

IRR  
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THE INTERNATIONAL  
REVIEW OF RESEARCH IN  
OPEN AND DISTANCE LEARNING

Vol 13  
No 4

## Editorial - Volume 13, Issue Number 4



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Editor, IRRODL

IRRODL continues to grow and succeed, and we wish to thank those whose time, energy, and expertise have contributed to this success through reviewing one or more articles in the past year.

As usual, this issue of IRRODL features articles from around the world, bringing you current results of research in theory and practice related to a growing number of models, designs, and research methods that are evolving as formal education embraces openness. It is exciting times for educational researchers, but more importantly this issue contains ideas that can be used to enrich open learning and teaching everywhere.

In the following section, I provide a very brief overview of the articles you will find in this issue.

Online constructivist pedagogies are often focused on learning achieved through group projects done collaboratively. The results can be encouraging, but the challenges and levels of adoption and participation vary greatly. A Canadian study, “An Investigation of Collaboration Processes in an Online Course: How do Small Groups Develop over Time?,” applies group development models to formal education groups online and suggests a theoretical model to help explain, understand, and guide teacher and student behavior when engaged in collaborative activities.

We are all trying to figure out business models for open content development and delivery, especially given the recent flurry of interest in MOOC models of free programming. In an international article the authors assess the “Impact of OpenCourseWare Publication on Higher Education Participation and Student Recruitment,” as demonstrated by early adopting institutions, including MIT, John Hopkins, and Open Universiteit Nederland.

The Net has allowed us to develop hundreds of different ways to communicate, share, and learn. Currently the institutional LMS remains the “workhorse” of formal education delivery and support, but increasingly teachers and students are exploring public networks like Facebook and LinkedIn and private network systems such as Elgg. However all these systems feature redundant affordances and powerful lock-in motivations that propel educators to use tools that they and their students are familiar with. In “Facebook Groups as LMS: A Case Study,” Israeli authors look at the advantages and challenges of using the world’s most popular social networking system for formal education.

In “Footprints of Emergence” a team of UK authors tackles the thorny issue of emergence when interaction, content, and even learning outcomes may emerge within (or outside) a formal learning program. The authors comment that “It is ironic that the management of education has become more closed while learning has become more open” and then demonstrate ways to visualize, understand, and embrace various types of emergent learning.

We all know that the ‘build it and they shall come’ model of online learning has severe limitations. In the study “Understanding E-Learning Adoption in Brazil: Major Determinants and Gender Effects,” the authors examine the adoption of e-learning programming using the popular technology acceptance model (TAM).

Low retention has always plagued almost all models of open and distance education. In “Who am I and What Keeps Me Going? Profiling the Distance Learning Student in Higher Education,” a qualitative study from the UK, the author investigates motivators, inhibitors, and institutional interventions that students experience in online courses.

Context is everything and helps explain the varied reactions to and adoption of online learning models in business training and professional development. “Organizational Factors’ Effects on the Success of E-Learning Systems and Organizational Benefits: An Empirical Study in Taiwan” looks at the critical contextual role of organizational factors associated with successful adoption of e-learning.

I’ve always been fascinated by the ways in which formal learning designs can vary the mix among student–content, student–teacher, and student–student interaction. I even went so far as to postulate Anderson’s interaction equivalency theory. In an article by an American author, evidence is uncovered that indicates a significant relationship between time spent in learner–content interaction and high grades. “Exploring Learner to Content Interaction as a Success Factor in Online Courses” reinforces the idea that quality interaction is important for motivation and achievement of learning outcomes, but that the type of interaction can vary.

Open scholarship is once again featured in a critical review from the USA entitled “Assumptions and Challenges of Open Scholarship.” I note the values symmetry between open scholarship and the founding ideals of the open university movement. The study notes the special role and requirements of technologically induced innovation, notably the requirement for faculty and students to develop their net presence.

Much has been written (often by technology evangelists and promoters) about the supposedly profound difference between the so-called 'net generation' and those of us born before its widespread use. In "Beyond the Net Generation Debate: A Comparison between Digital Learners in Face-to-Face and Virtual Universities," Spanish authors present the results from a study showing how the educational model (face-to-face or online) has a stronger influence on students' perception of usefulness regarding ICT support for learning than the generational differences of online and classroom students.

American authors in "Sense of Community in Graduate Online Education: Contribution of Learner to Learner Interaction" determine which activities are most effective in creating learning community and which are the most commonly used. Like the last study, this study examines the impact of various learning designs and activities on students' perception of community in online courses.

