the various conversations left behind by students, as with my footprint analogy from Chapter 1. At times we can leave evidence of our tacit processes through our language. This can be seen in the form of truncated thoughts or through the structure of the thoughts we articulate. I code 36 examples that I feel might contain some evidence of this process. If we can see evidence of tacit processes through these examples, then possibly we can begin to see a greater value in an online archive knowing that others can gain access to aspects of our tacit knowledge and possibly make such tacit processes available to a much larger audience over time. In the end, whether evidence of tacit understandings can be seen and/or made use of should not alter the value or use of the archive.

The issues and challenges faced in this study with respect to participants tending to use the archive more as a vehicle for examining model assignments or other tangible

examples of work should only serve to bring to light challenges educators face with respect to changes in the value of the learning process. We have a history of enculturation around how we expect students to learn. Maybe one aspect of this study should be to find a way to offer another paradigm for learning and how technologies can offer a more visible means to support learning and knowledge creation. Tacit understandings are key to shared knowledge construction and the building of knowledge in this shared way. Whether we can see this evidence or not should in no way prevent us from seeing value in the use of an archive.

Some of the examples I code with the “tacit” code show evidence of students attempting to internalize, or make tacit what they read or view. “I use blogging to ask questions” (SCB-04). This may not necessarily show the tacit process but it does show the value of the items in the archive in relation to the process of making something tacit. “I was only looking for the main ideas and prefer visual as opposed to text information. The images help my recall to fill in the subordinate data for each main idea” (SCB-09). “I was able to look at some samples provided by previous students in the archive and better shape my direction” (SCB-09).

This next example shows a student acknowledging their learning process and how the “out loud” process inherent in discussions, which end up in the archive, can impact this process of tacit understanding.

I think that by talking out our struggles, we put possible solutions in front of us as we talk and these can act as scaffolds to support current and future understandings. This is neat. Watching tacit process become visible is very important - thanks for allowing us in. (SCB-04)

The process of blogging or discussing in a more public way appears to allow students to see the impact of the process of their thinking and knowledge creation. “I don't naturally gravitate towards this concept of blogging about what I am experiencing as I learn, but writing this particular posting has helped me to organize my thoughts for the next assignment” (SCB-07). “I did post some responses to others’ blogs and was always thrilled to read something from a co-student that resonated with my own thinking or that challenged my ideas” (SCB-17).

The following example comes from an extended conversation where several students speak about different ways of using technologies in training. This comment is part of a lengthy response talking out about how this individual finally comes to understand as a result of the extended conversation. “Your experience [using] Second Life for ‘bg’ [*sic*] training certainly resonates with its potential to provide much useful simulated learning” (SCB-17).

Students speak about the impact of certain postings and how they are able to “know” as a result of what they read and how they internalize and finally understand. “The mundane, the ordinary has opened my mind up on many occasions, these enlightenments were successful moments” (SCB-05). “Sometimes you can see yourself in what others are doing and that may help to kick your paper up just a little” (SCB-11).

Comments by students or faculty to other students'/faculty's posts could also add value as students might be able to follow the threads and help them to flush out more from the original post. The idea that postings (ie initial comments) and then subsequent postings about the original or subsequent postings offer a different and potentially new thread of understanding [*sic*]. (Anonymous)

Students appear to understand the value of the conversation both with their peers and with those who participate in the past but leave artefacts behind. There is a clearly articulated understanding that ideas and the process of knowledge creation is an iterative process that comes from the shared construction with one's peers:

The point is: look at what somebody else has done, take the good things, apply it to what you've done, and then create your own. People have to realize that learning is collaboration. It is about 'I've got this little piece, you've got this little piece, what does it make when we put the two together?' No one person has all the answers. That's why the archive is so important.

Wait a second... step back and it's as I'm reading the blog going, "Oh! Wait a second!" Exactly what you just said. This piece, this piece, somebody else said this piece, there it is. But it needs to be encapsulated as a whole because I think that is the whole process. (SCB-11)

It may be argued that I have not provided clear evidence of tacit knowledge or the tacit process but I have shown that the participants in this study clearly understand what happens in this tacit process and what they need to do to both assist themselves and others as they build upon and acquire knowledge. Students do understand the nature of "Aha" moments, and they know how to work with their student peers past, present, and future in support of this process.

You know if you're watching -- you're having a discussion in class live, or hearing a discussion online, and you get those thought-provoking comments where you go "Oh! Yeah! I know exactly what you mean!" or it provokes you to have a response to it. And it's good stuff. I think you have that advantage with



the archive, of having that with a much larger population, even though they're not there technically, right now. So little thought-provoking things where you go, "Oh! I never thought of it that way!" and actually, for me, it's on going back to the material going -- especially for the people who were kind enough to say, "Go to page 92", I can go back and say, "Oh, I hadn't thought of it that way." So for me, those little pokes, I'm still constructing the stuff, for lack of a better description, still synthesizing it myself. But, rather than having fifteen or twenty people giving me their view on things or their perspective on things, I've got two hundred. So for me -- I can see it being all-consuming, but that's not one of my concerns. I was thinking, if only I was doing all my courses like this now, I'd have to give up my day job because I can see going in there and never surfacing for six hours. There's good stuff. (SCB-19)

### **Chapter Summary**

I indicate at the beginning of this chapter that a significant period of time elapses from when this data is gathered and coded to when I analyse, re-code the data, and eventually when this chapter was written. I have no real way of indicating the ultimate impact of this time delay upon my eventual understanding of this data. I do, however, reflect upon my notes and the various discussions, blog posts, and other conversations I have during this process and can see an evolution in my understanding and my thinking process about this data. As I reflect upon my process as a participant in the research process and as the person who spends time analysing and coding the data, I am also able to see the evolution of the student participants in this study, particularly through the

various ways that they are able to articulate their thoughts and ideas captured throughout this chapter.

My coding and subcoding names express the most accurate representation for what I attempt to describe. My presence in and throughout the study offers me this uniquely personal perspective and thus these names are as much what I heard as what I experienced. The reader can see that the various quoted pieces of text lumped under any single subcode hold together as a theme.

The various themes and sub-themes each have multiple supporting data from students across two iterations. I believe that someone else could extract similar results from the data. Where possible I attempt to question student understandings to better understand their meaning. Where such questioning does not exist, there are repeated similar examples from a variety of students, which should serve to support my findings. However, as in all qualitative coding, the insights, understandings and even misconceptions of the researcher inherently interweave and enrich the data analysis.

What is particularly exciting today is that working through this results chapter and seeing the data in relation to my questions, my codes and subcodes, as well as its relation to my original theories in support of organizational knowledge creation, I can for the first time see a clear and coherent message. Through this study I see significant support for the use of an online archive and the value it can add to the learning process.

The key areas of the “Use” code show that students value the sharing of ideas and documents with each other as well as to and from the archive. The sharing subcode is attached to a significant number of pieces of text, which speak at length about how and why students share documents, and their use of retrieved documents from within the

archive. Additionally, students clearly demonstrate their understanding of the archive and why they use it. There is a clear understanding as to why students could or would use the archive and how it benefits their learning. The “Use” code also brings forward issues around the limitations of the archive and frustration around its use, although these comments are overall few in number. Students use the archive by retrieving items from it and adding their own artefacts for future students. The study clearly shows a very positive reception for its use.

The “Value” code comes from a great variety of directions. Student perception of value peaks with a clear understanding of how the process of engaging an archive can enhance learning. The act of working with and through the artefacts is spoken of very positively at length. Students show clear support for the archive being a living vehicle that they have been shaped by, and one that they can shape by their engagement with it. The archive is also seen as a rich resource, one that serves to support their learning and their engagement with the course as well as their peers. Students speak in “Value” terms more than any of the other code areas. The many examples serve to push forward the idea of the archive as a viable vehicle for future online courses.

Although the “Challenges” code primarily speaks about the mechanics of the archive in terms of navigation, the environment, solutions and time, one of the more significant unintended consequences of this study surfaces within this coded area. This is the issue of personal efficacy. The degree of challenge experienced by the students and their reaction to these challenges seems directly related to the sense of net and personal efficacy felt by the user. This is not to suggest that interface, tool set, and search capability in this environment are not in need of significant improvement, but in addition

that finding value is possible, this is dependent upon a sense that the user has the skills and the time to find that value. It shows just how valuable an archive can be for students in online environments; in particular as is offered in this course. The use of a socially networked online learning environment as the socially networked classroom space appears to allow students to become more comfortable and engaged with their learning. A combination of the archive and the socially networked learning space allows students to gain a great degree of efficacy. If this can be mirrored in further studies then it can become a significant reason for rethinking the design of learning environments in the future.

The “Custom Elgg” learning environment cannot be ignored in this study. The impact of this socially networked learning environment on the learning process and the ability to support an archive as created and used within this study environment needs to be examined further. Initial challenges encountered by students can be expected when any group of learners are moved into a new and unfamiliar environment. As is outlined by the data, students are innovative with regards to their approach to this environment. Most are supportive and sufficiently engaged as they articulate their concerns while at the same time they continue to move forward and make the environment work for them. This environment is continually evolving, and those who manage the environment learn from the experiences of the users and regularly attempt to shape and improve the environment to suit the needs of the many.

The “tacit” code helps me to circle back to my hypothesis and to see just how the data supports the core ideas of organizational knowledge creation theory. Evidence of tacit knowledge or tacit knowing surfaces as students clearly speak about their

understanding of the process of knowledge creation. Although alluded to by some, the process of articulating one's thinking process and leaving it visible for others is more clearly understood or expressed only by a few. An archive can be a place where evidence of tacit understandings might be found, and when found can be used to great advantage as outlined by the examples in the data. It can be argued that finding these tacit gems might be serendipitous, yet any or all of the content of an online archive can be seen in the same light. I am not sure that this study provides any definitive response to the issue of tacit artefacts in the archive but the data does show evidence of these tacit artefacts, and even clearer evidence that students are capable of understanding the use and relevance of these same tacit elements.

The one area where there is no direct referencing on the part of the students is that of *ba*. In many ways this is not surprising because *ba* should not really be part of an overt conversation: *ba* should either be there or not. One should be able to see evidence of *ba* and I think this can be seen in the excitement and tone of many of the conversations. At times *ba* appears within some of the conversations where the speakers were tripping over each other as they work to keep certain conversations alive and to connect to the overall theme of what is being said. *Ba* changes the environment in such a way that students become engaged and support each other in their learning: this is clearly evident in the data.

