Persistent Artefacts in an Online Classroom: The Value of a Dynamic Learning Archive

Artefacts persistants dans une salle de classe en ligne : la valeur d'une archive dynamique de l'apprentissage

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Abstract

This paper summarizes a multi-year research project that examines the use and value of visible and persistent artefacts within an online learning environment. This study is framed within elements of a business management theory. Changes to an online learning environment are documented as well as an examination of the impact of these changes on the learning process. The study also shows the impact of learner engagement with artefacts over the life of multiple iterations of a course within this socially networked online learning space.

Two significant outcomes emerged: 1. How the use of a socially networked online learning environment can offer a rich and supportive place for teaching and learning; and 2. That students in this study support the inclusion of an archive containing artefacts from learners in prior iterations of a course. The connection between the inclusion of this archive and the impact of a socially networked online learning environment will be demonstrated throughout.

Resume

Cet article résume un projet de recherche sur plusieurs années, examinant l'utilisation et la valeur des artefacts visibles et persistants au sein d'un environnement d'apprentissage en ligne. Cette étude a été structurée selon des éléments d'une théorie de la gestion des affaires. Les modifications à l'environnement d'apprentissage en ligne sont documentées, ainsi que l'examen de l'incidence de ces modifications sur le processus d'apprentissage. L'étude montre aussi l'impact de l'engagement de l'apprenant avec les artefacts sur plusieurs itérations d'un cours dans un espace d'apprentissage en ligne doté de réseaux sociaux.

Deux résultats importants ont émergé : 1. un espace d'apprentissage en ligne doté de réseaux sociaux peut offrir un endroit riche et soutenant pour l'enseignement et l'apprentissage; et 2. les étudiants dans cette étude sont favorables à l'inclusion d'une archive rassemblant les artefacts d'apprenants des itérations préalables d'un cours. Le lien entre l'inclusion de cette

archive et l'impact d'un espace d'apprentissage en ligne doté de réseaux sociaux sera démontré tout au long.

Introduction

Most post-secondary online courses occur as isolated events. Apart from the continuity of the instructor, class assignments, and the base content, each new section of a course is, in essence, a new event, which generally does not contain artefacts from students who participated in earlier sections. This paper outlines the results of a research study that examines the potential use, and value of, retaining artefacts within a course archive from current and prior students and making these artefacts available to students in subsequent iterations of an online course. The underlying assumption: students are denied access to a rich and dynamic learning resource by the act of removing all prior student contributions to previous course iterations. The new course shell is wiped clean of past student artefacts. Through the use of a design-based research (DBR) model, this study examines the use and value of persistent course artefacts by altering an online course, retaining, and making available these artefacts for current and future learners.

Oakeshott (1989) suggests that the value of a conversation, "lies in the relics it leaves behind in the minds of those who participate" (p. 60). Although some might suggest that what goes on in an online class is much more than a conversation, it can be argued that the rich exchanges that occur within an online class can be seen in a fashion similar to a conversation. Thus, there may be value in re-examining these physical relics in the form of student artefacts left behind at the end of an online course: "Artefacts range from asynchronous discussions, blog posts, synchronous meetings, and other recorded interactions, to assignments or draft documents that learners leave behind as they work through their learning and their construction of knowledge within any given online course" (Berry, 2014, p. 122). There are reasons why courses begin in a clean or sanitized state; however, these reasons were not investigated in this study. Instead, this study focuses on examining the use and value of the inclusion of course artefacts in online courses as described above, in addition to the potential issues or concerns that students may encounter as they access or use the artefacts, working within the encompassing archive.

The study is supported by a business management theory known as organizational knowledge creation theory (OKCT) (Nonaka, 1994; Nonaka & Takeuchi, 1995; Nonaka, Toyama, & Hirata, 2008), which is used to examine the process of knowledge creation, student interaction, and the results of these processes. 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). The study attempts to re-image parts of this theory to help show how aspects of knowledge creation processes in a business management context might be mirrored against a similar environment in the online education setting. Two key aspects of OCKT play a part in this study and help to bridge two seemingly disparate domains: 1. The interplay between tacit and explicit knowledge; and 2. The development of a contextual environment known as *Ba*.

