

# ONLINE LEARNING COMMUNITIES IN THE NEW “U”

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## 1. ABSTRACT

*In an academic world largely dominated by instructor facilitated learning environments (i.e. lecture halls and course management software), our research implements and measures the impact of a student-owned and operated virtual learning environment. Adopting an Action Design research methodology we look to expand scholarship and build community within our graduate school setting. More specifically, our research explores the impact of a user-defined online learning community (OLC) on a group of 118 graduate students, across 6 doctoral courses. Our findings reflect positively on a number of constructs, including perceived learning, social interaction and community and have provided our university with a proof-of-concept OLC, offering a valid alternative to traditional course management systems (CMS).*

**Keywords:** online learning community; social networking; Web 3.0; virtual university, Elgg

## 2. INTRODUCTION

On the eve of the dot-com bubble, Peter Drucker (1997) stated, in an interview with Forbes magazine, that the modern university, with its residential campuses, would not survive because they are hopelessly unsuitable and totally unneeded. Drucker's comments have been echoed across higher education for ten years ushering in what has been subsequently coined the New "University" (or New "U"). Although a decade has passed since Drucker's assertion, traditional classroom-based learning continues to prevail. While this face-to-face model continues to thrive, there has been an explosion in technological innovation across all college campuses, from dormitory life, to classroom learning, ushering in various hybrid models for higher education.

As we enter into the age of the New "U", leaders of our own university, a graduate school in the U.S., believe that its continued success depends on the existence of a vibrant intellectual conversation among its stakeholders of students, faculty, staff, and alumni. This vision goes beyond simple face-to-face interactions and considers the virtual realm to help create new opportunities for building community.

Through Action Design research, we report on the construction and implementation of software designed to stimulate community while, at the same time, fostering learning. After 13 months of data collection our results reflect positively on a number of measurements, including perceived learning, social interaction and community building. Consequently, our research has provided our university with a persistent virtual space for collaboration, offering a student-driven alternative to the instructor-driven course management systems (CMS) model.

### **3. DEFINING AND ESTABLISHING COMMUNITY**

Etched on the perimeter wall of our university campus there is the phrase, “The center of a college is in great conversation and out of the talk of the college life springs everything else.” This notion of conversation extends beyond face-to-face interaction to include all aspects of life within higher education including course discussions, campus speakers, symposia and academic conferences. Participants in higher levels of higher education (i.e. graduate students) aspire to become participating members of their academic communities where they discover and share knowledge with their academic peers.

Academic communities can be classified as a one subset of what Lave and Wenger (1991) have coined communities of practice (CoP). In such communities, individuals work together towards common goals, collaborating on common problems, sharing best practices, supporting one another and sharing a common identity. Successful CoPs sustain engagement and collaboration among individuals whereby knowledge sharing becomes an intrinsic function of the CoP (Adams and Freeman, 2000).

CoPs are increasingly being used in the diffusion of knowledge by streamlining workflow and sustaining intellectual capital within and across organizational boundaries (Mason and Lefrere, 2003). In all types of knowledge sharing activities, knowledge contributors and seekers require a common community to engage in conversation, experimentation, and experiences with other people who have similar objectives (Pan and Leidner, 2003). In a CoP, knowledge sharing activities involve individuals using the CoP as a mechanism for *effectively* conveying what they know (Hendriks, 1999; Usoro and Sharratt, 2003).

In the construction of our university’s online CoP, a specific type of CoP, we follow eight principles identified by Daniel et al. (2003) in classifying traditional CoPs. Thus, membership in our community will include:

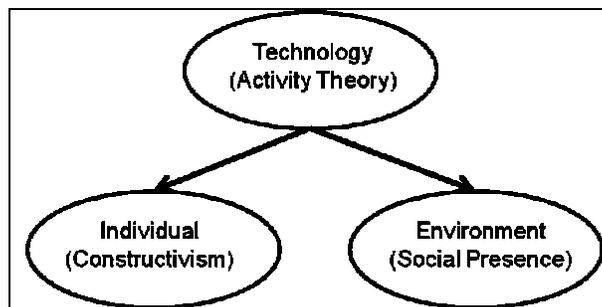
- Shared sets of interests
- Individual autonomy in setting the goals of the community
- A common identity
- Awareness of the social protocols and goals of the community
- The ability to share information and knowledge effectively
- Awareness that each is a member of the community

- Voluntary participation
- Effective means of communication.

#### 4. THEORETICAL CONSIDERATIONS FOR ONLINE COMMUNITIES IN THE NEW “U”

When incorporating the various elements (outlined above) into our online CoP we use Figure 1 as a theoretical model. In today’s classroom, activity based learning, represented in our model by Activity Theory, is common where students and faculty combine the use of technology to accomplish high level course tasks. These technologies, in turn, should also facilitate social interaction and building community, represented in our model by Social Presence Theory. Additionally, any technology must accommodate for the unique learning styles of each individual, represented in our model by constructivism.