At the start of this chapter I outline five enabling factors or conditions (von Krogh, Ichijo, & Nonaka, 2000) in support of the process of knowledge creation and suggest that these conditions are present in my study. I argue that elements of OCKT can be applicable in an education domain and that these elements offer supporting models as

evidenced by the data. Examples of these five enabling conditions can be seen in the following way:

*Instilling a knowledge vision* is clearly visible in the way that course participants engage the archive in support of both personal and shared learning. Learners show understanding with respect to the value of the archive in the knowledge creation process. The *managing conversations* and *mobilizing knowledge activists* factors come together with those individuals who see value in and became boosters of the archive. The data is rich with conversation both from those working together at the same time in the same course iteration, as well as from those using the archive as a means of leaving *relics* behind in support of the learning and knowledge creation of future members of the course. The *creating the right context* factor is demonstrated through the use of the Custom Elgg environment and the way that this unique learning space is used as a contextual frame in support of learning. Lastly the *globalizing local knowledge* factor can be seen both by the socially networked learning environment and the way that it supports dynamic growth of the archive and by those who understand and are excited by their personal knowledge development and thus bring their excitement and passion beyond the course. Examples of these enabling factors help to show the links that do exist between the foundation theory of this study and the actual research. The next and final chapter provides a summary and recommendations for future research and investigation.

## Chapter Seven: SUMMARY AND RECOMMENDATIONS

### Chapter Overview

Early in this document I speak about this research study being a meta-study of my own learning processes, thus this work has a certain *Autoethnographical* component to it. The writing of this dissertation, for example, mirrors a process of accessing an archive of peer work and attempting to see how these peer artefacts could assist me in the production of this final document. I am a social constructivist and see the world as a subjective place where learning and our reality is shaped through and by the worlds we inhabit and by our interpretations of this world. Polanyi's (1974), idea of "subsidiary awareness" very much describes my understanding of my subjective world in that as we learn and create knowledge, we brush up against and are informed by a dynamic internal peer world that is an embedded part of ourselves, and is constantly changing as a result of our learning and knowledge development. In most formal learning situations we find ourselves interacting with other learners as they seek to learn and to acquire knowledge. Learning environments are generally constructed to allow for forms of peer interaction. In the time allocated for most courses these transient student interactions serve the multiple purpose of learning from the course content, from the teacher, and from the interaction of one's peers. The course is then reset and the process begins again as though none of these prior interactions existed. This *reset* process or *zero-point*, as I describe earlier, challenges my understanding of the learning process as well as my business management background, and thus by examining theories and processes from a discipline other than education, I might be able to put forward a model for a learning environment that offers a richness and a level of engagement within learning

environments that at present appears not to exist. This existing *reset* process denies an opportunity to learn from those learners who have gone before along with any related learning artefacts left behind in this process. This project examines the value perceived by learners through their interactions with learning artefacts used within a social-networked learning environment.

“Organizational knowledge creation is the process of making available and amplifying knowledge created by individuals, as well as crystallizing and connecting it with an organization’s knowledge system” (von Krogh, et al., 2012, p. 241). My research project is an attempt to mirror aspects of this business and organizational management process in an education context in the belief that this successful business model can offer innovative insights for the design of online learning environments. OKCT brings a number of key elements to the discussion, including the process of knowledge creation using the SECI model and *ba*, as the context within which knowledge is shared and built. These key elements, which have been used and threaded throughout my study, are also included in the data and become key aspects of the design principles introduced in this final chapter.

Dewey (2009) states:

Consider the history of any significant invention or discovery, and you will find a period when there was enough knowledge to make a new mode of action or observation possible but no definite information or instruction as to how to make it actual. (p. 3)

We are living this history today. We have the technologies and the resources to create unique and innovative learning environments that foster the processes of learning



and knowledge creation. We must be willing to cross academic domains and creatively imagine connections within and among these domains. This is one of the exciting aspects of a design-based research approach. Both the active involvement of the researcher in the project and the iterative, double-loop like approach (Argyris, C., 1977; Argyris, C., & Schön, D. A., 1978) to the research, allows review, modification, and the evolution of new questions throughout the study based upon findings as they materialize. The use of the archive and subsequent contributions to this archive can become an ever-expanding circle of knowledge creation and learning with the ability to modify one's approach and one's thinking based upon continually re-examining the archive and making further contributions. Design-based research is an iterative, circular process with the ability to modify the research direction and develop new questions based upon findings within subsequent iterations. The use of the online archive and subsequent re-contributing can serve the same purpose. Learners can modify their learning direction based upon new understandings and the evolution of their thinking as they engage and contribute.

OKCT pushes the bounds of management thinking with respect to the use of tacit knowledge to develop corporate assets and create a competitive advantage. This research study looks at the use of archived discussions in online learning environments and finds *evidence* of tacit understandings, which is used as a form of scaffolding for learners to expand their understandings and to provide them with tools to create a competitive learning advantage. This evidence is best illustrated in the way that artefacts illustrate tacit knowledge. As indicated throughout this document, I do not find tacit knowledge because tacit knowledge is not visible. The evidence shows however, the visibility of the tacit process: what I refer to as "tacit knowing".

Hakkarainen (2009) presents a series of arguments regarding artefacts and their impact on the knowledge creation process. He adds:

Ideas understood as conceptual artefacts do, indeed, function as carriers of what we will call knowledge advancement, a broad term meant to embrace conceptual and material aspects, and which subsumes “knowledge building.” (p. 218)

The way students work with ideas is different from ordinary oral discourse taking place in many classrooms because of the technology-enhanced learning environment transforming the intangible insights generated to digital form, and therefore, also, materially embodied ideas that exist outside of the participants’ minds. (p. 219)

Granted, the study Hakkarainen refers to above involves grade-school students, but the fact that researchers are beginning to examine learning artefacts as meaningful knowledge creation tools within computer-mediated learning environments speaks to the nature of my study. The rapid pace of change in technologies and their use and impact in education can only serve to enhance learning. Educators need to find creative and innovative ways to integrate and use these technologies in the online classroom in a way that the dynamic of learning, the process of knowledge creation can expand and grow at a pace commensurate with the surrounding changes and uses of technologies, such that we not only have enough knowledge to make a new mode of action, but we now have examples of how to make it actual (to paraphrase Dewey, 2009).

Integrating ideas and concepts across domains can and should benefit multiple academic worlds and should allow researchers to benefit from parallel concepts fused with similar potential. For example, OKCT offers an opportunity for education to

experiment with concepts and foundational constructs that can benefit online learners. This sheds light on the potential for the integration of otherwise discarded scaffolds, which form a key thread throughout this theory. Hopefully this research project can serve as its own artefact in the quest for knowledge creation. This knowledge creation can take on the form of design principles and these principles as the outcomes of this project will be discussed within this final chapter.

Overall, the data shows that the idea of having an archive available in a social-networked online course is perceived by the students who participated in this research, by the instructor, and by myself as enhancing learning and the learning environment. There are many challenges to the introduction of this idea, as the data shows. By distilling the data down to a few key points I am able to outline the following design principles in support of the use of a socially networked learning space as a viable online environment, as well as the embedding of an archive in such an online learning environment.

“Design research is not defined by its methods but by the goals of those who pursue it” (Bereiter, 2002, p. 321). This project has several goals, including the assessment of a social-networked environment as an effective learning space to house a dynamic archive. This study originally focused on the archive: its use and value, as outline by my hypothesis in Chapter 3. This is a key element of the findings of the study. The results of this study demonstrate that should such an archive be included in an online course, the online course would best be situated within a socially networked learning environment. Thus there are two key products that surface from this study: the archive and the socially networked learning space that can hold and support this archive. This study shows the feasibility of these goals.

## **Answering the Questions - Circling Back to Beginning**

In the final pages of this dissertation representing a multi-year endeavour I need to satisfy my audience and myself that I have been able to adequately address the core questions and issues asked and that were raised throughout this study. Do I answer my initial questions in this study and am I able to effectively show how aspects of organizational knowledge creation theory might be an effective means to support the use of an archive within a socially networked online learning environment?

I will begin by presenting the three core questions, as indicated from Chapter 3, and after each I will provide a summary response. I will attempt to steer away from taking personal “jabs” at my own naivety in the choice of these words for my questions. In retrospect, however, without this naivety and belief in my project I would not have been able to keep the fire alive and been able to continue to push myself to a stage where my naïve faith became solid belief and understanding.

- In an online distance education setting, how can the process of knowledge creation be orchestrated and supported by the use of digital archives including archived discussions, blog postings, shared bookmarks, wiki pages, asynchronous and logged synchronous discussions?

I believe that the answer to my “how can” question lies with several aspects of the outcome of this study. First, as will be indicated in my design principles, for an online archive to be an effective element in support of knowledge creation, the virtual classroom should ideally be placed within a socially networked learning space. This social learning space offers the learner the opportunity to engage a larger world. Depending upon the structural components of the learning environment, such as offered by an open source

tool like Elgg, the learner is also offered a safe and controlled private/public set of spaces within which to engage in knowledge creation and learning. The context known as *ba* can be created and maintained within such a structure. The nature of the permeability of the *walls* of the different social spaces allows for the cross mixing of *ba* beyond or among the confines of any one course or group. By so doing, the ability for knowledge creation is greatly enhanced and the opportunity for the SECI knowledge spiral to continue to expand with multiple *ba*'s within these safe social spaces can become an integral part of these environments.

The resulting digital archive can grow and evolve as it is used and added to and as it is continued to be viewed as a valuable part of the learning process. Student comments suggest this value particularly as they describe learning and knowledge creation benefits accrued from the use of the archive. Some students choose not to use the archive and others see its value in ways I had not imagined. What these differing perspectives offer are opportunities for designers to find alternative ways to support complementary approaches to the design of effective learning activities, many of which can include an archive component.

- What perceived value do these archives offer current learners; what impact do these online archives have upon learner's perceptions of their levels of persistence, motivation, and reflective practice; and what other effects surface as a result of having past and concurrent archived material embedded in the curriculum?