Despite the limitations of 140 characters, microblogging using Twitter has become a very popular tool for alerting, communicating, whining, and recommending in social, political, and business contexts. But does it have a meaningful role in online learning? In an American study, "Mobile Microblogging: Using Twitter and Mobile Devices in an Online Course to Promote Learning in Authentic Contexts," the authors show a number of positive learning and social effects resulting from use of this tool.

In "Student Access to and Skills in Using Technology in an Open and Distance Learning Context" the authors from South Africa describe their investigation of students' access to and capabilities using technology within the broader discourse of the "digital divide." Their findings challenge a simplistic understanding of the digital divide and reveal that the nature of access is varied.

Our final research article, "Emotional Presence, Learning, and the Online Learning Environment" investigates the impact of emotion on how online learning is experienced. This Canadian study provides evidence of emotions in online learning communities, suggesting that emotional presence may exist as a key element in an online community of inquiry.

Open educational resources are constantly debated in education technology circles because they offer the potential to both reduce cost and improve open learning content. But does that mean they are widely used in distance education production? In a field note, "A Needs Assessment of Open and Distance Learning (ODL) Educators to Determine their Effective Use of Open Educational Resources (OERs)," the author looks at the challenges of adoption and integration of this innovation in Nigerian dual-mode institutions. There is also a leadership note in issue 13(4) that explores the differences between leadership and management and concludes that "leadership without ongoing personal transformation is little more than management."

The issue concludes with a thoughtful review by Diane Carver of Canadian Linda Harasim's 2012 book, *Learning Theory and Online Technologies*. The review provides a nice overview of this book, which looks both to the learning theory past and the collaborative future of online learning.

Athabasca University 



## An Investigation of Collaboration Processes in an Online Course: How do Small Groups Develop over Time?



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### Abstract

This study investigated communication patterns and behavior in problem-solving groups in a graduate online course. An inductive qualitative analysis method was employed to analyze 732 messages that were retrieved from small group forums. The current study identified a temporal pattern of group development was in comparison with existing theoretical models: the traditional group development model (Tuckman, 1965; Tuckman & Jensen, 1977) and the punctuated equilibrium model (Gersick, 1988; 1991). All the groups had two working phases and three decision-making points. The temporal pattern of group behavior was close to the phase transition concept of Gersick's model. Some groups tended to undergo Tuckman's stages, but their development stages were not necessarily sequential or hierarchical. Thus, it is concluded that Gersick's model could be more useful for researchers and instructors to better understand and assist online students in problem solving collaborative activities.

**Keywords:** Group development; collaboration; communication; behavior; problem-solving

### Introduction

Collaborative learning is a central theme of research and instructional design in online courses. The benefits of collaboration in groups have been confirmed in literature in terms of higher academic achievement, developing higher levels of reasoning and critical thinking, deeper engagement and improved analytic skills, and improving teamwork skills and interpersonal skills (Smith, 2008). Collaboration skills are highly valued in today's workplace (Wang, 2010) and thus important for students in higher education (Walton & Baker, 2009).

Problem-solving activities in small groups are frequently employed as an instructional method to foster collaboration in current online courses. The problem-solving activities can be designed along a continuum from well-structured to ill-structured (Jonassen, 1997). A well-structured problem-solving activity supplies learners with clearer guidelines for an identified goal, a constrained set of rules, and optimal solution paths (Ferreira & Lacerda Santos, 2009). An ill-structured problem-solving activity is designed to allow learners to engage in more complex collaboration processes with divergent ideas and experiences shared among individuals to reach convergent thinking in knowledge building, and commonly based on assumptions and methods of constructivism and situated cognition (Jonassen, 1997). Knowledge coconstruction and advancement (Bereiter & Scardamalia, 2003) and learning from/with peers (Vygotsky, 1978) can occur as learners collaboratively verify problems; relate the problem's goals; clarify alternative perspectives; generate solutions; gather evidence to support/reject positions; determine validity/construct arguments; implement and monitor solutions; and adapt solutions (Jonassen, 1997).

Collaboration in a problem solving activity demands complex learning skills for engaging in constructive arguments as well as proposing alternative solutions to reach a consensus for the best solution (Ferreira & Lacerda Santos, 2009). A group should develop strong cohesion and trust so that members can freely challenge each other's opinions/knowledge/ideas to seek a better solution (Fisher, 1970; Smith, 2008; Tubbs, 1995). Some groups may struggle throughout collaboration processes and others may avoid conflicts among members that can arise in the collaborative approach and thus take the cooperative approach of simply dividing the group's task into individually assigned portions, assembling the partial results into the final output (Dillenbourg, Baker, Blaye, & O'Malley, 1996). Careful monitoring and facilitating of the group process has been emphasized to ensure the quality of collaborative learning in online courses (Jahng & Bullen, 2012; Jahng, Nielsen, & Chan, 2010; Zhang, Peng, & Hung, 2009).