Figure 1 –Model for online CoPs in the New “U”



#### Constructivism (focusing on the needs of the learner)

Prior research has traced the roots of a CoP to constructivism (Johnson, 2001; Palloff and Pratt, 1999; Savery and Duffy, 1996). Constructivism has largely been attributed to the work of Piaget (1952), who first theorized that learning can be based on the interaction and experiences of the learner within a specific context. Consequently, individuals develop knowledge and understanding through forming and continually refining concepts.

There has been much research extending Piaget’s work. Hagstrom and Wertsch (2004) state that constructivism encourages, utilizes, and rewards the unique and multidimensional characteristics of the individual throughout the learning process. Additionally, Squires (1999) states that constructivism focuses on learner control, with learners making decisions that match their own cognitive state and their own needs.

While constructivism began as a theory of learning, it has progressively been used as a theory of education, a theory of the origin of ideas, and a theory of both personal knowledge and scientific knowledge (Matthews, 2002). Dalsgaard (2006) argues that social software can be used to support a

constructivist approach to online learning. More specifically, social software can support self-governed, problem-based and collaborative activities. Thus, as we construct our university's online CoP we consider how elements of social software can be used to support the constructivist approach to learning and interaction.

### **Social Presence (focusing on the learner's environment)**

Understanding how each individual interacts with technology is important, but understanding the environment in which each learns is equally important. Within our online CoP, the environment will be comprised of a number of elements including other members of the CoP, the community as a whole and the various technologies that are used. Social Presence Theory asserts that individuals are influenced to a great extent by these surrounding elements. Furthermore Social Presence Theory looks at the degree to which an individual's perception of an online community, in its entirety, affects his or her participation in that community.

Within human-computer interaction, social presence theory considers how 'sense of community' is shaped and affected by technological interactions (Biocca et al., 2003). Tu and McIsaac (2002) redefine social presence for computer mediated communication stating that it is the degree of feeling, perception, and reaction to another intellectual entity within a computer mediated environment. Existing research indicates that high levels of social presence play a significant factor in improving instructional effectiveness and building a sense of online community (Gunawardena and Zittle, 1997). Stacey (2002) also found that a higher quality of electronic communication helps to engage students and aids in their learning of the course material.

When individuals perceive others within an online CoP to be *real*, they can begin building trust in the community and also start to view the online community as a valid source of knowledge building and/or social interaction. Thus, when implementing our university's online CoP, it is critical to consider the composition of community, including understanding that the community itself becomes a unique entity. Furthermore, an online community cannot thrive without a palpable sense of social presence; therefore, we focus our research on extending the existing social presence of the classroom and campus into an online experience.

### **Activity Theory (focusing on the learner's activities)**

Facilitating both the individual and the community will be the specific activities that take place within an online CoP. While social presence can account for the technological environment, it does not fully consider how individuals manipulate specific technologies to accomplish certain tasks and goals. In existing online

CoPs, activities include working with and manipulating Web 2.0 technologies to share knowledge and build social capital.

Activity Theory can be used as a lens for understanding these sociotechnical interactive networks as a function of technology, community and individual interaction between the two. Activity Theory states that activities are goal-directed, where there exists multiple ways to achieve those goals, oftentimes through adaptive means (Bødker, 1989). Furthermore, when able to choose educational activities from both online and face-to-face mediums, instructors can potentially select the activity that provides the best fit with any particular learning objective (2006).

In one study on higher education, Issroff and Scanlon (2001) found that Activity Theory dictates that multiple factors exist that can impact the usage of any one specific technology. Individuals will use different Web 2.0 technologies differently in order to accomplish specific tasks. Additionally, individuals can creatively adapt their activities in order to meet their required objectives.

## **5. BRINGING COMMUNITY ONLINE**

### **Online CoPs in the New “U”**

With the clear vision of providing our university with an online place for building community and fostering learning, we were faced with the task of identifying which platform to support our online CoP. One specific type of online CoP, used across 96% of learning institutions, is (CMS) software (Educational Marketer, 2003). CMS software is designed for the facilitation and management of academic course work. Our university's preferred CMS platform, Sakai, provided us with the opportunity to work with an already implemented and supported software platform for which to develop our online community. However, although Sakai could provide a powerful tool for instructors, we felt it would fall short in providing students with a student-centric environment.

As a largely top-down system, course facilitators control the flow and ownership of information in Sakai. Additionally, course communities in Sakai close at the end of a term leaving no persistent artifact students can take with them or return back to. Sakai also limits the amount of peer-to-peer conversation, a dialogue that can be essential in fostering knowledge and building community. As a result, we label CMS software, like Sakai, as an institutional tool that hinders students from controlling the visibility, organization and/or presentation of their online content.

Residing on the opposite end of the CoP 'control spectrum' are more user-centric online learning communities (OLC). Where CMS software is top-down, OLCs can be viewed as bottom-up, where individuals own the content they create. Furthermore, it is the individual or community that decides what work becomes visible to whom. In providing the user with this control, OLCs can be

characterized more closely with traditional CoPs, where the success of the OLC is directly correlated to the participation of its users. In an academic setting, although individuals may be graded on their contributions, the overall community (i.e. class) can also be assessed for its success or failure in creating a sustainable knowledge community. Table 1 illustrates this bifurcation in detail.