One of the key values not originally asked in this question is that of efficacy. As noted throughout this study, student efficacy becomes a key element in support of the archive and the social-networked environment. Persistence, motivation, and reflective

practice all become key value aspects of the use of the archive. Some students look to the archive as a guide, and at times a mirror in support of their understanding of an assignment. A number of the students comment that the archive acts as an additional supporting factor in their learning beyond the teacher, the content, and their peers. There is a caution with respect to an interpretation about what students look at and why. Students use the archive as a means of finding exemplars to support their learning. They look for examples and model assignments. Can this use be seen as a means of supporting knowledge creation or does this just become a quick and easy means of building one's assignment with limited learning and knowledge creation? It could easily be the latter. The design of assignments and the nature of the social engagement within the online environment play a key role in the value students potentially gain from their use of the artefacts in the archive.

Learners use the archive for a variety of purposes, many which are not imagined at the outset of this study. For example as students begin to see how they might benefit from certain artefact types, they begin to also see how they can offer their own artefacts that might support future students in the course. This is not just a personal efficacy issue, as it also helps to offer the contributing students an opportunity to ensure that their archive contributions are up to a standard believed appropriate and acceptable to these future students. In this process, the students appear to spend additional time making sure that they sufficiently understand what they are leaving behind, and hopefully provide meaningful commentary in support of these various additional artefacts.

By using the archive students also begin to see the nature of their learning environment differently. As discussed in the results section, the concern about plagiarism

is part of an early set of conversations. In time, students begin to realize how they might best use the various artefacts and how these artefacts support their learning process. This change in perception appears to allow the students to engage the archive differently and to support their learning process in multiple ways.

- Are there perceived barriers to the use of these archives? If such barriers exist, are these barriers seen to be as a result of the use and/or accessibility of the archives, the nature or dynamic of the current course, issues of privacy and control, or other inhibiting factors?

Barriers and the perception of barriers surface in a number of ways. By recognizing and understanding these perceived barriers, users and course designers can build and use environments with an archive in very positive ways. As discussed through the results section, the learning environment (custom Elgg) is seen both as a barrier to learning and a rich tool in support of learning. The idea of introducing an archive to online learning environments is not about eliminating any other supports or means of facilitating learning in these environments; rather, it is intended as an additional or missing piece in the evolution of online learning environments.

The barrier aspect of the learning environment comes about primarily as a result of its newness and the overall lack of familiarity with a socially networked learning environment. This environment barrier wanes with use; however, until these types of learning environments become more common place there will need to be processes put into courses in these types of environments to support students with their early teething issues to reduce the amount of wasted and misdirected time.

Barriers to the use of the archive come from a variety of places. One of the key barriers is the limited search capability. This feature improved in a subsequent version of the software; however, the very nature of the heterogeneous content of the archive within this socially networked learning environment makes searching a challenge at the best of times. Much of this is dependent upon the author of the artefact and the way the artefact may have been labelled, tagged, or further described when it was originally created. New features such as *liking* or *favouriting* have been added and should change the dynamic of some of the content in the archive. As with any user-controlled system many of these challenges will always be present.

The *controllable privacy* aspect of the custom Elgg environment is one of the aspects that may impact any archive placed in this type of learning environment. All users can add, modify, or delete anything and everything that they create. This control is a very powerful feature of this type of environment and can offer a sense of safety and security. It can also become a challenge for an archive. The richness of the archive and the benefit that it can offer students is immeasurable, yet if students can add, modify, or delete then the archive can become altered as a result of any of these subsequent changes. This is an issue that will need further study, but one that both users and future course designers need to be aware of.

OKCT posits that tacit knowledge held within individuals in an organization can be effectively leveraged under the right conditions in order to create competitive advantage. I argue that a similar competitive advantage can be made available to learners through a comparable process of tacit knowledge sharing and subsequent new knowledge creation. I outline that tacit knowledge is an internal and unarticulated form of



knowledge, one that can be used to assist in the creation of new knowledge. A requisite condition for such knowledge creation is a Japanese contextual construct known as *ba*. *Ba* becomes the enabling condition in support of this process. Has this research study shown a connection between aspects of this theory and the introduction and use of an online archive?

*Ba* can be constructed and maintained within almost any environment. This study shows evidence of the construction of *ba* and the engagement of individuals within *ba*-like structures. This study also shows evidence of knowledge creation as a result of student engagement within these *ba*. The impact of the archive as part of the knowledge creation process is also shown in this study particular where students comment on how certain artefacts impact and change their understanding of the course material. One student in particular speaks of how the archive acts as an additional person in the various conversations and serves, at times, to add to the overall learning.

Key aspects of organizational knowledge creation theory can be used to support, not just the integration and use of an online archive, but they can also serve as a support model in the creation of learning environments within socially networked spaces. The structural components of the SECI process and the addition of *ba* can serve as guiding principles in the design of such learning environments.

The foregoing section outlines how I have been able to address the core questions and issues asked and raised throughout this study. Not everything or every issue follows in a clear and straightforward manner. However, as is outlined through this study, I am able to show how aspects of OKCT can be an effective means to support the use of an

archive within a socially networked online learning environment and how artefacts within an online learning archive can offer value in this learning process.

### **Verification of the Reliability and Validity of Data**

There has been considerable discussion in the literature on the relevance and meaning of the terms reliability and validity that were derived and developed within the positivist research paradigm. Some have suggested the terms need to be fundamentally redefined to have meaningful roles in interpretative studies (Guba & Lincoln, 2005). Guba and Lincoln (1982) introduce four criteria for judging the soundness of qualitative research. These are: credibility; transferability; dependability; and, confirmability. I use two of these standards to judge my work and, as I indicated in the methodology chapter, I use a set of five strategies that Morse et al., (2002) outline to ensure both the reliability and the validity of interpretive data. The first is that of methodological coherence. The aim is to “ensure [there is] congruence between the research question[s] and the components of the method” (p. 18). As noted in the sub-section immediately before this one, I show that my questions are answered and provide a discussion outlining how they are answered. In the description of this first strategy the authors also indicate: “as the research unfolds, the process may not be linear. Data may demand to be treated differently so that the question[s] may have to be changed or methods modified” (p. 18). My design-based study is far from linear and its’ design encourages and supports needed changes to match the evolution of the study. Additionally a sub-set of questions is developed, as noted in Chapter 3 and this is in keeping with the iterative nature of the study.

The second strategy suggests: “the *sample must be appropriate*, consisting of participants who best represent or have knowledge of the research topic [italics in original]” (p. 18). The sample consists of two course iterations of students in a Masters’ program focusing on distance education where the program is conducted online. The course is taught within a socially networked online learning environment. Although everyone was encouraged to participate in the research intervention, not all did and as outlined in the results chapter a small number participating in the study did not see the study in a positive light. My sample is the type of audience that might be most interested in the topic (as students enrolled in a Masters’ of Education Program) being researched and thus there is understanding and knowledge of the topic being researched.

The third strategy suggests, “*collecting and analyzing data concurrently* forms a mutual interaction between what is known and what one needs to know [italics in original]” (p. 18). I play an active role in the study as a course colleague and researcher and in this role I collect data as well as being free to comment and talk to the class and the professor. As noted earlier in this document I form a variety of impressions and am challenged by the data as much as the process of engagement by the students in the course. My meta-learning is supported throughout this process as I read and examine the data and then use what I learn to continue conversations with the course participants. Collection and analysis is a concurrent process.

The fourth and fifth strategies are, *thinking theoretically* and *theory development*. My theoretical thinking began as I fleshed out my ideas at the start of this project and has continued through to the writing of this document. I started this project with the belief that a business management theory (OKCT) could form the basis of a change to online

learning environments. As each element of this study has come together and the research is conducted and the data collected, I have applied this theory consistently to my thinking and made it a continued part of my discussions with the study participants. My understanding of this base theory has evolved as well as its applicability to the archive. My theoretical thinking has also evolved and the data has only served to further confirm my beliefs about the use of aspects of OKCT in online learning environments.

The last strategy, theory development, ties directly into the nature of design-based research in which there is an expectation of the development of design principles or a framework that can allow broader application and testing of the results. The section that follows this one outlines these design principles, which are “an outcome of the research process [and] a template for comparison and further development of the theory” (Morse et al., 2002, p. 18).

Guba and Lincoln (1982) outline four standards against which a qualitative researcher should measure results and I will briefly discuss these four standards and then outline two of these with respect to my study. The first of the four standards is credibility. This standard asks if the researcher’s “analysis, formulation, and interpretations” (p. 246) are credible or believable. This is seen as an issue of internal validity. The second standard is transferability or the issue of external validity. The third standard is dependability, which speaks to issues of the reliability of the data, and the fourth standard is confirmability or the objectivity of the data.

In my study the standard of transferability can be seen through the thick description of my data and the process of gathering and analyzing this data. Not only is the data reported as specifically laid out by the research participants in the study but the

context of the various patterns and relationships between and among the research participants are described. In my methodology chapter I describe at length my assumptions and the manner by which the data was gathered, analyzed and coded. The overall context of the study has been provided with extensive detail providing a behind-the-scenes view of this process.

Dependability, as a measure of reliability, can be seen, in part within my research by the use of interviews as well as the analysis of the data by the researcher. The interviewees were asked to discuss their role as research participants and how their understanding of the data might impact the future use of an archive-like structure. Additionally the iterative aspects of my design-based study allow for emergent design as the lessons learned from one group can be added to subsequent groups.

### **Design Principles**

As a result of my analysis of the data collected I have created a series of design principles or outcomes in support of such a changed learning environment. “Educational design research can contribute to the development of theories that are used to describe, explain or predict certain phenomena. In addition, educational design research can yield theoretical insights of a prescriptive nature” (Mckenney & Reeves, 2012, p. 21) that can be used to design related educational interventions.

#### ***A Dynamic Course Archive***

How do we create an online course that includes an archive and what do we need to do to ensure that the archive becomes a seamless part of the learning environment? There are key points that surfaced through this study that can be used to support such an archive and provide the grounding for this first design principle.

Until and unless learning management systems offer greater access and permeability beyond the initial instance of a course, the use of an online socially networked learning environment such as Elgg is a key environmental necessity to support a dynamic archive (discussed in the second principle). Institutional controls with regards to access restrictions need to be congruent with the pedagogical needs of the archive and its intent. There needs to be a dynamic permanence to support the evolving growth of the archive. The archive itself needs to be stored and accessed in such a way that both those contributing and those searching have appropriate guidelines and tools in support of a coherent model that allows for ease of use and accessibility. Course assignments need to be structured with an awareness of the archive such that the value of the archive can be appreciated through the work done in the course. In this way, learners accessing and leaving artefacts behind can build an understanding of their relationship with the archive and its value. Finally, in further support of OKCT, there needs to be ways to allow the context for knowledge creation to be supported within the archive. As outline earlier in the literature review chapter, *ba* is a key element in effective knowledge creation. The five factors ([linked here](#)) in support of the creation of *ba* can also be built to support the use and evolution of an archive. The following points provide a more in-depth description of this set of principles.