A comprehensive understanding of group process and participation behavior can provide educators and researchers with insights for better planning and assisting learners. This study aims to provide a vivid description of collaboration processes in a problem-solving activity in a graduate online course. Conducting an inductive qualitative analysis on asynchronous communication transcripts, the research identifies a pattern of group changes and examines the factors hindering or facilitating collaboration in each group.

The research questions are (1) How do groups develop or change over time to complete a group project? and (2) What are the problems identified in individual groups through the collaboration process?

## Literature Review

For decades now, researchers and theorists have proposed various models to explain how groups develop over time (Gersick, 1988) and whether all groups change according to a similar pattern (McGrath & Tschan, 2004). Tuckman's (1965) group development model

has been most frequently cited and supported in the literature (Wheelan & Lisk, 2000). Tuckman's model consists of four sequential stages (i.e., forming, storming, norming, and performing) through which group members should accomplish specific types of interactions. Forming is characterized by members' dependency on the designated leader while the group deals with inclusion issues and some concerns about safety. Storming refers to a period of counter-dependency and fight. At this stage, members often disagree among themselves about group goals and procedures. Norming is a period of establishing trust among members and building group structure, which is characterized by more mature negotiations about roles, organization, and procedures. The final stage, performing, is a time of intense team productivity and effectiveness. Tuckman and Jensen (1977) updated the model by adding a fifth stage (i.e., adjourning) at which a group disbands after completing a group task.

Subsequent models have repeated similar concepts to Tuckman's model with minor alterations (Gersick, 1988). For example, McGrath (1991) suggests the four modes of inception, technical problem solving, conflict resolution, and execution. Fisher's model (1970) includes the four linear stages of orientation, conflict, emergence, and reinforcement. Tubb's model (1995) proposes four phases of decision-making processes (orientation, conflict, consensus, and closure). Salmon's (2002) five-stage e-learning model, which has been adopted as a standard learning model for online courses in many institutions in the UK, also presents similar concepts for each stage: Stage 1 (access and motivation), 2 (online socialization), 3 (information exchange), 4 (knowledge construction), and 5 (development).

Gersick's model (1988; 1991) deviates from the prevailing view of traditional group development models. Gersick (1988) examined the life-spans of eight naturally occurring project groups and found that the groups did not go through a universal series of stages across time, as traditional group development models would predict. Rather, it proposes the punctuated equilibrium model to describe the groups' changes as Phase 1 – transition – Phase 2 across time:

Phase 1, the first half of groups' calendar time, is an initial period of inertial movement whose direction is set by the end of the group's first meeting. At the midpoint of their allotted calendar time, groups undergo a transition, which sets a revised direction for phase 2, a second period of inertial movement. (p. 17)

Researchers such as Wheelan, Davidson, and Tilin (2003) and Johnson, Suriya, Yoon, Berrett, and LaFleur (2002) recognize Gersick's model as a noteworthy threat to the dominant view on group developmental stages across time. Wheelan and colleagues investigated the verbal behavior patterns and perceptions of 26 groups. They report that the findings of the study supported traditional models of group development and cast doubt on Gersick's punctuated equilibrium model. Johnson and colleagues described the community-building process of virtual learning teams by conducting both an inductive qualitative analysis and a quantitative analysis on survey data collected from 36 graduate students. The authors

initially considered both Tuckman's (1965) and Gersick's (1988) models as frameworks for the study, but they found their data fit better with Tuckman's model. They reported that the virtual teams went through three stages of forming, norming, and performing, but there was "no evidence of the storming stage" in each group (p. 385).

Skipping the storming stage in online courses should be taken seriously with respect to the quality of collaborative learning. As Wheelan and Lisk (2000) report, the storming stage is "necessary for establishment of trust and a climate in which members feel free to disagree with each other" (p. 727). Avoiding constructive conflicts may lead to superficial collaboration. In this regard, quite a few studies about online collaborative learning have reported that only a small percentage of groups productively accomplished tasks by reaching a fully developed stage in online courses (e.g., Francescato, Porcelli, Mebane, Cuddetta, Klobas, & Renzi, 2006; Johnson, Johnson, & Stanne, 2000).