**Table 1 - CMS versus OLC**

<u>Bifurcation in online CoPs</u>	
<u>Course Management System</u>	<u>Online Learning Community*</u>
<ul style="list-style-type: none"> <li>• Top down (instructor-driven)</li> <li>• Teacher owns courses and structure</li> <li>• Students react to what is required</li> <li>• Content echoes instructor’s voice</li> <li>• Bounds knowledge to what is required by the course</li> </ul>	<ul style="list-style-type: none"> <li>• Bottom up (student-driven)</li> <li>• Students take ownership of content</li> <li>• Students create and respond to others</li> <li>• Students create a unique voice</li> <li>• Fosters search and gather techniques for knowledge</li> </ul>
<p><i>*Indicates our preferred CoP solution</i></p>	

### **User-centric OLCs**

Studies in online collaboration show that virtual communication patterns correspond in some fashion to real-life communication (Redfern and Naughton, 2002; Rhode et al., 2004). As in face-to-face communication, members of an OLC should be able to state what they think, comment on what others have said, collaborate on common statements, and share information in many forms. Inspired by exemplars of online community and conversation—including MySpace™, LinkedIn™, and Facebook™—we focused our efforts on the social networking model and many Web 2.0 technologies incorporate.

Web 2.0 technologies, such as blogs and wikis along with peer-to-peer networking and file sharing, empower individuals to take ownership of their content while also making it easier to pursue social and/or scholastic ties with their peers. And increasingly, more individuals are gaining access and familiarizing themselves with these technologies, thus making their introduction into the classroom more-or-less seamless. Research trends support these assumptions. Brescia and Miller (2006) found benefits to using blogging in the classroom including enhanced student reflection, increased student engagement, portfolio building, and better synthesis across multiple activities. Rollett *et al.* (2007) discovered that wikis were well suited for team activities providing individuals with the ability to easily exchange, integrate and develop information through asynchronous means.

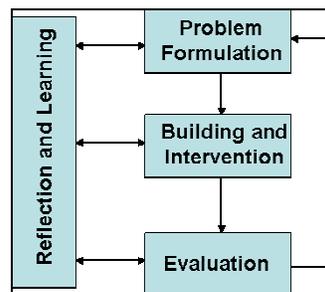
With such concepts becoming critical in advanced learning environments, so is the market for developing out-of-the-box solutions that look to incorporate all-in-one Web 2.0 components. Sprouting from popular online social environments, we believe an OLC offers greater chances to aide in learning and community building. OLCs also make it easy to allow non-student stakeholders to participate, unlike CMS software such as Sakai, which restrict access to only those students enrolled in a particular course.

## 6. RESEARCH METHODOLOGY

### Action Design

Our research incorporates aspects of both Design Research (DR) and Action Research (AR) as proper means for building a sustainable OLC at our university. Action Design provides a model for cross-fertilizing DR and AR (Cole et al., 2005). As illustrated by Figure 2, Action Design offers a measure of overlap when intervening in an organizational setting rather than designing and implementing an artifact before or after the fact.

Figure 2 - Action Design Cycle



Action Design involves on an iterative cycle of development divided into a number of phases. In this research we focus on Phase I and Phase II of the Action Design process. During these phases we worked with key stakeholders to define and implement a proof-of-concept OLC for building a persistent virtual space at our university. More specifically we ask the following research questions:

1. What value do individuals perceive from stakeholder-defined OLCs?
2. What components of an OLC best support learning and community-building?
3. Should our university continue to invest in the development of an OLC? And if so, what are the next steps?

## 7. BUILDING AND INTERVENTION

In Design Research (DR) the designer is concerned with the way things ought to be in order to attain goals and to achieve these goals the designer devises artifacts (Simon, 1996). DR aspects in this research involve the implementation of an OLC at our university.

In developing an online social environment, Preece (2001) emphasizes the criticality for developers to construct or select software with good usability and good sociability. Preece also describes that while developers can control the design of social software, they cannot control social interaction across the software. Prior to selecting our OLC platform, we evaluated a variety of proprietary and open source social software systems. We compared these

technologies based on cost, usability, extensibility, customizability and the range of features each offered. In the end, we were left with two plausible solutions, 1) extending our existing CMS software, Sakai, to be more like user-centric OLCs or 2) implement an available open source tool OLC, Elgg. For its range of social features and control it offers users, we chose Elgg. Elgg was also preferred, since it provided the researchers with greater freedom to implement and test out additional features, such as group writing and advanced messaging.

## Elgg Learning Landscape

Available through SourceForge.com, Elgg comes bundled with capabilities for blogging, file sharing, creating unlimited sub-communities and peer-to-peer networking. Additionally, Elgg provides abilities to restrict data access across a number of levels, including at the individual-level, community-level, logged in user-level and various custom levels. Furthermore, the software is designed for users to have their own suite of Web 2.0 tools, distinct from those of the community. Figure 3 provides a snapshot of a specific community profile in Elgg.