- The course must be situated within an environment that supports permeable boundaries, invites and allows for a cross section of attendees yet permits the user to have complete control over their contributions, and will allow for a dynamic permanence of participant contributions.

Examples of these socially networked environments exist beyond the

study university (Jeff Miller, personal interview, April 8, 2011), and given the rapid pace of change with the technologies, and our changes in understanding the use of these technologies, these worlds will become more common as we shift our understanding around what is best needed to support learning in a networked world.

- In the design and building of a course that includes an archive such as investigated in this study, the technology supports must be sufficiently sophisticated to allow users both a seamless way of adding to the archive as well as equally seamless ways of finding, accessing, and using needed or desired material from the archive. Student data in my study provides a variety of suggestions regarding ways that data in the archive can be recognized, tagged, or ranked. Variations of these technologies would provide a key doorway for access to the material in an archive. Not all online environments behave the same or use a common understanding with respect to language and use or access mechanisms. As students have become acculturated in LMS environments, a similar acculturation can and will occur with continued use and acceptance of these social-networked learning spaces.
- Instructional design elements always play a key role in effective formal learning. One of these elements as discussed in the results section is that of plagiarism. This plagiarism conversation in the study course proves to be of little consequence due to the nature of the assignments and the course process. Plagiarism is a significant issue and depending upon the

nature of course assignments and the intent of the learning outcomes, an archive could prove to be detrimental. In one of my study interviews I ask the interviewee if they feel an archive could be in any course. Their response suggests that it might not be suitable for undergraduate courses primarily due to maturity concerns. My study does not cover this aspect (maturity). An archive might very well be a viable option in courses across the spectrum of K- graduate level education depending upon the learning outcomes, the nature of assignments, and the overall purpose of including such a device in the learning environment. The very social nature of the elementary grades for example, suggests that having access to the work of peers offers support in learning in these early years. The conscious inclusion of an archive is very much a design consideration. As with the various examples of courses in the UBC, MET program, many have an archival compilation of years of content and contributions but some deliberately do not have an archive and are reset after each iteration of the course (Jeff Miller, personal interview, April 8, 2011).

- The instructional design needs to include the process of knowledge creation and the impact of creating and maintaining *ba* in these virtual environments. Although many of these elements are intrinsic aspects of the world of teaching and learning, starting the class with an overt conversation (it could be an introductory assignment) that specifically talks about the nature of knowledge creation, the impact of tacit knowledge in the learning process, and the context within which



knowledge is created (*ba*) can only help learners to better understand the process of the archive and the design of the course. This conversation can offer students a better understanding of their engagement with the archive, the course content, their peers, the teacher, and the landscape that they help to shape and offer up to learners in the future. Many of the comments made in this study deal with an evolution in thinking and understanding with respect to the archive and how students feel that they are not just learning in their course but they are contributing to a much larger world of understanding for themselves and for others beyond their course. Personal efficacy and self-reflection is greatly enhanced as a result of this engagement. There are aspects of altruism in many of the comments – perhaps both sparking and sustaining a new “altruism presence”. It might be suggested that this sentiment is manufactured as a result of my study, yet if we can engage our learners to the point where they understand the larger purpose in their learning then we will be providing a richer, deeper, and more significant learning experience. If the archive serves no other purpose than to offer learners a richer engagement with their course and the realization that what we do now in this class is part of a larger connection to a learning continuum, then its placement within learning environments becomes invaluable.

Is there value in the inclusion of a dynamic archive containing learning artefacts in online courses? This study examines the value perceived by learners through their interactions with learning artefacts used within a social-networked learning environment.

At this final stage in this summary I wish to outline what can be done to support the inclusion of such an archive into online courses based upon student perceptions indicated in the results chapter.

I speak at length in this document about the inclusion of key aspects of OKCT such as the knowledge creation cycle (SECI) and the creation and use of *ba* as a context within which knowledge is created and becomes visible (Konno, 2009). I also allude to aspects of Garrison, Anderson, and Archer's (2000), Community of Inquiry model and how the different "presences" can be used to support an archive from within a virtual learning environment. My study does not capture direct evidence of teaching presence as I did not capture any of the teacher data, and therefore cannot comment on the impact of the teacher in this case. Teaching presence is clearly noted through the lens of the students in this study. It might be argued that my presence in the course as the researcher provides some of this teaching presence, as I held synchronous sessions to assist students in their navigation and use of the environment. As well, I regularly provide updates and supports for access to the existing archive. Teaching presence is, however, a key element needed to manage the environment in support of the knowledge creation cycle and to ensure that *ba* is effectively constructed and maintained within the course.

The data shows evidence of cognitive and social presence. These attributes are supported by a number of the indicators listed by Garrison, et al., (2000, p. 89). Students repeatedly express interest in using the archive as a means of extending their understanding of new material, of becoming more comfortable with their environment and surroundings, and of being able to use the archive to provide knowledge connections in the process of developing new understandings. Social presence is indicated by the

positive and inclusive comments left, participation in a profile, and “following” by some students of the teacher and their classmates.

### *Social-networked Online Learning Environment*

Although a socially networked learning environment as a virtual classroom space is not the major focus of this study, its value and its implications on archive creation and retrieval quickly surface as a result of the placement of the intervention in this study. Ironically these learning environments, as a factor in my study, are not a part of my original model. This intervention, the inclusion of an archive in an online course could only work by being placed within a course inside the custom Elgg environment, where it was housed throughout this study. My attempt here to outline the use and future value of a socially networked learning space as a virtual classroom or campus is only discussed in relation to my narrow study of the inclusion of the archive in the classroom. My comments, suggestions, and recommendations are only based through the narrow lens of the two iterations of this study and are coloured by the focus of students attempting to transit through their course given the parameters of their specific assignments and their expected use of the archive. More studies need to be undertaken to better understand online socially networked learning environments. The thin slice that my study offers to this larger conversation will be discussed in this chapter and here I outline design principles applicable to such a social learning space.

The principles specific to this section speak to a larger issue of the use of less restrictive tools for student online engagement and learning. This study specifically focuses on an open source social networked tool (Elgg) and ways that this environment was used to support student learning and the integration of an archive. Until learners

become more familiar with this type of online learning environment they need to be offered synchronous orientations to guide them through this physical online environment and assist in an orientation of the language used to describe the various elements of the environment. Users need to be allowed to experiment with the various permissions and security features so that they can become sufficiently familiar with the impact of using the control features of the tool and the impact that these features can have on the environment as a whole. There needs to be a form of a visual site map to allow users to see where and how their work and their different online spaces interact with others. In having such a network map users may also begin to see how to take advantage of the shared spaces across courses and find ways to engage the crowd in support of their learning. An archive, as described in the previous principle can become accepted practice throughout the socially networked environment with common structures in place to allow for the sharing across disciplines and the building of multiple *ba*'s across the entire social learning space.

The data, as discussed in Chapter 6, shows a great variety of introduction and navigation concerns regarding the social environment that houses the course sections in this study (Custom Elgg). These particular challenges should not be seen as long-term impediments to the use of such an environment; rather these challenges need to be seen as part of the evolution and growth of social network spaces as learning environments. Like many of the technologies in use today in education, there is an incremental adoption in our understanding of social networking as use-tools or environments, the technology itself becomes more 'user-friendly, as well as an evolution and refinement of their use on a day-to-day basis. Although the purveyors of LMS environmental tool-sets attempt to

ensure that their products are sufficiently embedded into educational organizations and that their suite of products work across institutions and beyond, there appears to be sufficient external pressure to either allow for experimental dual adoption, as is the case in my study environment, or finding ways to adapt existing products to allow for aspects of social networking that can extend beyond a single class, within the institutional LMS products.

This study does not look at the impact of an LMS other than from students comparing their experience with an LMS to their new socially networked environment. For most of the study participants, once they become sufficiently acculturated with the social-networked learning environment, many push themselves and their learning peers to find ways to benefit from the social-networked environment, both at a micro and macro level. The idea of using a social networking tool similar to the one used in this study (Custom Elgg) to create learning spaces is powerful from the perspective of the control that is given to all participants in a course, and in the environment overall. Each member, learner, or teacher has complete control over his or her contributions, as outlined earlier, and this changes the dynamic of the learning space in that users appear to not hesitate to speak out about issues without concern about their audience.

At different times throughout this document I speak about the issue of privacy and access within different learning environments. This refers to the perception of privacy afforded by LMSs as well as a similar view of privacy that may or may not be afforded with the use of a socially networked online learning environment. Earlier I discuss the LMS and its walled environment and how these institutionally managed, impermeable walls create a privacy trade-off against the flow of learner engagement and potential

understandings beyond the narrow confines of the environment. The custom Elgg environment, as outlined in its *About* statement, speaks of a world of *controlled privacy* whereby its users determine what is created, edited or deleted. This level of control within an online social space is fairly unique but one that is needed to support learning in networked communities. Many of the public blogging tools such as WordPress and other wiki-like environments are more open and do not offer controls similar to those offered by software such as Elgg. Privacy and safety are important aspects of any social environment, yet in education where individuals are struggling to understand and to find their place within their own learning, having others watch or be a part of the process is not necessarily conducive to the learning process. Learners need safe and controlled environments within which to stretch and stumble and find their level of comfort with their learning. Access and privacy controls are a fundamental component to a learning environment.

The early generation socially networked learning spaces will evolve and become more user-friendly as more students and educators use and experiment with them, and developers and their toolsets improve. The data from this study shows that effective use and engagement comes from informed users. To use this environment as a virtual classroom, faculty need to ensure that suitable guides are in place to allow users to become comfortable with the structure of the environment, to fully appreciate the user controls, and to understand the user's relationship with their respective tool sets and their useable spaces. For example, students in this study speak about their challenges in understanding the relationship between their personal blog space and the blog space of the course, as well as making sure user controls are set based upon assumed defaults and

how to ensure appropriate privacy can be maintained for different types of conversations. Additionally, students express concern over the ease by which they can or cannot find the various documents or conversations they wish to have access to. These navigation concerns need to be addressed.