Understanding group development patterns and members' behavior changes through the collaboration period provides insights to better assist online students. Tuckman's (1965) stage model may not describe precisely the collaboration process in terms of how the members solve problems by resolving conflicts and overcoming specific online obstacles. Online project groups that are engaged in problem-solving activities may reveal specific patterns of group dynamics and decision-making behaviors. Gersick's (1988) mid-point transition may inspire online educators. Motivated with these assumptions, the current study conducts an inductive qualitative analysis on asynchronous communication scripts exchanged during a problem-solving activity in a graduate online course.

## Method

An inductive qualitative analysis approach was employed to identify the emerging pattern of group changes. The coding and analysis approaches are similar to the methods employed in Johnson et al. (2002) and Gersick (1988), which are based on grounded theory (Glaser & Strauss, 1967). Instead of using priori categories within a particular theoretical model, the researcher read the communication scripts repeatedly and summarized specific behaviors and dynamics occurring in each group. Following open coding procedures (Glaser, 1992), a message unit was used for the summary, focusing on the following items: (a) when, specific time points (month, date, time); (b) what, discussion subjects (cognitive, social, procedural topic); and (c) how, decision-making process (proposing, dis/agreeing, resolving conflicts, overcoming troubles, reaching consensus). The next step was to identify congruent patterns across the included groups even though the details in each group may be heterogeneous. The patterns were interpreted in comparison with the existing theoretical models in terms of which model better explained the findings. Detailed description of the findings was done in a qualitative exploratory case study to provide a holistic picture of group dynamics and reveal critical behaviors and factors occurring in each group (Krathwohl, 1998; Merriam, 1988; Yin, 2003).

Data (732 messages) were retrieved from six group forum spaces of an online course of an

educational technology program. Twenty-four graduate students were enrolled in the on-line course that was delivered for 13 weeks through the WebCT Vista course management system.

The small group problem-solving activity was designed to require students to write a group paper as an assignment. There were two types of problem options for each group to choose. Option 1 was to analyze a real example of institutional planning for e-learning and the use of learning technology. The groups who had chosen this option had to read and analyze a series of documents that were produced as part of the planning process. These documents were supplied on the course Web site. In addition, the groups needed to do some background research on the institution to fully understand the context. The group paper was intended to answer a list of questions based on their analysis and research. Option 2 was to create an imaginary case to recommend a vision for the use of e-learning. The information for the two options was posted on the course Web site at the beginning of the course (January 7, 2008). The students were told to allocate themselves into a group. The submission deadline for the group paper was firmly set (March 3), but no formal guidelines were announced about when and how to start the activity. The assignment mark for the small group activity was 35% including 5% peer-evaluation of the final course mark.

## Findings

A temporal pattern of group behavior changes across the six groups is presented in Figure 1. The figure represents how the groups moved toward making decisions that were necessary for completing the group paper. All the groups went through three decision-making points (DM1, DM2, and DM3) and had two working-phases (working-phase 1 and 2) between the decision-making points. The first decision-making point (DM1) was for selecting a problem from the given two options. The second decision (DM2) was for structuring the group paper that was going to be the basis for dividing the task into individual portions. The final decision (DM3) was to reach a consensus for completing and submitting the paper. During working-phase 1, the groups that had selected problem option 1 spent time mostly on reading the documents provided on the course Web site while the other groups working with option 2 was brainstorming to create an imaginary context of a case. The working-phase 2 was a time period of writing individually, commenting on each other's works, compiling the individual pieces, and editing the compiled paper.