Figure 3 – Elgg Community

The screenshot shows the Elgg community profile for 'SL Squared'. At the top, there is a navigation bar with links: 'Your Activity', 'Your Blog', 'Your Files', 'Your Pages', 'Your Network', 'Your Messages (1)', 'Your Resources', and 'Your Profile'. On the right side of the navigation bar are links for 'Account settings' and 'Log off'. Below the navigation bar is a search bar with the text 'Search', a dropdown menu set to '- all -', and a 'Go' button. There are also links for 'Browse' and 'Tag cloud'. The main content area is titled 'Claremont Conversation Online' and 'CGU's Online Learning Community'. The profile owner is 'SL Squared', with a profile picture showing a blue square with 'sl.²' and the text 'SL Squared'. Below the profile picture are links for 'Tags' and 'Resources'. The profile description includes 'Research Community for SL Squared Lab'. There are sections for 'Brief description', 'Extended profile', and 'Introduction'. The 'Introduction' section states: 'The mission of SL2 is to study how computer software can be used to advance social learning through social interaction. We use a design research approach to build software. Our laboratory is currently working on a number of projects including an intelligent online discussion system (IODS) and a design to facilitate virtual conversation and collaboration across the university.' There are also sections for 'Directors:' and 'Current Researchers:'.

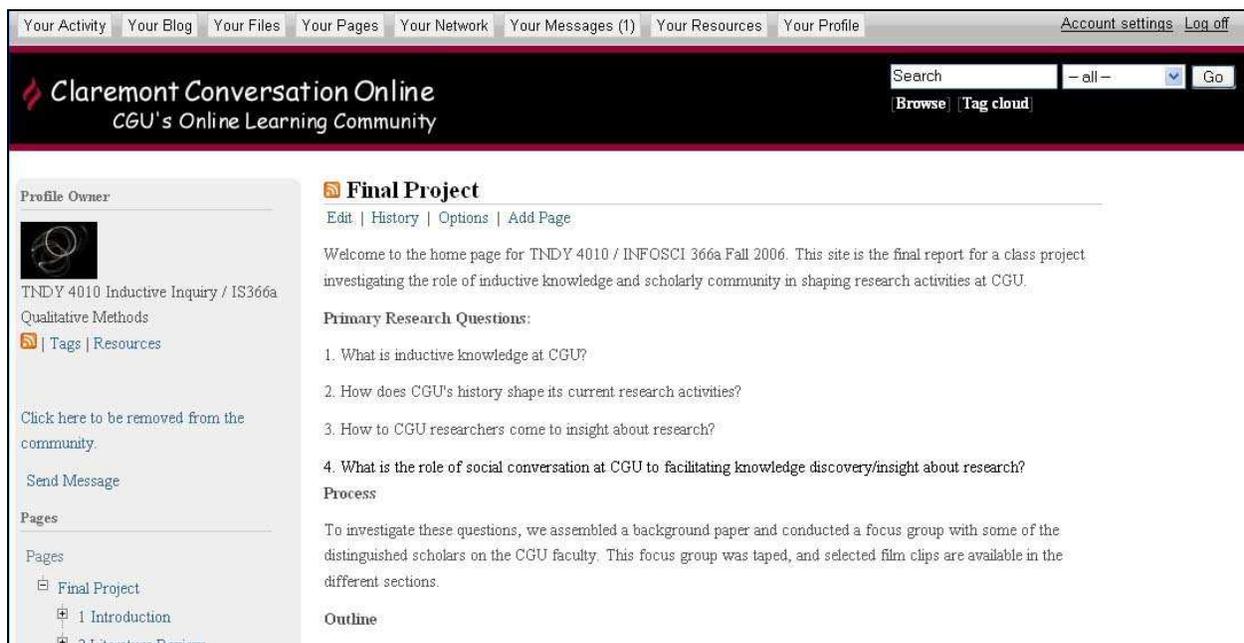
## Elgg Wiki Add-in

Although Elgg provides a suite of Web 2.0 utilities, out of the box it lacked a complete set of tools we deemed necessary for graduate-level learning. As an open-source tool, we customized the Elgg software across a number of dimensions.

One integral component added was a group writing tool, or wiki. Unlike traditional wikis, we designed the wiki to use namespaces local to each user or

community so that multiple users can have pages of the same name. The add-in also uses a WYSIWYG (what you see is what you get) text editor, as traditional wiki markup languages can be intimidating for non-technical users. The tool provides one-click functionality to add, edit and delete pages with a visible tree-style menu on the left. Figure 4 provides a screenshot of a final course project composed entirely through the wiki.

Figure 4 – Elgg Wiki



## 8. IMPLEMENTATION

After six months of development and working with key project stakeholders, an enhanced version of the Elgg platform, complete with a wiki and messaging, was released to a pilot set of users.