DBR is used as the study methodology as this offers the researcher the opportunity to be both the designer and researcher while taking an active role as a member in the project (Wang & Hannifan, 2005). Elements of this study have a certain Autoethnographical component to them in that much of the study is a reflection of the author's attempt to navigate his learning processes

throughout the course of this research. DBR aims to affect environmental change while developing practical theories that work in the real world (Barab & Squire, 2004). Usable design principles are developed through the construction, inclusion, and use of an archive in an online learning environment.

Although in many respects, research questions within a DBR project can be seen as a moving target (Herrington, McKenney, Reeves, & Oliver, 2007), the three main questions guiding this research project help to maintain its focus. In a truncated form, the three main questions are:

(1) In an online distance education setting, how can the process of knowledge creation be supported by the use of a digital archive?
(2) What perceived value do these archives offer current learners?
(3) Are there perceived barriers to the use of these archives?

At the conclusion of the course there are follow up interviews where students are asked a series of questions which expand upon the three basic research questions. These follow up questions are a synthesis of issues that were pervasive throughout the course. Both the researcher and the study participants use these questions as a means of circling back and reflecting upon the archive and its potential value.

"The primary practical contribution of educational design research is the intervention developed to solve a real problem in practice" (McKenney & Reeves, 2012, p. 41). The intervention in this study was not just the addition of a dynamic archive within an online learning environment but a recognition that the nature and type of learning environment matters. This second issue regarding the nature of the learning environment came about early in the study design. It was acknowledged that a learning management system (LMS) commonly used by most educational organizations would not permit the archiving and subsequent sharing of student input from one section of a course to another. LMS are not designed to be open environments since most institutions view LMS as closed, one-off containers for single sections of a course. Mott (2010, para. 6), describes LMS as "primarily a tool set for administrative efficiency rather than a platform for substantive teaching and learning activities". The issue of the learning environment was studied and became a part of this project through the on-going investigation into the nature and use of an archive.

The university within which this study took place, provided an open-source social networking platform known as Elgg (About, n.d.). Elgg offers an "environment with user-controlled, permeable boundaries where individuals can gather, search, and share resources and hyperlinks, and where permanence and persistence play a key role" (Berry, 2014, p. 23). This social networked learning environment presents a number of unintended consequences for this study allowing for a greater connection to the study's underlying theory. Elements of knowledge creation theory (Nonaka & von Krogh, 2009) are applied to this intervention and the study shows how this theory can evolve to support socially networked online learning environments.

Demographics of Study Population

Table 1

Study Demographics (Berry, 2014, p. 161)

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 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

Literature Review

The first four literature domains (knowledge creation; *ba*; tacit knowledge; and, reflective practice) examined in this research were initially chosen to reflect the focus of the study. In the corporate community, knowledge and its creation are seen as competitive resources (Nonaka & Takeuchi, 1995) and within the sphere of OKCT, knowledge is believed to be created within a Japanese philosophical context known as *ba*. The Japanese word *ba*, is loosely translated to mean space or place (Abe, 1988; Krummel & Nagatono, 2012; Nishida, 1990; Nonaka & Konno, 1998; Nonaka, Konno, & Toyama, 2001; Shimizu, 1995). Nonaka and Konno (1998) positioned *ba* to be at the nexus of people working together in a common endeavour with the belief that it is within, and as a result of *ba,* that knowledge is created. In a similar way, *ba* can be created in an online world to support learning and knowledge creation. This study attempts, in part to observe the creation and effects of *ba* as students interact with each other and with the contents of the archive to create new knowledge.