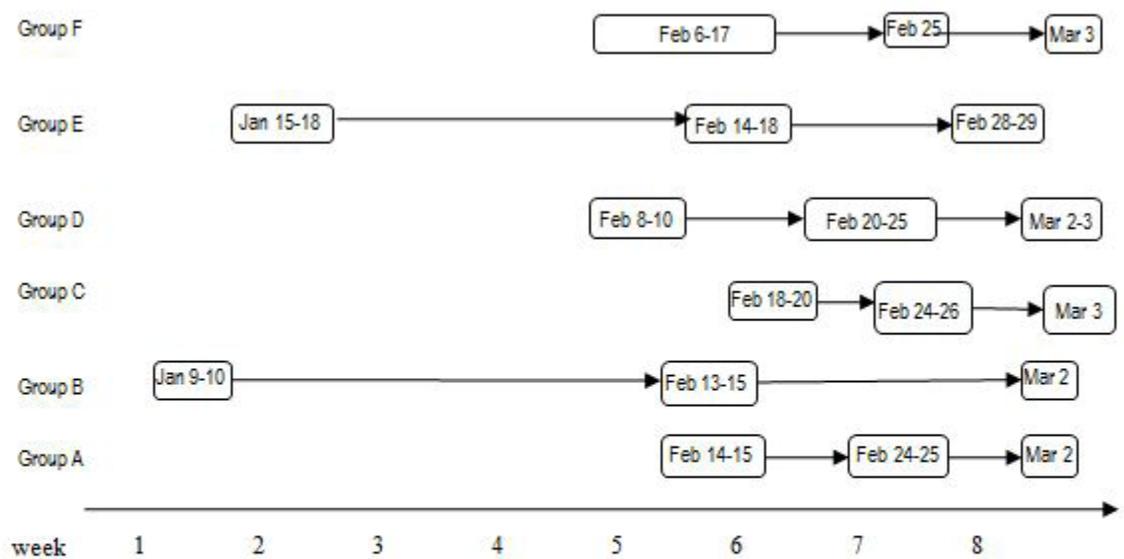


*Figure 1. Temporal pattern of group collaboration process.*

Although groups performed similar tasks during these phases in either option, each group revealed completely heterogeneous group behaviors. Not only the timing of decision-mak-

ing points and the duration of the working-phases were different, but also the types and levels of group work strategies varied widely. Some groups started the group work much earlier than the others; some groups spent much longer time in decision-making than others (Figure 2).

Details of the similarities and differences as well as facilitating and hindering factors for group collaboration are described in the following sections. In the provided excerpts from group forums, individual members are identified by anonymous codes composed by two characters: an alphabet upper case (A to F) and a digit (1 to 5) to indicate the group and its individual member, respectively. Writings in italic in brackets are interpretive comments added by the author.



Note: the dates correspond to each of the 3 decision-making (DM) phases.

Figure 2. Individual groups' decision-making points.

### Decision-Making 1 (DM1): Topic Selection

Two problem options were given for each group to choose as described in the Method section. The subject of the first thread in each of the six groups' forum postings was about choosing one of the options. Four out of six groups (A, B, D, and F) chose option 1 (real-case analysis) while two groups (C and E) chose option 2 (imaginary-case design). All the groups except for Group F made a quick decision to select the problem option after exchanging several messages over a period of one or two days. Each group generally followed a similar process: One member expressed his/her preference for an option with a brief explanation of the reason or rationale and then the other members agreed or disagreed until the group reached a consensus. Group F, however, really struggled in this process. The group spent the initial 10 days out of their total 25 days for doing the group activity to choose an option.

The problem in this group appeared to be that individual members did not clearly express their preference for a particular option.

F4: Hi there, I'm ok with either option.

F3: Either option is fine with me.

F4: just re-read the thread and was wondering if we've actually decided on option 1 or 2.

F1: If you want option #2 and the others in our group are happy with that - that's ok with me too. How to start?  
(*This implies somebody would lead the project.*)

### Working-Phase 1: Reading Materials/Creating Context

Working-phase 1 included the time period after selecting the problem option until reaching a next agreement on a paper structure for job division. The four groups that chose option 1 (real-case analysis) began reading the documents provided on the course Web site. The other two groups working with option 2 (creating an imaginary case) began discussion to prepare a context. During working-phase 1, each group revealed different communication relationships and behaviors in terms of taking a collaborative, cooperative, or individualistic approach. Some technology problems and personality conflicts began to arise. Some groups made an effort to build team morale while others made no such effort.

Group B exhibited ideal behaviors for the collaborative learning process. The group decided that each member would take responsibility for answering two or three questions and share notes of the readings in Google Notebook. As shown in the following excerpts, the members used nicknames (e.g., Mr. T), used socializing words for building teamwork (e.g., "Hey Team"), and made jokes throughout the period.

B2: Hey Team, I had a thought ... What if instead of answering all the questions and divvying up the readings we do all the readings and divvy up the questions? ...  
Cheers, Mr. T.

B1: Good idea, Mr. T. I think we all need to read through all the readings too.

B3: ... I am dyslexic (*humor*), and the likelihood of me having read all of the papers in time is low. I will see how far I can get though.

B2: I gather the real key documents are ... (*the list of key documents*).

Group D used a similar strategy to Group B in terms of splitting questions for individuals to manage, but the group work process was quite different. The group proceeded through working-phase 1 in a very cooperative manner. For instance, D3 thought the 'individualistic approach' would be efficient in answering the questions. When D1 made a suggestion to work in a Wiki page, D3 was against the idea and created a rubric table for individuals to fill out answers for each of the questions. Each person would then be responsible for a portion

of the rubric/table:

D1: Hi ... To assist us in collaborating for our assignment, I have created a Wiki page for us, ...