### User Population

For the initial phases of our research we focused on the impact of our software on a specific population at our university, doctoral students taking transdisciplinary courses (t-courses). Although our software was incorporated into a larger population, we focused our measurements on this population of 116 members across six t-courses due to the unique make-up of the courses themselves. T-courses aim to provide doctoral students with a practical experience working with colleagues in different fields and provide an opportunity for doctoral students and graduate faculty to work collaboratively and across traditional disciplines towards a common set of questions and issues, while drawing on their own individual disciplinary training.

Aside from their unique composition of multidisciplinary students and faculty, we focused on the t-courses because, in the past, they have relied on traditional means of instructor-facilitated lecture or face-to-face discussion with little to no virtual collaboration. Classroom objectives were usually met through traditional forms of in-class participation and in-class assignments and project presentation.

### T-courses as CoPs

As a more advanced type of CoP, an OLC is geared towards virtual collaboration and learning. If our population cannot, at its basic level, be identified as a CoP, developing an OLC would inherently fail. For this, we return to Daniel et al.'s guidelines for CoPs. Table 2 maps aspects of a CoP along with goals of t-courses at our university. In only one area, voluntary participation, do t-courses fail to meet the requirements of traditional CoPs.

**Table 2 - T-courses as CoPs**

<b>Requirement</b>	<b>Y/N</b>	<b>Comments</b>
Shared interests	Y	<ul style="list-style-type: none"> <li>• Passing the course</li> <li>• Gaining knowledge and/or research experience</li> </ul>
Autonomy in setting goals	Y	<ul style="list-style-type: none"> <li>• Individuals have the autonomy in expanding or limiting their participation on a number of levels</li> </ul>
Common identity	Y	<ul style="list-style-type: none"> <li>• All are members of our university</li> <li>• All are doctoral students</li> </ul>
Awareness of social protocols and goals	Y	<ul style="list-style-type: none"> <li>• 2<sup>nd</sup> year doctoral students becoming active participants in the academic community and also becoming more established in their research</li> </ul>
Shared information and knowledge	Y	<ul style="list-style-type: none"> <li>• With the addition of an OLC, yes, individuals have the ability to use the OLC to discover and share information</li> </ul>
Awareness of membership	Y	<ul style="list-style-type: none"> <li>• Students register themselves for courses</li> <li>• Course syllabi make learning objectives explicit</li> </ul>
<b>Voluntary participation</b>	<b>N</b>	<ul style="list-style-type: none"> <li>• <b>Although students can choose among a selection of t-courses, all doctoral students are required to take one t-course during the second year of their program</b></li> </ul>
Effective means of communication	Y	<ul style="list-style-type: none"> <li>• Traditional instructor/student based communication</li> <li>• OLC provides a number of communication methods</li> </ul>

### Instructor and Student Training

Prior to classroom implementation, we met with course instructors to facilitate how each would align course syllabi with the OLC. For example, if a course required weekly assignments based on selective course readings, or guest lectures, we recommended the community blog as a viable option for

individuals to express themselves. For more collaborative projects, we recommended that students collaborate through the wiki. However, we left it up to the instructor to decide how to best incorporate each of the technologies.

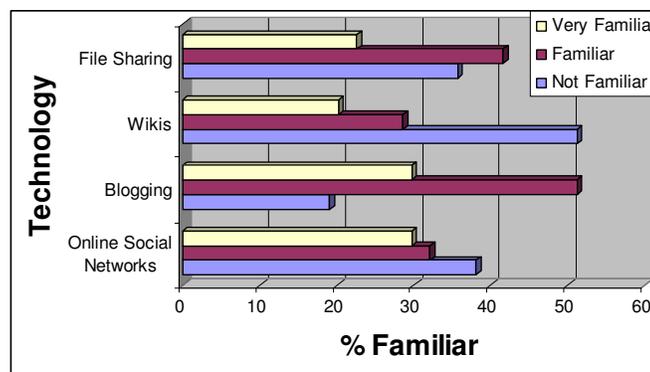
For user training we met twice with each class during the first month of the course. During the first meeting we focused our energy on providing general OLC orientation. Also during this time we handed out a "Getting Started" orientation assignment that provided step-by-step instructions for users to get logged on for the first time. The assignment also walked users through setting up a profile, uploading an avatar, publishing their first blog entry and joining their course community. We used the second meeting to field any major issues individuals had logging on and/or setting up their first blog and user profile. We also made ourselves available via email and, if needed, for subsequent group training sessions.

## 9. EVALUATION

### Pretest Analysis

We conducted a pretest, developed in-house, to gather general demographic information as well as to assess individual familiarity with Web 2.0 technologies incorporated into our OLC. The pretest was distributed in hardcopy form to the 116 t-course participants from a selection of fall 2006 and spring 2007 t-courses. The response rate was satisfactory, with 72% (84 responses) completing the survey. The pretest showed how familiar respondents were with Web 2.0 technologies such as blogs and wikis. Overall, respondents indicated a general familiarity with blogs (81%). However, over half of respondents were unfamiliar with wiki technology (51%). Additionally, many indicated unfamiliarity with online social networking (32%) and file sharing (42%). Figure 5 illustrates these distributions across technologies.