Polanyi (1967, 1974) introduced the concept of tacit knowledge into our lexicon and argues that all knowledge is rooted in tacit knowledge. He goes further to describe knowledge in terms of focal awareness and subsidiary awareness where focal awareness is that which we see

and know (explicit knowledge) and subsidiary awareness is, that which guides us peripherally (tacit knowledge). By engaging in an online archives containing artefacts from prior students, current and future students have an opportunity to be both focally aware (finding and using explicit objects) and aware in a subsidiary way by engaging with the truncated thoughts and writings left in the archive. This second part is a subsidiary engagement with the expressions of tacit knowledge left by prior students.

de Haën, Tsui-Auch, and Alexis, (2001) suggest OKCT is "inherently social" (p. 904). Knowledge creation is also seen through the lens of a model supported by OKCT and this is referred to as the SECI model (Nonaka & Takeuchi, 1995). This acronym refers to the words: socialization, externalization, combination, and internalization. This SECI model supports the idea that knowledge is formed as a result of the process of knowing and knowing is informed by knowledge thus the interaction between tacit and explicit is a circular process. This circular process examines the interchange between tacit and explicit knowledge with *ba* as a contextual overlay. This concept is at the heart of this study, particularly as tacit and explicit knowledge interact through the SECI process in the form of students engaging with the artefacts, retrieving relevant information, and subsequently, leaving artefacts behind. The foundation of knowledge creation as defined within this OKCT is that by continually having the means to interact with tacit and explicit knowledge appearing in the form of learning artefacts, (the SECI process with *ba* acting as a context), we offer learners a richer opportunity to engage and develop new knowledge.

In a design-based research study, a literature review is a continual process of refinement (Herrington et al., 2007), resulting in areas of focus surfacing both during the study and afterwards. Additional literature domains came to light, in part as a result of the use of the Elgg environment, as well as during the data analysis stage of the study. The original study plan did not include a socially networked learning environment; however, the affordances offered by socially networked learning spaces, such as the Elgg environment, are factors in changing the way we view learning environments (Anderson, 2008). As a result, the Elgg environment became the most suitable place for this study.

Lamberson and Lamb (2003) state that "the amount of intellectual capital that is resident in CMS [LMS] sites worldwide is staggering" (p. 59). They suggest that there is "no technical need" (p. 72) for this data to be exported, although 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). This disconnect between the walled world of the LMS and the permeable, user-controlled world of an environment such as Elgg, is something that speaks to the need for greater and more far-reaching studies of the value of these environments within higher education. Anderson (2008) adds to this conversation outlining a need for "the freedom to control one's learning experience" (p. 224). Anderson integrates aspects of Paulsen's (1993) theory of cooperative freedom and develops a definition of 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 finding in this study is that through the use of a socially networked online learning environment, students retained control of their artefacts and became aware of the impact and value of the artefacts of others through their daily online interactions. The literature does not negate the value of an LMS (Adams, 2010; Siemens, 2004), though it clearly shows its

limitations. Students acknowledge the differences between these two forms of learning spaces and, with certain environmental reservations, students appear to understand the personal control and power presented by an online socially networked learning environment.

During the coding phase of the data, the value of personal efficacy became clear in the various comments made by students. Patterson and Kelleher (2005) describe efficacy as a concept of "beliefs about your capability to accomplish challenging goals" (p. 76). Efficacy, as described above surfaced both through the use of the socially networked online learning environment, as well as through the use and reuse of the archive. Part of the reflective questions asked of students in the course queried their net efficacy. As these issues were being viewed through the coder's lens, it became clear that efficacy surfaced through the breadth of most of the conversations and interactions. Social cognitive theory suggests that self-efficacy influences participation and engagement (Bandura, 1977a, 1977b, 2001; Schunk & Usher, 2012; Zhuo, 2011). Although personal levels of confidence were not directly studied, levels of engagement and participation increase as students become familiar with their environment as well as when they use and access of the archive in addition to their day-to-day involvement within the socially networked learning space.