D3: Hi: Wiki good idea, well suited developing thoughts further when perform further research. Would prefer though that individually compile initial thoughts to avoid group think....Attached is the Rubric. Please complete & post, can then discuss... I will convert it into a draft paper...

Group A, which made a very late start (see Figure 2), moved quickly to choose the questions for option 1. One member took a lead role in the group by posting a message to notify the members of her having set up a Google Doc and started some notes as responses to the questions posed in the assignment description. She asked the members to comment and correct her points. The group planned to simply answer the questions in point form and then smooth them out to complete the task. The group did not communicate in the forum again until they were ready to structure the paper.

Group F was even quieter in the forum and seemed to be lost, failing to build up teamwork or leadership. F4 suggested having synchronous chats, but others did not respond to her suggestion. F3 once posted a very long message based on his reading and research related to the topic. Only one member, F1, responded to the long post with a short comment: “Interesting background, F3. It also gives a sense of the work after the dissolution of (the institution). Thank you!” The group did not exchange any informal messages with humor or personal information for socializing purposes.

Groups C and E started to exchange ideas to create a context for a vision of e-learning (option 2). Both groups recognized a need to have synchronous chats. However, scheduling a meeting time was not easy for the members who were living in dispersed geographical zones and working full/part-time. Group C consisted of three members while Group E had five. Group C started to brainstorm ideas through synchronous chatting in Vista Chats or MSN, but not all members could attend all meetings. Instead, the group meet in pairs and posted a chat summary for the third member. Unlike Group C, synchronous brainstorming did not happen in Group E. Although E4 was persistent in requesting voice chats, the other members preferred to stick to asynchronous communication. Even with the initial disagreement on a strategy for better communication, collaboration in this group was smooth in the absence of voice chats. The group overcame a conflicting idea over tools because other members persuaded the member who suggested the synchronous chats in a patient manner. Instead of having synchronous chats, the group decided to post messages frequently as they brainstormed ideas for deciding on a context.

### Decision-Making 2 (DM2): Structuring/Dividing the Job

After working-phase 1, the groups began to check the due date and to feel time pressure. All groups recognized the need for an outline/structure of the group paper to which members

would add details. The DM2 made groups speed up their work processes and encourage members' contribution. Based on discussions with readings or ideas, each group posted a structure of a paper in the forum. Three groups (B, C, E), where members communicated smoothly during the first working-phase, produced the structure by reaching a consensus. On the other hand, in groups A, D, and F, one member proposed a structure of the paper with headings for sections and suggested the members to take some sections to write up. Without having much discussion, the other members simply picked one or two sections. This decision-making was the major transition to enter the working-phase 2.

### Working-Phase 2: Writing Individually, Compiling, and Editing

Working-phase 2 was a period of individual work after structuring and dividing the jobs. Communication revealed how groups struggle in narrowing opinion gaps and negotiating discrepancies. As the group process became more complex, emotional conflicts occurred more frequently. Some groups (B and E) dealt with problems more successfully based on their strong team spirit while others (D and F) failed to overcome technology problems and personal conflicts. Some groups (A and F) took a more cooperative approach through which they simply assembled individual pieces of work to complete the task without seriously attempting collaboration. Factors facilitating or hindering groups' collaboration processes can be seen in examples from the groups.

Group B maintained high team spirit as all the members were engaging in collaboration. While writing individual sections, the members continually asked questions of and expressed concerns to the other group members. They assisted by answering each other's problems and concerns promptly, which helped to reduce inconsistencies when they combined the individual pieces into a collected version. The members continued exchanging humor, jokes, and emotional encouragement, and shared informal information:

B3: If we are the A-team, can I be Murdock?

B4: Guess you've got a good supply of t-shirts! :) Only if I can be Face .... more for the name than the character :).

... Hey ya Murdock ~ ...

B1: you are right, Mr. T.

The final editing process in Group C was very intensive. The group successfully managed extreme anxiety with the time pressure through meetings at MSN. Even though the group had some chats during the individual writing period, the members found many overlaps, inconsistent concepts, and irrelevant arguments. They began to edit it by taking turns and attached the developing document to post on the group forum. The members seemed to be online constantly for the last two days before submission. They posted messages to arrange synchronous meetings as well as posing updated versions each hour.

*(March 2, one day before submission)*

C3: ... I have spent a lot of time re working some of the content. ...

C1: It's 9:00 am ... I'll let you know what I think and post

my comments within the half hour.

C2: ... I will hold off posting my update until after we meet. I'll talk with you at 10:00.