Many of the issues expressed by learners in the two iterations of this study will be very different a year or two from now, especially as more and more learners come to their online education with greater experience and exposure to these social environments. The greater challenge will be institutional issues regarding policies and procedures around information and privacy. Faculty and students are beginning to see the value in socially networked learning spaces. Institutional impediments to the introduction of these social spaces within existing courses will continue to be a challenge. The pushback to these challenges may very well come from the pedagogy. If the concept of a dynamic archive can be seen to add learning value to the virtual classroom and if the most effective place for such a device is within a socially networked learning environment then just possibly the pedagogy will push the conversation and more online courses will be situated within such a social-networked learning environment.

Accessing, using, and seeing value in such an archive is a complex process, one with which both teachers and learners have limited experience. It requires a safe, supportive, and encouraging social and open environment: one that has been constructed to allow for growth in the individual supported by the many. There needs to be a clearly articulated common goal so that the learner understands the ground upon which they walk and learn. In this environment, individuals need to be able to learn how to recognize what can be found in an archive in terms of the subsidiary elements left beside

the figurative roadside, and begin to understand how off-hand or truncated thoughts, along with both well crafted and poorly written assignments, can add value to the learning process. Learners need to learn how the many disparate pieces of those who went before might offer value in the process of knowledge creation, the time and opportunity costs associated with searching these archives, and the critical capacity to evaluate their contribution to their own individual learning.

Learners also need to know that the knowledge creation process is at times just that, a process, and not necessarily a tangible object at the end of a path. Learners need to learn how to effectively interact with peers present as well as peers present only through their footprints, contributions, and traces left-behind. In doing so, there is much needed reflection to assist in the placement of these artefacts within the learning paradigm of the current learner while motivating learners to add and create something new as a result of this *leaving behind* process.

This complex process is neither created by chance nor left to run unattended. To be effective, this learning “place” (like other formal education structures and activities) must be consciously constructed and carefully managed, albeit quietly and gracefully from within, and at times from beyond. We often think of the archive as a garden that must be tended, pruned, and fertilized to create value. There must be a common understanding of the intent of the archive and the intent of the learning beyond the content. Learners need to know how to learn, how to create knowledge, how to share and work collaboratively, and they need to know how to be a part of the process, and how and when to effectively use this ever-evolving resource. There are different forms of archives. Different courses will need or use an archive in different ways, yet one of the



key lessons of this research is that regardless of the intent or how well crafted the environment is, the learner has to want to go there, there has to be a value proposition that speaks to the learner such that time and effort spent in the archive reflects value.

Thus a very summary design principle (McKenney & Reeves, 2012) for social networked online learning environments is that this environment can be an effective, supportive, and innovative space for learning and knowledge creation. As with any learning environment, care and attention, deliberate design, and understanding the needs of the learner are paramount. If we acknowledge that learning and knowledge creation are foundational elements in education, then creating the most appropriate and effective learning environment in support of these elements is key. This study shows that a socially networked online learning environment such as the Custom Elgg environment can offer the richness and flexibility needed to foster knowledge creation. The study does not directly show how to build this environment, primarily because the tools are changing and this aspect was outside the purview of my study. The study does show however, elements that need to be considered and integrated into any such future design.

My hypothesis, as stated in Chapter 3, is that an online archive, containing learning artefacts gathered from course section to course section, can offer learners an opportunity to stand on the shoulders of those who went before and benefit from prior lessons learned. Additionally in this hypothesis, I add that elements of knowledge creation theory (Nonaka & von Krogh, 2009) can be applied to this archive and supported within socially networked online learning environments. My data shows how some learners benefit from the archive and how elements of OKCT are threaded throughout.

These design principles are a direct outcome of this study and further support my initial thinking and hypothesis.

### **Implications for Further Research**

I chose a research methodology that is not necessarily ideal for doctoral study in that most design-based studies push the time limits demanded of doctoral studies. The Herrington et al. (2007) model, as was used to my advantage in my research, offers a foundation for a concise study and yet one that quite easily encourages further study. Ideally, aspects of my study should be redone again as a form of replication, and this time possibly within a different type of environment. This new study should still be about the creation and integration of an online archive; however, given a better understanding of the available tool sets and social environments, the archive should be more seamlessly placed within the environment and be offered to students over a longer time frame. The different UBC MET learning environments offer a possible perspective for such a study.

In many ways the Elgg environment used in my study is a luxury. Its rich tool set and controllable privacy are ideal for dealing with use-concerns raised at an institutional level regarding student-generated content, although I am not sure that this type of social environment is available at many universities as the desire to control many aspects of the learning process appear quite prevalent in higher education. Further studies need to be done using this rich social environment as an online classroom to allow others to see how the changing landscape of social environments and online learning are converging and can come together in a meaningful way.

Aspects of organizational knowledge creation theory should be used to support learning and knowledge creation in education and particularly in online learning. *Ba* is a

very powerful construct, and as shown through the many business management examples, it can and should be constructed and supported in learning environments. Garrison et al.'s (2000) community of inquiry model is an equally powerful model in support of learning and learner engagement. By combining this COI model and Nonaka et al.'s, (2008) five factors in support of the creation of *ba*, we could offer richness to learning environments beyond what we presently see. These two models come at the issue of engagement and interaction from very different worldviews yet they have a common purpose. One of the further reaches of this study should be an examination of these models in a way that either a new approach can be developed or that sufficient aspects of the two of these models can come together to support each other.

### **Chapter Summary and Final Words**

I ask myself if I had this project to do all over again, what would I do differently and/or what would I do the same. There is a mix of what I wish I had known and what I am glad I had to stumble through and figure out along the way. My understanding of research paradigms and methodologies is still a work in progress but I would have been better served to have been pushed to know more about these issues right from the start. My challenges with respect to learning environments such as social-networked learning spaces and their relationship to the more prevalent world of LMS is one that came about in a just-in-time fashion. I do not think I would have changed the way I encountered these challenges. There needs to be much more research done, not only into different learning environments, as discussed above, but into ways that students learn, given their exposure to the different technologies used in our daily lives. This is not just about the use of social networking tools but how these tools impact the learning process. I would

not want to change my relationship to my research participants. Being a part of the study helped me to better appreciate the world of the learner as they experienced it. I would like to believe that the inclusion of an archive in courses needs to become a more common occurrence and as this is introduced in the future, I would hope that researchers see merit in studying these phenomena.

This multi-year project began with the belief that lessons learned in other disciplines can be applied and fashioned in advantageous ways in education. We spend our lives moving in and out of different worlds and believe that our skills, our ability to interact with others, and our ability to survive across our multiple worlds is fashioned and informed by this capacity to bring from one world and shape another. I originally started this dissertation document with the words, “this document seeks to generate a conversation”. I hope that that this conversation has only just begun. The way we learn and the way we teach is ever evolving. The environments within which this teaching and learning takes place are also part of this evolution. My research is very focussed within the confines of one aspect of online learning. My data and my conclusions suggest that for my ideas to become more mainstream concepts, certain educational structural elements need to be changed and put in place. For now I think I will leave these recommendations alone. I would like to believe that the use of a dynamic learning archive built to support learning and knowledge creation in education and framed within the context of *ba* is something that will be realized in the not too distant future.

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## APPENDICES

## Appendix A - Athabasca University Research Ethics Approval

Athabasca University **Vice-President Academic**

**Date:** September 13, 2010  
**To:** Stuart Berry – AU DDE Student  
**From:** Margaret Haughey, Vice-President Academic  
**Subject:** Research Proposal

You have been approved to contact Athabasca University staff, students and systems for your research proposal “The Use and Value of an Online Archive” subject to the following conditions:

- Your research proposal has been approved by the Athabasca University Ethics Board (AUEB);
- Staff and student information is used solely for the purpose outlined in the research proposal submitted to the AUEB;
- Secondary uses of data or subsequent research proposal(s) will require additional approval of AUEB, permission of the staff or former staff, students or former students and institutional permission if the individual is still an Athabasca University staff or student;
- Staff and student participants will be provided with information about how information will be represented in documentation, reports and publications;
- Staff and student information will not be shared with a third party;
- The nature of communication with staff and students is that outlined in the research proposal submitted to the AUEB;
- Staff and students demographic information will be used solely within the research project;
- Documentation such as staff and student responses to questionnaires, interview responses (written or taped), observations of individual staff or student behaviors, etc. will not be used for any purpose other than that outlined in the research proposal submitted to AUEB;
- Staff and student information will be kept confidential until it is destroyed after a period not in excess of 10 years;
- Use of personal information will be in compliance with the **Freedom of Information, Protection of Privacy (FOIP)** legislation of the province of Alberta, Canada.

I wish you every success with your research project.

cc Research Ethics Board  
 Registrar

## **Appendix B - Interview Questions**

Having used the course archive as a resource over the past “X” weeks do you feel it has changed or altered the way you learn in this course?

Do you feel that the archive has added value to your learning in the course? If so please name any benefits you feel you have received as a result of your engagement with the course archive.

In your weekly discussions with your peers, how do you feel that your archive access has benefitted you in these discussions?

Does the semi-public access to your writings (your course peers, current and future) cause you to be more or less inhibiting with your writing? Does an audience, such as you in this course, inspire you to write differently or does it possibly cause you to be more cautious?

The social networking environment within which you have been working allows for different privacy settings. Have you changed you settings from the default, and if so, how has this impacted your contributions to the course discussions?

Knowing that your current discussions will become part of the archive for future learners has this changed how or what you say in the blog?

What types of issues or concerns inhibited your access and use of the archive? Please indicate if you feel that these issues might be related to the course and its design, your ability to access and use the archive or some other concerns.

### **Appendix C - Reflective Assignment**

Students are required to actively participate in the Custom Elgg blogging, Elluminate sessions and Custom Elgg community forums throughout the course. Your contributions are worth 10% of your course grade. I would expect that each student would post at least 3-4 blog postings reflecting on their reading, activities in the course, their own project etc. In addition I would expect at least one posting in response to the unit questions or edits to the unit question wiki. A final blog posting should be made that details individual contributions and perceptions of learning from this social software experience. Please document in this final post your own experience of learning to use an unfamiliar network tool.

Did the experience change your own sense of net efficacy?

Is the excitement of learning new tools, blunted by frustration of not knowing how to work the system?