Figure 5 - Technology Familiarity (n=84)



### Site Usage

By monitoring and tracking system activity we discovered an abundance of rich data. This data offered us insight into how the software was integrating with courses and also how individuals were adopting the OLC.

We analyzed 390 days worth of Apache log files. Detailed in Table 3, the site averaged moderate usage with 44 daily users and over 4,600 daily page views. Although we focus our measurements on the outcomes of our t-course population, it should be noted that our software was also adopted by courses outside this population based on word of mouth and researcher affiliation. Consequently, at the time of this research, the tool was supporting 350 users across 65 communities. Table 4 provides a breakdown of site usage, with specific activities elaborated on in the following section.

**Table 3 – Apache Log Statistics**

<b>Website Page Views</b>	
Total Page Views	1,817,959
Page views per day (avg.)	4,649
Page Views per visitor (avg.)	103.51
<b>Website Visitors</b>	
Total Visitors	17,563
Visitors per day (avg.)	44

**Table 4 – OLC Site Usage**

<b>Category</b>	<b>T-courses</b>	<b>All</b>	<b>% T-course</b>
Users	118	350	34%
Communities	19	65	29%
Blogs	714	2104	34%
Blog Comments	552	1917	29%
Wiki Pages (All)	1729	3073	56%
Wiki Pages (Unique)	212	670	32%
Wiki Comments	34	51	67%
File Uploads	219	663	33%

### **Specific OLC Activities**

Activity Theory considers the various tasks users perform to help accomplish a goal. Activity Theory also identifies that the task, or action, is the basic unit for learning. In this section we explore how each t-course used the OLC to meet their learning needs.

#### *Blogs (and blog comments)*

We discovered that blogging was the most widely used technology with 714 blog entries created, stimulating over 500 blog comments. One possible reason for the successful adoption of blogs was our population's familiarity with this feature (over 80%).

Outside of general familiarity, there are additional reasons for the widespread adoption of blogging. Due to their journalistic styling, blogs are one possible way for students to transmit individual course assignments. The reverse is also true where blogs become a means for instructors to communicate information back to the students. Instructor feedback and empirical evidence shows that each course utilized the community blog as a portal for course discussion on guest lecturers, reading assignments and/or overall course discussions.

While blogging was common in each of the courses, blogging frequencies varied across t-courses. Some courses relied predominantly on blogs and blog comments to be the primary method for assignments, while other t-courses used a combination of blogging and wiki documents. Figure 6 provides a screenshot of the Elgg's blogging interface.

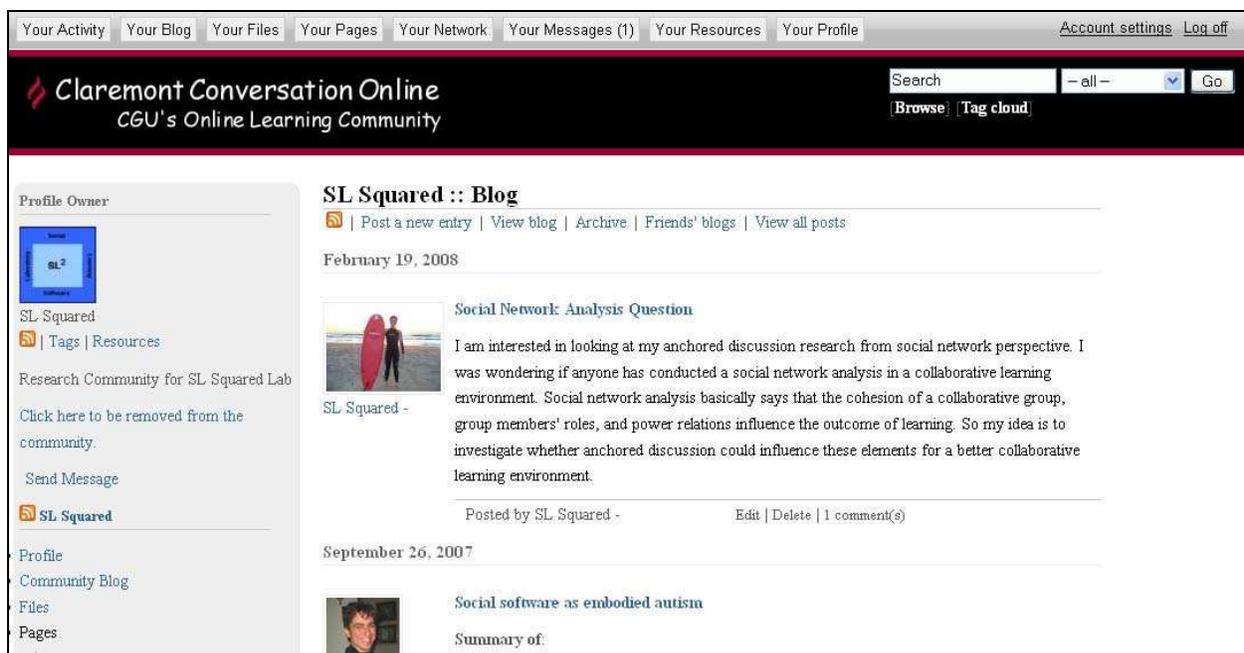
Throughout our research we requested qualitative feedback, in the form of open-ended questions, both written and verbal. In our final posttest, we specifically asked what aspects of the tool were most beneficial. Many respondents used this question to respond candidly about blogging in their respective course. One user stated,

"I can express myself through blogs; as a result I can share my opinion and understand myself more. I also review what I learn from class through blog."