The high level of positive collegial engagement in Groups B and C was not found in Groups E and D whose technical difficulties seemed to interfere with their interactions. Both Groups E and D worked on the Wiki, but the troubles and stresses in Group D were distinctive. One member in Group E knew how to export Wiki documents for reformatting into a Word document. Group E thus saved much time and effort in comparison to Group D. On the other hand, Group D also faced problems as a result of poor Internet connection in a remote area, confusions with the Wiki, and incompatible file extension formats for down- and up-loading files:

D3: ...Am curious why the extension would affect the download.... Its on the wiki too but its a poor medium as all formatting is lost between transfers....Maybe am edgy, but why the sudden switch to google and dropping of version numbering... Please just use this thread to post with appropriate version number (lets not waste time changing processes and try to follow google docs, email, vista...).

Group D used many negative words that expressed anxiousness, even blaming their peers as inattentive or inconsiderate, which exacerbated troubles and brought conflicts to such an extreme level that resolutions became impossible. Conflict between D3 and D1 became so excessive that they poured out harsh feeling toward each other:

D1: D3, With all due respect, I believe it would have been more meaningful if your responses would have been more factual and if they would have taken into consideration the unique circumstances some of your fellow course colleagues encounter, who happen to reside and work in different time zones, .... I happen to believe very strongly in the concept and in the application of collaborative group work, but, I also, equally, strongly believe that this can only significantly be achieved, if every participant is mindful, without questioning each other's motives and/or technical ability, of the fact that every group member may experience unforeseen circumstances, which may inadvertently conflict with the time schedule of others.

D3:D1, I asked why you did not do something that you thought needed to be done, that a personal attack; Interesting explanation though, ... I need to be more factual. The good news, its almost due.

Group A seemed to wish simply to split up the task to individuals for later compilation to complete the assignment. Once taking on their own sections of the paper, individual members started working separately without communicating with each other. After working for about two to three days, they put drafts of their individual sections into a Google Doc. There were no obvious conflicts/arguments. The editorial process was quick, as had been the process of picking the topic option and dividing up tasks. After compiling individuals' writing in the Google Doc, they took turns to proofread others' sections to complete the group work.

Group F attempted to work on a Google Doc to produce a collective paper. One week before the submission date, F1 posted a detailed schedule to move the process forward and encouraged members to discuss and clarify their ideas. However, the group members were very quiet on the Google Doc as well as in the group forum space. The final paper had to be stitched up by F1. This group obviously failed at collaborative group work.

F1: I've shared a document with you called... I spent two more hours or so on the document this morning. Hopefully you will have time this evening.

*(Only F3 responded to the post.)*

F3: Hi F1, I am going to edit some content in our document at Google Doc tonight...

### Decision-Making 3: Submitting and Adjourning

Decision-making 3 was to finalize the group paper after having rounds of editing earlier versions. Final messages posted in the group forum with an attachment of the completed version of the group paper revealed how the groups had been through the group work process. As the following excerpts show, the messages from three groups (B, E, and C) request other members to 'double check' (B4) and post final 'comments' (E1 and C1) on any errors. These groups had worked collaboratively as all the members had engaged in the group work process. Thus, the finalizing person sought a consensus of approval for the version. The messages from Group B and E, in particular, contain many exclamation marks and/or smile emoticons indicating their satisfaction and excitement in completing the work.

B4: Dear Team. Please double check the references before submitting the version. I've made sure they were consistent and alphabetized like 3 times, but when I check the attachments to this discussion board - it always seems to be an old version!!! Anyway. This version (I believe) should be the final! ...

E1: Hi All, I posted this as a pdf in the Final Draft thread in the WIKI .... Please post comments here by Saturday 5pm PST ... We are done - unless someone sees a spelling error or something very tiny! :) Looks great guys. I am amazed at how well it flows after all! ...

C1: I've read through it a couple of times now. ... I feel that it is pretty comprehensive and I think we'll be fine submitting it. I will be back online after 8 to see if there were any comments from you.

By way of contrast, the final messages from Groups A and F were short and dry. The tone of the messages is very assertive, seemingly not allowing or expecting any further revisions on the version by the other members. No social and emotional expressions were included in the message.

A1: Hi everyone, Here is the final copy. As you all know, we each have to submit a copy.

F4: Here's the final copy. I think.

Group D struggled with personal conflicts and members' attitudes. D3, in his final message, notified the members of what he did and why without asking members' opinion or consent.