Reflective practice was one area of this study that stood out both in a direct and obvious way as well as indirectly. In order for students to see value and use of the artefacts within the archive in this study they need to be able to discern the value of what was present in their learning environment. Schön (1983, 1987) speaks of reflection in action (while doing) and reflection on action (afterwards). Schön understood this to be a continuous learning practice and as students in this study spent time engaging the archive by reading and sharing articles, a form of reflective practice became evident. Through his examination of Schön's models, Boud (2001) states, "writing is a means of puzzling through what is happening in our work and our personal lives" (p. 11). Artefacts within the course archive offer similar opportunities to puzzle through what is happening in the learning process. As students became more comfortable with their environment, the puzzling process appears to add to the learning and knowledge creation.

Methods and Procedures

The study is a qualitative examination of the potential value for students of an archive containing the day-to-day activities and discussions from students in previous iterations of their course. One of the challenges presented by this research is that DBR is inherently a pragmatic model while much of this current study had an overarching constructivist/interpretivist approach. This approach is evident in that the key goal of the study is to determine the use and value of an archive in an online course through the voices of the students in the course. Design-based studies are meant to use direct interventions as a vehicle to develop solutions to education problems, and in the process produce design principles as guiding products for future work by industry practitioners.

> 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)

In addition to the intervention being placed in a live environment, there is an inherent understanding about DBR such that "distinctions among designers, researchers, and participants are blurred" (Wang & Hannafin, 2005, p. 9). The "researcher attempts to experience, shape, and engage fully as both a participant and a researcher" (Berry, 2014, p. 118). This participant-researcher role is recognized and supported by the work of Guba and Lincoln (1986) and by being as much a participant as a researcher, the researcher has both a challenge and an opportunity to experience, analyze, and report from a richer place in the research process.

DBR is an iterative model and demands a circling back and revisiting of the model and initial outcomes, which can result in changes to the environment before again moving forward to a succeeding iteration. This process can take considerable time; however, Herrington, et al., (2007) propose a DBR model for doctoral studies considering the shortened time frames demanded of most doctoral programs. This study was part of a doctoral dissertation in which a two-iteration model was constructed to account for this truncated time frame. Anderson (2005) examines the effect of iterations and suggests "we are more knowledgeable than at the entry point for the previous stage. Thus knowledge grows in a circular fashion as [the study] iterates through phases" (p. 7). This statement mirrors aspects of Nonaka and Takeuchi's (1995) knowledge creation cycle, the SECI model, in that with each subsequent cycle or iteration, new knowledge is created and the process of knowing evolves. The cycles become an outward spiral growing larger with each circular iteration.

The study takes place within two consecutive iterations of an online Masters course housed within a custom instance of an open-source, socially networked online learning environment (Elgg). The key aspects of this learning space are that its inhabitants own the space, it has controllable privacy, and each participant has a verifiable identity (About the Landing, n.d.). These features are important safety and security elements for a social networked learning space.

The first iteration of the study offered a rough archive of student discussions from two prior sections of the course. The rough aspect of this archive and the housed artefacts offered limited access to what was in the archive and the Elgg tool did not (at that time) have sophisticated search features to assist in locating items deemed to be relevant. There were challenges in locating artefacts of value; however, the participant-researcher created annotated links to some of the artefacts and acted as a guide in the early stages of the course and the archive use. The major assignment was changed to have students gain access to and use the archive. There was also a final reflection that asked questions about the perceived use and value of the archive. Students were encouraged to think about the impact of their involvement with the archive knowing that immediately following it, there would another section of the course using an ever-growing archive.