What motivates (or de-motivates) you to post in your blog?

As a response to others' postings, in response to an instructor question?

What level of reading permission did you set for your posts? Why?

Are you likely to use The Custom Elgg after this course? After the Degree program?

Did you check out the bookmarked site left by others? Did you add your own bookmarks why/why not?

How much of yourself did you reveal in your profile?

Did you check the links to others to find common interest?

Did you find the tag cloud of posting tags of use? Did you contribute to the Wiki/Group Pages?

What is the difference between blogging and threaded discussions?

Did you regularly visit and search through the Custom Elgg Archive? What issues, concerns, or comments do you have with respect to the Archive and its potential value to you or future learners?

## **Appendix D - Email Inviting Participation in the Research Project**

Note: This email was the one sent to the second iteration of this study however this is identical to the email sent to students in the first iteration in September of 2010

This email is sent to you as a participant in CRS - We will formally meet this coming Wednesday the 12th of January

I would like to invite you, a member of the CRS Winter 2011 class, to be a participant in my doctoral research project. An outline of my project will be provided during the first online CRS class meeting (January 12, 2011).

I have appended below an informed consent document outlining my research and I would ask you to please respond to this email with the appropriate section of the consent document noted so that I have an official record of your acknowledgement.

Once you have acknowledged your agreement to participate in my research project please go to the Landing group named “Stuart Berry's Doctoral Research Project” and request access. This closed landing group contains additional documentation about my research as well as a detailed list of questions.

Thank You – Stu Berry

Stuart C Berry Doctoral Research

Informed Consent To Participate in Research

The second data phase of my research (the second iteration) will occur throughout the winter session of the CRS course (January – April 2011). Your participation and response to this one-question form provides informed consent to be part of this design-based research project. Please note that the CRS course instructor, acting also in the capacity of my research supervisor, will not have any access to any of the collected data

prior to submission of the final grades for this course. The research supervisor may, for research verification purposes, read comments in the raw data which will contain participant names however it is understood that the supervisor will be also bound to the same participant confidentiality rules as are outlined in this research document.

Participating in this research project in no way binds you to the research process. You retain the right to withdraw from the research at any time and without prejudice. Should you choose to withdraw from this research project, any or all of your direct research contributions will be removed from my data collection should you indicate so. This will enable you to participate in the CRS group Custom Elgg discussions but not be included in the research data used in preparation of my Doctoral dissertation. All data provided by willing participants will be used anonymously within this research project.

#### Informed Consent:

Your response to this question is required in order to accurately record those who wish to participate in Stuart C Berry's doctoral research. Everyone is expected to participate in the Custom Elgg CRS course group, however, only those who clearly indicate the "I Agree" choice, indicated below and return the email with your answer clearly indicated, will have their contributions (recorded separately) included as research data for this doctoral research project. Participants are asked to return their response with 7 calendar days from the date of the email.

I agree to participate in Stuart C Berry's doctoral research project as outlined throughout this document and allow my contributions to be used in Stuart C Berry's doctoral research as outlined in this PDF document sent via email to all fall 2010 and winter 2011 participants of CRS on date.



A copy of this PDF will also be available for viewing, as an attachment, within the Custom Elgg CRS group. The University Research Ethics Board has reviewed this research study and may be reached by e-mailing [email address removed] or calling [phone number removed] if you have questions or comments about your treatment as a participant.

Please save a copy of this document, key in your full name in only one of the two places below and return to the researcher within 7 calendar days from the date of this email

I ( ) Agree to Participate in Stuart C Berry's research

OR

I ( ) Do Not Agree to Participate in Stuart C Berry's research

Please key in today's date: ( )

Thank You

Stu

## Appendix E – Data Sample from Iteration One

December 12, 2001

Final reflections

Hey everyone. Just posting my final thoughts of CRS as per the questions found on the course site.

My Custom ELGG experience has been an interesting journey for me. My initial thoughts were that of confusion and dislike. This was my first course on the Custom ELGG, and after having completed most of the degree program via the use of Moodle, I was resistant to the change. I was excited to try another learning tool, but for some reason, it started off on the wrong foot as I had difficulty navigating around in the Custom ELGG. The idea of using an archive was exciting but, trying to find things was very frustrating (at the outset of the program).

Blogs vs threads: The one part I found very interesting is Blogging. The use of blogs is an interesting form of learning as it allowed myself and other classmates to post their ‘personal’ reflections about how the course is going, Custom ELGG experiences, assignments, etc in what I view, a less formal setting. Threads felt more of a formal classroom setting in which students posted a response to the questions, while blogs can be used just for random thoughts.

Motivation of blogging: Most of my motivating factors to post Blogs were assignment writing difficulties and feedback received from corrected assignments. Although, I did post some of my frustrations with the Custom ELGG on there .

Archive: Did I find it of use? Not really. I used it a few times to get an idea but I did not find other people previous assignments much use to my scenario. I am not saying an archive is a bad thing, I just did not find it useful to me.

Bookmarks, etc: My view is totally opposite of bookmarks. Although I did not post bookmarks myself, I found what others shared useful. Many thanks to those who did cause it was often a good starting point if I found myself at a roadblock. This feature is an excellent tool as it was an easy resource to use (similar to FAQ).

Conclusion: Although my outlook is not all that positive about the Custom ELGG, I started to find it useful at the end. I was not as active as I wanted to be this course, so maybe that is why my initial outlook can probably directly correlated to my personal level of comfort with navigating through it. Would I come back to it? Yes I would. I only have once course to go (plus that dreaded e-portfolio I have been delaying), and will probably do a visit or two after I am done the programme.

Thanks for the learning experience.

SCB-01

November 24, 2010

Unit 5 Reflection

Particularly enjoyed the readings this week wrt change management strategies. The initial quote made by Alan Kay sums it up pretty clear on how my organization works: "Change is easy, except for the change part" (Kay as cited by Rosenberg, 2006, p.255).

Rosenberg (2006) presented thirteen change management approaches. One in particular I feel is crucial: Get leadership onboard early. I have personally lived this

experience for the past couple of years which have recently resulted in hard efforts go to waste..... Without going into too much details, not all of senior leadership bought into our concept of new curriculum changes, except the "big boss". New initiatives were put into the curriculum (of which my development team spent months and months of work) and actually were implemented, despite senior management overall dislike of it. But the moment the big boss left and new leadership took over, needless to say, the new curriculum was found to be not fitting into the new Vision of the TE. Funny that, oh well,

Comment:

Funny not in a ha-ha sense but in a why don't people talk to each other sense. When your one supporter goes then people can kill you implementation plans regardless of the hours of time, effort and money that has been spent to create them. What I find frustrating through all of these types of processes is no-one really gives the curriculum and reasonable chance for success.

SCB-11

That point struck me as well in Rosenberg's chapter on change management. Right now I'm trying to brainstorm how to get my leadership on board early for my business proposal. It's not just a matter of giving them my business plan; I really think I have to be strategic (there's that word again!) about who I talk to and when. And I have to SELL the idea - I'm not a natural salesperson so this is going to be my challenge.

SCB-04

SCB-04, I'm in the midst of preparing to facilitate a negotiation skills course at work, and your comment caught my eye. Sounds like you need to negotiate. You say

that you're not a natural salesperson, and I would guess that you would also say you are not a natural negotiator? The two usually go hand in hand.

The funny thing about both selling and negotiating, is that entering into a sales relationship or entering into a negotiation involve entering into a "conflict zone". Most of us are not too crazy about conflict, myself included. Recognizing that conflict is what makes me uncomfortable, more than selling or negotiation, has helped me to improve my negotiation skills. The key is to look for common interests and approach the negotiation from a collaborative tact. Make a list of what you want (or what your proposal would bring) and make a list of what your leadership want. Hopefully you share some common interests, and that's the place to start selling.

SCB-07

November 11, 2010

Assignment #2

Well, getting close to completing assignment #2. Again, this has been a challenge! I have had the chance to read several posts made by classmates (all very helpful), and looked through past assignments on the Archive. I am a little concerned as I took a different approach with the numbers for this assignment. Working for a government training establishment, making a profit is not a concern. The way I did my financial tables was to show the projected costs for baseline funds, we would require to get approval from a higher organization. I also showed the price of students slowly reduces each year this DL enterprise is in operation.

Hopefully I was on the right track! Will find out.....

SCB-01

October 31, 2010

Assignment #1 Audio Feedback

Just received feedback for assignment #1. I am really impressed with the use of audio feedback provided by SCB-27. The use of inserting audio commentary allowed me to have more in-depth thoughts of the professor, enhancing the feedback experience. It was as if I was sitting in the same room receiving a performance review at the same time as he was going through the assignment (although I could not provide a rebuttal !! (smiley face icon)

It is something I would really consider using.

SCB-01

Comment

hi SCB-01, I also found that the audio feedback gave an extra dimension. Good luck on the next assignment.

SCB-05

Audio feedback is really excellent. Although I haven't gotten mine back yet as I was late handing it in. In every course where audio feedback is given that I have taken I have found it to be really excellent. I like talking to my students personally about their mark and listening to their point of view. I think the marks are much more accurate.

SCB-11

October 25, 2010

Assignment 1 Woes

Having just completed assignment 1 last week, I must admit it was tougher than I thought. Who knew that even following a well laid out template would cause so much grief.....

Comment

Isn't it funny when you think you have an understanding and then you are off. Well SCB-01 onward and upward to assignment 2.

SCB-11

I agree SCB-01...it was tougher than I thought it would be. The template was a great guide, but I added way too much in my original draft (marketing strategies, financial projections) and was getting overwhelmed. I trimmed many pages off of my original submission and am very thankful that I saved them as I think I will be able to use it for Assignment 2!

SCB-06

September 29, 2010

Learning Journal - CRS Experience

Hi everyone:

I just had the opportunity to read a post by SCB-27 that has put my mind at ease with respect to the expectations of essentially Assignment #4 - class participation. This has led me to start blogging about my experiences with course assignments and experiences to date. My first entry is about assignment #1. My business plan is based on a real scenario involving my current workplace. It is involving the discussion of creating a Distance Learning section within our school (which I have chosen the name of Dept of Online Education - still not sold on what to call it yet. If anyone has ideas, the

wackier the better, please do share!). This project is now being seriously considered for our Training Establishment (TE) based on the current demands by external stakeholders to offer more "efficient" training delivery of new initiatives being offered at the TE.