And another stated,

"(The community blog) enabled our group to work away from campus, which was good for basic group communication."

**Figure 6 - Elgg Blogging**



### *Wiki (and wiki comments)*

For over half of our users, wiki technology was a new concept (51% unfamiliarity). However, the wiki add-in turned out to be a major addition to four of the six t-courses with another using it sparingly. The wiki provided a space to synthesize and collaborate on group projects. Additionally, the wiki allowed final projects to come alive through vibrant web pages with hyperlinks, images and YouTube™ videos. Some of these courses have allowed their creations to be

openly displayed on the web, providing a persistent artifact for anyone and everyone to view.

We also received substantial qualitative feedback on the wiki as well. One user candidly remarked,

“Wiki pages made it easy and non-threatening to collaborate with classmates on group projects. Also, it's easy to log on and see all changes to a document instead of reading lots of different drafts.”

Another stated,

“Going forward we hope that more users will embrace the power of the wiki in building research. The wiki captures the history of a document as it transforms across a particular timeframe.”

As is common with any technology under development, there were some problems with the wiki that we look to address in the upcoming phases of our research. Problems largely came from formatting issues when copy/pasting from popular text editors such as Microsoft Word. One comment stated, “I did not understand why text that I brought over from Microsoft Word as one style became formatted differently.”

## **Post Test Results**

With successful amounts of traffic and a good understanding of how individuals were using the OLC we measured how effective the tool was for building community, fostering collaboration and supporting learning. Consisting of closed-ended questions we distributed surveys to the same group of 116 t-course participants two weeks prior to the conclusion of their course. The response rate was satisfactory with 80 usable responses, or 69% of our population.

## **Building Community**

An important objective of our OLC design was to facilitate in building online community. Community can be measured in terms of social capital, or the common social resource that facilitates information exchange, knowledge sharing, and knowledge construction through continuous interaction (Daniel et al., 2003). To measure social capital across our OLC we modified an existing instrument developed by Gunawardena and Zittle (1997) and expanded by Richardson and Swan (2003). Our questionnaire measured the degree of social presence within an OLC and consisted of ten questions capturing various elements of community.

Detailed in Table 5, we were satisfied to discover high levels of social presence existing within our OLC. Respondents agreed that the Elgg platform was an excellent medium for social interaction (85%). Additionally, most respondents felt comfortable conversing through the OLC (86%). Overall, respondents felt

comfortable participating in course discussions (91%) and the majority of respondents perceived a strong sense of community for their course (74%).

**Table 5 – Social Capital (n=80).**

1=Strongly Agree, 2=Agree, 3=Agree Somewhat, 4=Disagree Somewhat, 5=Disagree, 6=Strongly Disagree, NA= Not Answered							
Survey Item	1	2	3	4	5	6	NA
The OLC was an excellent medium for social interaction	10%	34%	41%	6%	8%	1%	-
I felt comfortable conversing through this medium	16%	44%	26%	10%	3%	1%	-
I felt comfortable introducing myself in this course	19%	40%	33%	6%	1%	-	1%
The OLC helped me feel like part of the community	9%	25%	48%	9%	8%	1%	1%
I was comfortable participating in course discussions	25%	45%	21%	4%	5%	-	-
I was comfortable interacting with others in the course	29%	39%	25%	5%	3%	-	-
My point of view was acknowledged by others	21%	36%	25%	10%	5%	1%	1%
I was able to form different impressions of course participants	19%	39%	30%	8%	3%	-	3%
A strong sense of community existed in this course	20%	28%	26%	13%	10%	3%	1%
The course community improved my learning	16%	36%	29%	8%	6%	5%	-

### Course Facilitation

A second component of an OLC, and critical for one being used as an alternative to CMS software, is its ability to align with course learning objectives. For this, we constructed an in-house questionnaire measuring how well the OLC facilitated course objectives and whether or not it fostered more course-related interaction and motivation.

Consisting of 8 questions and detailed in Table 6, individuals responded that the OLC was easy to use (66%) and aligned with course objectives (60%). Only a small percentage found it to be difficult to use (10%) and/or miss-aligned with course objectives (16%). Results also indicate that individuals perceived more interaction with their professor (41%) and classmates (57%) than they have had in previous courses.

As motivational factors, the majority of individuals responded that making their work accessible increased their motivation to perform quality work (74%). Additionally, over half of our respondents felt that seeing their peers' work helped with their own work (54%). However, fewer respondents were motivated by potential viewers outside their course community (46%).