Students in the second study iteration were offered a somewhat different environment than the first. The Elgg software had been updated and a variety of features, including the search feature, were improved. The most significant difference between the two iterations of the study

however is that the archive was different. The first study group grew to understand the implications of their contributions and added artefacts with an appreciation of their value to their learning including more meaningful search tags. In many ways, students in the second iteration received a course environment containing a living archive where the contents spoke more directly to them as a result of the previous group's awareness of the study. These environmental changes are part of the iterative nature of a design-based study. Neither the researcher nor the course instructor made any specific changes to the course design.

Students in both iterations are made aware of the control they had over every contribution they made, particularly with respect to their privacy settings. They were shown that besides their day-to-day privacy settings, they owned their contributions in such a way that at the end of the course they could remove every trace of these contributions. At the conclusion of the study it was discovered that one student did remove all their content.

At the start of each of the two course iterations students are introduced to the researcher and are sent a consent form to participate in the research. Students are informed that without a signed consent, none of their contributions would be used in any way in this study and if a conversation contained text from both a consent-giving student and a non-consent student, the entire conversation would be excluded from the study.

At the completion of the course all discussions, conversations, and other added items are examined against the consent documents and multiple text files are created containing data from the consent-giving students. The "data set consisted of all of the personal blog postings, class discussions…, including end-of-course reflections… along with any blog postings and comments that were added as a result of subsequent responses to their reflections" (Berry, 2014, p. 149).

At this point the researcher, as sole-coder, began the process of coding the data using Saldaña's (2013) approach to qualitative coding. Both descriptive and sub-codes are used in this process and the entire data set is re-examined three times in an attempt to refine and reduce the number of codes. The initial descriptive codes are truncated forms of the three core questions in this study: use; value; and, challenges. As the coding proceeds, two additional descriptive codes are added: custom Elgg and tacit. The subcodes come from an interpretation of what is being said in the data. This interpretation is an attempt to best describe what was happening in the text, either on its own or within the context of the surrounding text. This sub-coding process is refined and in the re-examination process mentioned above, a total of 70 initial codes are reduced to 39, which forms the basis for the results of the study. Saldaña (2013) supports the work of the sole-coder in that he outlines a three-part strategy to ensure "the trustworthiness" of the process (p.36). The resulting 39 codes may be considered too large a number. The volume of the data and the nature of some of the less frequent codes are examined and based upon this examination it is believed all of the 39 codes need to be recognized and explained as part of the study. The coding was done using Mac-based software called HyperRESEARCH and the researcher coded all of the data manually from within this software.

Results

The study participation rate, as shown in the Table 1, is approximately 50%, however upon completing the coding process it became evident that some students had much to say while others said very little. Even within the little that was contributed, less still was of value to this

study. In the end, approximately 20% of participants in the study provided most of the commentary and contributions.

The data analysis helped to bring out a number of unintended items as alluded to earlier in this paper. As the codes were examined, recoded and linked, efficacy surfaced as a consequence of the use of the archive. Students saw in the archive, through the work of others, challenges and concerns similar to their own. Various comments made by students suggest that by seeing the challenges of others and getting to know that previous students had these similar issues and concerns, the level of tension and trepidation appears to have lessened. Additionally, personal efficacy also appeared to have come about as a result of the use of the socially networked learning space in that as users in this environment begin to understand how to use and benefit from its openness, the user's sense of ownership appears to encourage and support their confidence.

The *Use* code and related sub-codes shows how students find value in using artefacts and how their use benefits their understanding of the course material and subsequent learning and knowledge creation. The *Use-sharing* sub-code, for example, shows how students found ways to discover connections to their learning and, in turn, offers further connections to their current class colleagues. They also added comments to the work in the archive believing that future students would read and see similar connections. Sharing was not just reserved to current students talking to current students. A number of the conversations appeared to be directed at individuals who might find their work in the future and by sharing in this way, current students found creative ways to access and use the artefacts.

The *Value* code and its related sub-codes provided clear evidence of reflective practice and support for the process of learning and knowledge creation. Students repeatedly spoke of the value of the archive in terms of their learning and they used language to suggest that the archive was a living entity from which they benefited. Additionally, it was not just a living entity that they benefited from rather it was something they related to and were a part of. There was ownership of their contributions and with this ownership there was evidence of care and forethought in their contributions for future students.