Fortunately (or unfortunately -- I guess I can look at it either way ), I am taking CRS at the same time. I presented this 'opportunity' to my boss of receiving a gratuitous BP for this idea, and he absolutely loved it. Free labour!!!! Now do I not only have the pressure of completing this for the course, I guess I cannot BS things if I have to give a copy to the Boss!

YIKES !!! (surprised smiley icon)

Wish me luck!

SCB-01

September 27, 2010

Posts, Posts, and More posts !!!!!!!!!

Whew, back from vacation for a week, and OMG!!!!!! This place is full of posts. Going through them inspired me to write a quick blog (or a rant) on my thoughts about the Custom ELGG.

This site is being used as our virtual classroom for CRS, and so far, it has been quite the experience. I personally am starting to find this a little overwhelming....not necessarily with the sheer volume of student posts (good active participation in the class), but mostly with the navigation thru it. For instance, on the group Main Page, it only highlights a quick link to the 'latest' discussion threads.....but by the time I get through those, I forget to go back and look at all the other discussion threads. Quite honestly, I



forget about them anyway or fail to read important information that may have been passed on because of my inability to keep up with them (as it is not highlighted anyhow) as it is probably "old news" at this point, or the discussions have just died.

With my previous courses, at least I could see all discussion threads on the one page in Moodle without extensive navigation, including how many posts I had yet to read. I know in the Custom ELGG, it is only a few additional clicks compared to Moodle, but this 'clicks' may get forgotten depending on the number of posts I have to read with the highlighted threads. As a result, I forget to read a post and pose stupid questions which were already answered by the prof at a post I missed because I did not click to view all blogs, for an example.

I know I am venting. I could be the only one that feels this way. I just wanted to express my opinion on my Blog. I welcome any feedback from others!

Cheers,

SCB-01

Comment

SCB-01, you are definitely not alone in this feeling. I was worried about this when I first discovered the structure of the CRS discussions in the Custom ELGG (see <https://...>). And now I am returning to CRS in the Custom ELGG after more than a week's absence due to a death in the family. I almost cried when I saw the number of posts that I had to catch up on. As you might already know, JH gave some suggestions on how to deal with this frustration here, but ultimately I think we all want a solution where our ability to follow, discuss, and network is maximized by the structure, instead of exacerbated by it.

We are being pushed to act as early adopters, which certainly doesn't suit everyone's learning style. So long as I know that we are part of a bigger goal - a goal of making social networking and DE instructional design more complementary - I'm willing to give it a shot. But no, like you, I won't do it silently... ;)

SCB-04

SCB-04:

Thanks for the feedback. As you said quite well, I understand we are part of a bigger goal, I just hope I can keep up!

SCB-01

Hi SCB-01 & SCB-04:

I, too, feel like ranting or crying (depending on my mood). I am totally unfamiliar with this learning platform and am finding the navigation a little trying. I don't even have a Facebook page! Oh, oh giving away my age.... In saying that I do love to learn and am all for new technology & the many benefits it brings. However, I do prefer to think about things & do some research before I respond/post & that takes time that I don't always feel is available in these degree courses.

I completed another course in this program and found that although the sheer volume of discussion posts necessitated daily checking at least I had a quick visual to let me know where I needed to go to check the latest posts. Don't get me wrong I much prefer distance learning but also appreciate a clear visual path to follow as opposed to a search & discover method.

Okay time to stop my rant & get one with trying to find my way around this platform. Not sure how successful I will be as I am also feeling the pull of Thanksgiving preparations. Oh well, c'est la vie.

Later.

September 15, 2010

Unit 1 - Personal Reflection Activity

Within your own organization or work environment, what distance education opportunities currently exist; what is needed in the future; and what type of distance education and distributed learning services will be needed to maximize these new opportunities?

I currently work in one of the largest Training Establishments (TE) in the FF. My TE offers three national qualifications, none of which are currently associated with e-learning. With elementary leadership and basic training, it is hard to depict the effect DL would provide in one of our classrooms (imagine living the first 30 mins of Full Metal Jacket but online - does not nearly have the same effect as F2F!!!!).

Saying this, 2 new initiatives / curriculum's have been given to our School, followed by a strong push to utilize different delivery methods for them - e-learning is at the forefront. This is unfamiliar territory for my School and I find this as a golden opportunity to catch up with the times (especially being an degree student). Personally, I am going to use this course as a "trial" by using this scenario as base for the three assignments in order to see if it is actually feasible to develop an e-learning 'enterprise' within. As well, i look forward to hearing your experiences / thoughts and will definitely look forward to your comments.

## Appendix F – Data Sample from Iteration Two

April 9, 2011

Assignment 4

Blog Postings

My experiences of learning to use an unfamiliar network tool.

1. Did the experience change your own sense of net efficacy?

I would have to say not really for the better. If anything, I found it a bit frustrating to locate certain things in the Custom ELGG, which made me feel as if I'd wasted a bit of time looking. On several occasions, a google search was more effective, and on some occasions it actually pointed me to an address within the Custom ELGG that I couldn't locate while in the Custom ELGG. Sometimes I did an exact search in the Custom ELGG, using the archived item title, and couldn't find it. I would say that I think the problem stems from the fact that there is almost TMI on the Custom ELGG (too much information), and when you're swimming in an ocean instead of a backyard pool, its much easier to lose your bearings.

2. Is the excitement of learning new tools blunted by frustration of not knowing how to work the system?

I didn't really find the Custom ELGG difficult to understand, because I'd been using Me2U prior to that, and had actually started my eportfolio there. When the Custom ELGG was created, I simply transferred everything over to it. If anything I'd have to say that it was not me who couldn't work the system, but the system itself that didn't work for me. So it was frustrating at times, to know something was out there, but because of Custom ELGG limitations, be unable to find it. It may be because the

Custom ELGG is not specifically designed as a learning management system, but we were using it as if it was one when that is not its intended purpose.

The concept of the archive, however, is a very valuable one, but I do not feel that it has been executed as well as it could be if it is to be used for learning purposes.

3. What motivates (or de-motivates) you to post in your blog?

I'm not really a blogger. Well, that's not entirely true, I do have a small personal blog where I discuss things that are free on the internet (mostly software, or other services I've found that are useful), in which I review and rate the thing I've found. So its pretty straightforward, and I do it when I feel like it or have time. I do read certain blogs on the web, and have to say, it seems to be different kind of writing, or an art form and a skill set that I haven't yet acquired.

Having said that, this is the first time I've had to do it for an assignment or for participation marks, or any other educational purpose. My biggest concern throughout this semester, is that I felt I didn't have much to contribute to class discussions because my background or current job is not in education. My blog posts on the Custom ELGG are more opinions or what I'm thinking during an assignment or after its submission than they are facts. I'm not sure how much value they will be to others, but contributions to it make up a large part of our final grade, so I will contribute to the response, and hope I haven't just shot myself in the foot by admitting that!

4. What motivates (or de-motivates) you to post in your blog as a response to others' postings or in response to an instructor question?

I haven't done that, I'm more inclined to respond to a discussion post in a group discussion than I am in someone else's blog. I would attribute it to a lack of time to

contribute to so many different blogs or discussions, and when that is coupled with my belief that I have nothing to say, it wasn't something I did very often. I've only seen a few blog posts anyways from people I'm following in CRS, so if anyone else's permissions are set differently than mine, or I am not following them, I might not even see their blog posts.

5. What level of reading permission did you set for your posts? Why?

I used the system default which set it to "Logged In Users". No particular reason, I didn't realize it was a setting that we could change. Since it makes up part of our assignment, I'm glad the default value permitted that, even though to date, the only response to my blog posting I've ever received in the Custom ELGG was when I took my first course in September 2009.

6. Are you likely to use The Custom ELGG after this course? After the Degree program?

For another course, if it is required, I will, otherwise I may try to find items in the archive that could help me with future assignments and hope I could find something. I definitely will not use it for my eportfolio, as I've migrated to another site to do that. After I finish the program? It's hard to say, but likely not. Its seems a little underdeveloped and awkward at the moment, but if it gets better and has features I actually will use, then maybe! Portability and ownership of our content, is an issue that I'd need to have addressed.

7. Did you check out the bookmarked sites left by others? Did you add your own bookmarks why/why not?

I always check anything that comes in my Custom ELGG inbox, so if any were posted, I would read the inbox message, and if the link was relevant to me, I'd have checked it out. I think I did add a couple of links to some sites at some point, but I did it in the group discussion area, not in a bookmark.

8. How much of yourself did you reveal in your profile?

Quite a bit actually, about the same as what is revealed on my facebook page, minus the "friends" part. For my job I am often in peoples homes, and many of them have pets who get super excited when I come to the door. I always say to them, and will say it now regarding my profile – "I'm really not THAT interesting!!"

9. Did you check the links to others to find common interests?

If it came up in discussions that I shared a common interest with anyone I'd certainly participate in the conversation, but I already feel I have something in common with everyone in the Degree program, and that's enough for me. I really didn't make a point of checking out anyone's profile while in the Custom ELGG.

10. Did you find the tag cloud of posting tags of use? Did you contribute to the Wiki/Group Pages?

In general I think this was one of the biggest weaknesses in the Custom ELGG. I eluded to this in a post to Stu Berry about it, saying that the search engine in the Custom ELGG is not sophisticated enough to recognize that the tags Degree CRS and degree CRS and DEGREE CRS are really the same thing. If the Custom ELGG had a list of tags that one could choose from, and some way to identify archived items from the document name, the search function would be greatly improved. Often times, google would find it when the Custom ELGG couldn't.

The group pages didn't seem much different to me than the group discussions, blogs, activities, or all of the other things the Custom ELGG could let you do. I didn't even realize that there was a wiki for this class, and don't recall seeing anything about one in my inbox.

11. What is the difference between blogging and threaded discussions?

I'd have to say that the thing that strikes me as most different is that on Moodle, I could respond to an individual component of a threaded discussion, in effect creating a "mini thread". This enabled others to see the discussion, and participate in several mini discussions without having to skip to other discussions. I can't comment on how blogging would work in the Custom ELGG because nobody except Terry has commented on my blog posts!! I liked the chronological order better in the threaded discussions too, it read more like a book, and I wasn't scrolling so much to see discussions. General group posting in the Custom ELGG doesn't seem to permit me to do that. Getting a "digest" version of the day's postings from Moodle (a time saver) was a feature I really missed not having in the Custom ELGG.