**Table 6 – Course Facilitation (n=80).**

1=Strongly Agree, 2= Agree, 3=Neutral, 4=Disagree, 5= Strongly Disagree, NA= Not Answered
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Survey Item	1	2	3	4	5	NA
The OLC was easy to use	20%	46%	24%	9%	1%	-
The OLC was aligned with the course learning goals	20%	40%	25%	13%	3%	-
The OLC helped me reflect on my class progress	11%	40%	28%	16%	5%	-
Provided more interaction with my professor	10%	31%	23%	18%	19%	-
Provided more interaction with my classmates	18%	39%	26%	14%	4%	-
Having my work accessible to classmates increased my motivation to do a good job	26%	48%	16%	8%	3%	-
Having my work accessible to people outside my class increased my motivation to do a good job	16%	30%	33%	15%	6%	-
My classmate's work helped me improve my own writing	14%	40%	26%	15%	5%	-

## Ownership and Control

A distinguished feature of Elgg and an area rated highly by respondents was ownership over site content. Detailed in Table 7, respondents agreed that a sense of ownership existed over their content (78%) with no responses indicating a lack of ownership (0%). Respondents agreed that this control over their content was important (75%) and that the ability to restrict such content was also important (71%).

**Table 7 - Ownership and Control (n=80).**

1=Strongly Agree, 2= Agree, 3=Neutral, 4=Disagree, 5= Strongly Disagree, NA= Not Answered						
Survey Item	1	2	3	4	5	NA
I felt a sense of ownership over my posted content	20%	58%	18%	5%	0%	-
A sense of ownership over my content is important	29%	46%	24%	0%	0%	1%
Ability to restrict my content was important	35%	36%	15%	11%	3%	-
The ability to customize my profile is important	18%	46%	24%	11%	1%	-

## Continued Usage

Our last set of survey items asked individuals about the overall success of the software. Ultimately, individuals were positive about the OLC with the majority agreeing that our university should have one (67%). Furthermore, respondents indicated that the site should be hosted by the university (79%) under an EDU domain extension (73%). However, and disappointedly, respondents indicated low levels of interest in creating online portfolios (35%) and even lower interests in maintaining peer relations through the software (33%). Table 8 provides a complete breakdown across these items.

**Table 8 – University Specific Questions (n=80).**

1=Strongly Agree, 2= Agree, 3=Neutral, 4=Disagree, 5= Strongly Disagree, NA= Not Answered						
Survey Item	1	2	3	4	5	N/A
Our university should have social learning site	24%	43%	28%	5%	1%	-
It is important to have CGU's online courses/communities on an academic site (rather than on commercial one)	41%	38%	18%	3%	1%	-
OLC address should end with ".edu"	30%	43%	20%	5%	3%	-

I am interested in creating an online portfolio	14%	21%	36%	23%	5%	1%
I plan to continue contact with peers through the OLC	9%	24%	35%	23%	10%	-

## 10. LIMITATIONS

We understand that some limitations in our research exist. The first concerns our focus of one specific population at our university, individuals taking t-courses. While the t-course provides a representative sample of doctoral students at our university, implicit data clearly showed a wide variation of usage across these six t-courses with no one class using it in the same manner as another. Although the diverse adoption can be viewed as a positive aspect showing the range of uses and adaptability of the software to different teaching pedagogy, it may also have impacted, positively or negatively, on how individuals perceived the OLC.

Additionally, while a range of t-courses were available for students to choose from, the t-course is a required course for doctoral course credit, going against the traditional notion of a CoP as purely voluntary. As our tool establishes a critical mass of users, necessary for a self-sustaining OLC, we hope to measure the impact our tool has on more voluntary ad-hoc communities, such as research specific communities.

## 11. NEXT STEPS

A number of next steps are ongoing. A primary objective of our Action Design is to create a sustainable OLC across our university, which involves multiple iterations improving our software's design and implementing it across disciplines. As a critical first step, we are working with our university's IT organization to embed the software into our university's IT infrastructure. This will allow our software to easily scale to larger populations and also provide better site monitoring. Additionally, it will allow our research lab to focus its efforts on measuring the tool's impact and building better software to meet needs of our university.

Additionally, a number of research projects are ongoing. Many of our respondents were neutral in areas such as continued usage (27%) and perceived learning (26%), providing a tremendous potential for developing innovative software designed to keep users returning to the OLC after a course concludes. Of these projects, one looks to use collaborative filtering to enhance blogging interaction and provide users with recommendations on making new connections. A second project will reassess the adoption of social portfolios for tracking student progress across graduate programs. Software for both is scheduled for release in fall 2008.

## 12. CONCLUSION

In higher education, instructor controlled learning environments, such as Sakai, Blackboard and Angel, are often the norm. As our university continues its transition into the New "U," university stakeholders believe in the power of a more networked community facilitated by social software.

After 13 months of site usage, our project team has successfully implemented and measured the impact of a user-centric OLC on our university's academic community. Following an Action Design research methodology, students and faculty have reacted positively on a number of constructs, including perceived learning and community building. Consequently, our results have helped provide a proof-of-concept for user-centric OLCs in higher education and provide a valid alternative to instructor-oriented CMS software.

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