The *Challenges* code was never meant to be a negative statement about what was happening within the learning environment and the archive, however the choice of such a word for a sub-code may have coloured its true value. As the results were analysed, it became evident that the majority of the challenge issues centred on how the archive changed "student views on the process of learning and how these views begins to change their personal efficacy" (Berry, 2014, p. 205). Challenges offered students an opportunity to learn and to better understand the intent of the archive and their role in it. Many of the comments show a change in the way students saw themselves and their relationship to their learning environment, particularly in relation to the socially networked learning space.

The *Custom Elgg* code encompassed a broad range of issues and concerns ranging from student willingness to experiment with an unfamiliar learning environment to the openness and permeability aspects of an environment such as Elgg. The study, as outlined, would not have taken place without the use of this socially networked learning environment and despite interface challenges and concerns over privacy, the key elements of this environment as noted above

(inhabitants own the space, controllable privacy, and verifiable identity) make this an eminently useable tool for teaching and learning.

The last code, *Tacit*, is in many ways an anomaly, yet is one that needs to be recognized within the core of this study. There were challenges from many areas with respect to the value of including tacit as an element in this study. Tacit was consciously left as a visible part of the study not because it is believed that tacit knowledge is something that is visible rather evidence of tacit knowledge can be found in the form of truncated thoughts and other language uses or structures found in discussion forums. "Students understand the nature of "Aha" moments, and they know how to work with student peers past, present, and future in support of this process" (Berry, 2014, p. 236). Finding evidence of tacit knowledge is a subtle process yet this study produced sufficient examples of student work to support the inclusion of tacit knowledge as an element in the use and value of an online archive.
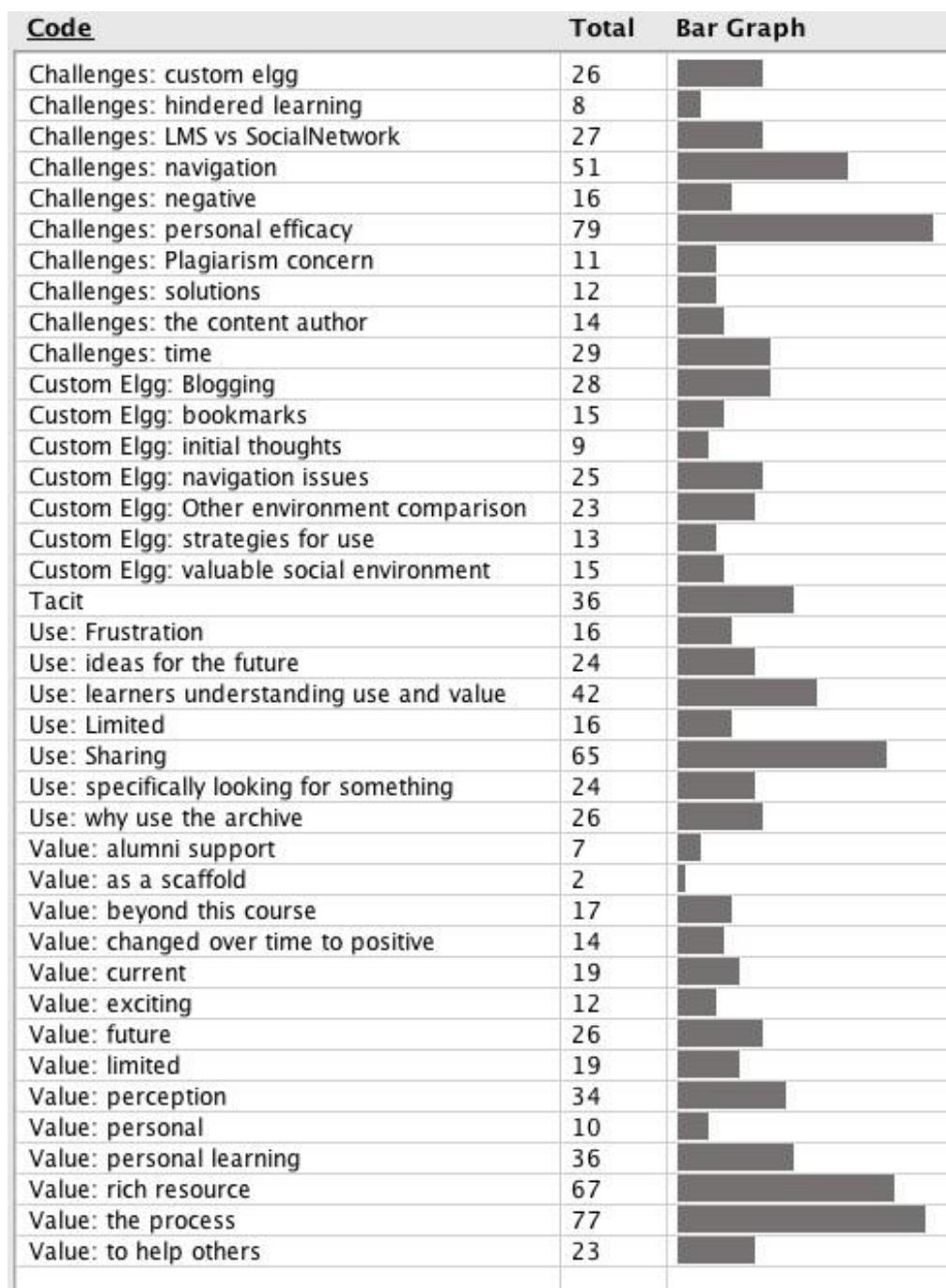
Code	Total	Bar Graph
Challenges: custom elgg	26	
Challenges: hindered learning	8	
Challenges: LMS vs SocialNetwork	27	
Challenges: navigation	51	
Challenges: negative	16	
Challenges: personal efficacy	79	
Challenges: Plagiarism concern	11	
Challenges: solutions	12	
Challenges: the content author	14	
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	