12. Did you regularly visit and search through the Custom ELGG Archive? What issues, concerns, or comments do you have with respect to the Archive and its potential value to you or future learners?

I will say that I do like examples of assignments, and being able to find them on old version of Custom ELGG and later the Custom ELGG was somewhat helpful. But given the tagging issues I mentioned above, I have to wonder how many more documents are available in the Custom ELGG archive that cannot be found because incorrect or ambiguous tags were assigned to them, or I entered the wrong search criteria. If the



document owner's permissions restricted access to them, It doesn't matter how many items are in the archive, if nobody can find them, it seems somewhat pointless to have them at all, and if they can be found, how do we separate the good examples from the bad ones?

I would liked to have seen search results returned in order of relevance instead of reverse chronological order. For example entering DegreeCRS Assignment 3 in a search box returned me anything (files, blogs, pages, posts, etc.) that had one of those criteria which meant I was receiving tons of data that was not relevant to me from other courses, and even other programs. We have come to expect sophisticated searches that seem to do our thinking for us because of our daily use of google and other search engines. Sometimes, the Custom ELGG felt like a step back in time. None the less, I have posted all of my assignments on the Custom ELGG since I started the MDE program, and hope they will be of value to someone someday, as the items I found were of help to me. I tried to make the file names as clear as possible, and use the right tags, and just hope that some like minded individual will be able to find them.

March 29, 2011

It's down to the final assignment for CRS, and I was a little leary of what I could do, given that my DE enterprise is an organization of one (me!). The Rosenberg text changed all of that for me. I had created a small instructional unit for CRS-1 and had it reviewed by one of my classmates. After it was completed and suggested improvements and corrections were made, I decided to make it available to several of my clients who had expressed an interest in learning the trade. I was able to set up new userids for them

and asked them to go through the course. I did the same for a few colleagues with various training backgrounds. There were two music teachers in the group as well.

Voila! Instant focus group!! Rosenberg discusses this as a method of getting early adoption and its what I'll be using, since my course will not succeed unless there is external acceptance and understanding and finally preference of this method of instruction over the traditional offering available.

Let's hope the "six degree of separation" rule holds true for me, hopefully word will get out by the time I go live with the course in September.

March 14, 2011

Well its the Monday after a Sunday assignment submission, and its always my most favourite time in any course.

Knowing that I can move onto something new, even if it requires an about face, is something I look forward to. Even though we were given an extra week's extension for submission of this part of our business plan, I did my best to stick to the original deadline.

I've always been against procrastination, and an extension just seems to give me more opportunity to do so. I normally work best under pressure, and even though I try to evenly pace the work on any assignment, I always seem to do the best work in the last few days, like my brain is kicking into high gear.

This course, more than any others I've already taken, has so far been lots of ups and downs. Initially I believed I was like a fish out of water and was worried I couldn't possibly grasp the first assignment. Much to my surprise, based on my grade, I must have gotten something right! The second assignment was like a trip down memory lane,

recalling the many financial statements I had to complete for my business degree. It was the first time since starting my Degree, that the readings were something I could read once and understand. I had no trouble connecting the dots for this unit.

So I will enjoy a few days of assignment free bliss, and commence readings for the final two units. I haven't looked at number three yet, but look forward to the challenge.

January 13, 2011

In each course I've studied so far, I've been able to complete the assignments with subject material that has been of interest to me. I am a self-employed pt technician in O. In CRS-1 I was able to create an introductory module in P Technology. My ultimate goal is to be able fully develop the course and offer it at a private institution.

The current offering in Canada for this program is limited to one privately run institution in X,Y. Those wishing to take the course must make sizeable financial and personal sacrifices to pursue this career, and are required to leave gainful employment or relocate to London.

What I'd like to propose for the assignments for this course is to create a new distance education enterprise for a school of piano technology. This will give anyone interested in this career the opportunity to study at their own pace without leaving their jobs or moving to London.

All offerings in North America are at private institutions, and there is one correspondence course offered in the United States. It is a very popular course because of its individual study pace and relatively lower costs.

A similar type of program does not currently exist in Canada. A distance education enterprise offering this subject would make it possible for more individuals considering this career to follow their dream.

Regards,

## GLOSSARY

In the literature review chapter, I provide a more in-depth discussion with regard to certain terms that may appear ambiguous or their use may infer multiple meanings. In this glossary I outline the context and topic-specific meaning for some of the terms used throughout this document. This glossary is meant to describe, as finely as possible, my use of the term.

### **Archive**

The word *archive* is “a place in which public records or other important historic documents are kept... [and an] historical record or document so preserved” (Archive, n.d.). The origins of the word go back to the Greek “archon,” or ruler, and the *archive* was the place where important documents were kept (Liddell & Scott, 1940). At times in my discussions with the students in this study, I use *archive* to mean “the place,” while at other times I mean “the historical record”, as in the corpus of all that was collected. For purposes of this dissertation document I use the *Oxford English Dictionary* (OED) as my source of meaning for this terms. I trust that throughout this dissertation document the reader will be able to distinguish between the place and the collection. I perceive the archive, the place as the home of the collection.

### **Artefact**

As specifically defined and intended by my use in this study, I see an *artefact* as “an object made or modified by human workmanship” (Artefact, 2008). The word *artefact*, spelled with an “e” instead of an “i” (Artefact, 2008), is the more common English usage, and the one I use throughout this document. The word *artefact* comes

from the Latin “art - skill in doing something, esp. as the result of knowledge or practice,” and “factum - a thing done or performed.”

## **Ba**

The word *ba* describes a context where one participates in and observes interactions from the inside. When we socialize, for example, we may allow ourselves to become completely immersed in the conversation of the group to the exclusion of elements outside of the conversation. One is then considered to be in *ba*. Shimizu (1995) attempts to describe this term with an analogy of two people in the same house where one of these people is the homeowner and the other a visitor. Although both see and smell and hear the same things in the home, in many respects the homeowner is in a different world from the visitor because of his or her intimate appreciation of everything in the home. The visitor may not be part of this *ba*. To bring people into a common *ba* there needs to be this shared context of understanding (Nonaka & Konno, 1998).

## **Conversation**

The word *conversation* is intended to mean an “interchange of thoughts and words” (Conversation, n.d.), as described in the Oxford English Dictionary (OED). These thoughts and words could be conveyed orally or through other means and they could be formal or informal. Other definitions suggest that conversation must be informal and must be oral; however, I use the word as indicated above from the OED with no inference of oral or informal.

## **Explicit Knowledge**

Explicit knowledge is the outward, visible expression of that which we know (Kirsh, 2010). It is the articulated portion of our knowledge and in this sense the word articulated can mean anything from that which is written, to physical objects created, or explicit can even appear through a gesture or vocal expression. Throughout my document the word explicit can mean, within context, any of the before-mentioned and explicit knowledge means the articulated form of knowledge as defined here.

## **Knowledge**

We need to understand what we mean by *knowledge* if we hope to create environments in support of the creation of *knowledge*. A broader discussion about *knowledge* occurs in the literature review chapter; however, a working definition within the context of this document needs to be created. Throughout this document, the word *knowledge* is primarily referred to as the act or the process of creating *knowledge* (Cobb, 2007, 2008; Whitehead, 1985). These are the unique understandings we acquire and *knowledge* is seen as the product of these understandings. The *knowledge* process is as much a product as is the end state of the process. In other words, knowledge can be seen to be as much a verb (creating) as it is a noun (the created).

## **Online**

*Online* refers to using the Internet to communicate, access, and use resources, shared or not, by whatever technological device available. I use the word online throughout this document to primarily identify the means by which students use to communicate with each other and access an environment within which teaching and

learning occurs. I do not intend to use the word online to include face-to-face, in person communication, speaking to someone using the telephone (mobile or otherwise), using the fax machine, or using postal mail.

### **Scaffold**

The term *scaffolding* in a Vygotskian, education sense assumes that the teacher creates aides (*scaffolds*) for the learner, and when the learner has acquired an appropriate understanding the aides are no longer required. “Instructional scaffolding builds temporary structures” (Leon, 2012, p. 145; Applebee & Langer, 1984). It is these temporary structures that I refer to by using the word *scaffolding* throughout this document. I see these as internal mental devices similar to Vygotsky’s aides, but in the context of this document, *scaffolds* are mental structures or forms upon which and from which we are able to internally connect and then hold our new understandings. In formal education, scaffolds are normally constructed by the teacher or by more learned colleagues. In this study I strive to see how the scaffolds constructed by other students, as well as teacher tools and comments, and interactions of all, are used as scaffolds to aide in knowledge building and skill acquisition.

### **Social – Social Network**

Throughout this document I use these words together (social network) and individually (social). The word social is meant to infer the relationships between human beings. When, for example I refer to the social construction of knowledge I mean that knowledge is constructed as a result of the interactions and relationships between humans. A social network (generally prefaced with the word *online*) is meant as a



network of relationships and interactions between humans using some form of dedicated online technology (ICT) where these interactions can occur.

### **Tacit Knowledge.**

The words *tacit* and *tacit knowledge* are widely used in the current lexicon of both business and psychology. However, their use as common terms only came about in the past fifty years. Michael Polanyi (1967, 1974) introduced the concept of *tacit knowledge* as an idea that “we know more than we can tell” (Polanyi, 1967, p. 4). This is a form of intuitive understanding that is difficult to articulate, and best shown through things we do rather than in any explicit or tangible way. *Tacit knowledge*, by itself, is not a visible thing. *Tacit knowledge* is more an understood form of knowledge than something visible or explicit. In the context of this document and study I am suggesting that scaffolds (defined in this glossary) can be the visible remains of the process of creating *tacit knowledge*, and these scaffolds become the artefacts in the online learning archive. Evidence of this *tacit knowledge* is made available through daily use of and interaction within online learning environments.

Another way of looking at *tacit knowledge* might be to use a dinosaur analogy. We search for evidence of dinosaurs not necessarily by looking for dinosaurs but by looking for evidence of their existence at some point such as footprints or fossilized bones. Dinosaurs may not exist today but there is evidence of their existence in a similar way that there can be evidence of *tacit knowledge*. We do not necessarily know that someone possesses *tacit knowledge* but we may be able to see evidence of this through the constructed phrases and words left behind in a conversation such as truncated

thoughts and complete or incomplete attempts to articulate an idea. These articulations are the evidence: the footprints.