Figure 1. Final 39 codes.

Conclusion

This study attempts to mirror aspects of OKCT in an education context. These include "the process of knowledge creation, using the SECI model, and *ba* as the context within which knowledge is shared and built" (Berry, 2014, p. 243). Evidence of OKCT is threaded throughout the data and can be seen in terms of the use and value of an archive.

As outlined earlier in this paper, a design-based study seeks to create change and this is expressed in the form of design principles. This study produced two key outcomes or design principles. The first outcome is the use of a socially networked online learning environment for teaching and learning. This type of learning environment permits the use of persistent artefacts along with permeable and flexible boundaries allowing participants an opportunity to create shared spaces as needed to support learning. Learner engagement and efficacy becomes a foundational piece of such an environment

The second outcome is that students in this study support the use of an archive containing artefacts from prior iterations of a course. The study demonstrated that such an archive would be best placed within a socially networked learning space such as was used in this study with an understanding that the environment would offer appropriate search, store, and retrieval tools. The study shows that the inclusion of an archive supports both personal and shared learning.

The study also demonstrates that further research needs to be done to find ways to encourage academic institutions to move beyond the fixed world of the LMS and begin to share the learning processes beyond the confines of any single classroom. The idea of using and including aspects of OKCT in educational settings also needs to be studied further as there are similarities to parts of OKCT and to Garrison, Anderson, and Archer's (2000) community of inquiry model. Both acknowledge the concept of shared spaces and the value of presence. Finally, the inclusion and long-term use of a dynamic online archive as a vehicle in support of learning needs to be further studied as we continue to re-examine our understanding of teaching and learning in the 21st century.

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