D3: Hi there: The reason for the word count was under the course resources, ... *(He writes a long paragraph about APA style, file format, and word count requirements for the assignment, etc.)*

Interestingly, two groups, B (the most collaborative group) and F (the least collaborative group), posted some messages after completing the group activity. Group B debriefed their group experience with satisfaction as well as expressing the wish to work together again sometime. B1 even wanted to visit B4 to talk about something in person. They exchanged phone numbers and personal schedules to meet sometime. When they checked their group grade, everybody felt this was a happy ending of the group's work. F1, who led Group F, posted a brief message with some disappointment after checking his group mark, but no one in the group responded to the message.

## Discussion

The purpose of the study was to investigate group processes during a problem-solving activity in order to identify a pattern of group behavior as well as problems and issues that arose through the collaborative learning process. Findings in the above section reported a temporal pattern of group changes and the differences in and similarities of individual groups' behavior within the pattern. This section discusses the findings in relation to the existing literature, suggests further research topics, and recommends some instructional strategies as well as design principles.

## Gersick's Time Phase Model versus Tuckman's Hierarchical Stage Model

The groups involved in this research moved toward completing the group assignment by making three decisions and having two working-phases between the decision-makings. The pattern across the activity timeline appears similar to Gersick's (1988) punctuated equilibrium model. In her model, a significant transition occurs at the mid-point of the group process, which "involves groups' revising their understanding of and approach to their work in response to time limits" (p. 36). The current study also found a transition point at the second decision-making point. Although the time point did not exactly match to the mid-point of the work period, four of the six groups reached the transition approximately at their calendar mid-point when they realized the time pressure and a need for a detailed outline of the paper structure in order to divide the workload. The other two groups could be exceptional because they made a much earlier start that may have allowed them to have a longer working-phase before the first transition.

Tuckman's (1965) group development stages were not visible in all groups' communication behaviors in this study. Not all groups moved sequentially through the hierarchical stages of group development and some groups avoided constructive conflicts, skipping the storming stage to strategically take a simple cooperative approach. Groups revealed different types of group behaviors in terms of adopting more individualistic, cooperative, or collaborative approaches to solve the problem. The more collaborative groups tended to move through Tuckman's stages more than less collaborative groups. Less collaborative groups rarely communicated until they had to make the second decision, so they skipped one or more of the forming, storming, and norming stages. More collaborative groups, which took more team-oriented approaches to solve the problem, underwent some of the group development stages, but these stages were not necessarily sequential or hierarchical. One or more stages were skipped in some groups while multiple stages occurred at the same time in other groups.

The timeline model depicted in the current study as well as in Gersick's (1988) can explain group changes better than Tuckman's traditional stage model. The fact that groups should make critical decisions by certain time points and have working-phases between the decision-making points gives useful and practical information for designing and instructing small group activities. Since time is a critical factor influencing more collaborative work in groups, designers and instructors should be mindful of the timeline. The groups could be helped to move more promptly if the course provided detailed guidelines with specific time points for group procedures.

## Communication and Collaboration Tools

The course that was the focus of the current study was designed to allow groups to select one of two typical problem-solving activities, that is a real-case analysis (option 1) or an imaginary-case design (option 2) (Jonassen, 1997). More groups, four out of six, selected option 1 perhaps believing that more readings and analysis would be easier than more brainstorming and negotiation to create a new case. This could be different if the activity setting were a face-to-face course where groups might prefer option 2 or show no prefer-

ence with the options. The result and the assumption can be interpreted in consideration of the limitations of asynchronous and synchronous communication tools. According to Mabrito (2006), synchronous tools are beneficial for producing new topics and ideas (69%) as compared to asynchronous communications (47%). Only one used synchronous tools. This same group also experienced problems using different types of synchronous communication tools (Skype, Vista Chats, or MSN). Time delays in their asynchronous communication as well as other technology problems such as Internet access and file formats caused anxiety and personal conflicts. The collaboration tools for writing and editing (Wiki or Google Docs) also caused many troubles owing to the nature of the tools (e.g., formatting issues) and students' lack of familiarity with the tools. Thus, designing and instructing problem-solving activities should be based on careful consideration of appropriate and available tools and students' skills and familiarity with the tools.

### Importance of Social Communication

The importance of social communication has been confirmed in this research and aligns with literature in this area. Having an ice-breaking period at the beginning of the group activity was particularly helpful for building a strong bond between members. Group members introducing themselves to each other by sharing personal stories and information resulted in better understanding among group members and helped them to establish warm feelings toward each other. The course should be designed to encourage social communication with some specific activities for ice breaking during the initial period. Using positive words for appreciating others' work can have the effect of cheering up the members. Making jokes and using nicknames are all facilitative communication acts for maintaining and strengthening team spirit. Students entering collaborative group work should recognize that negative words expressing anxiousness, blaming, negligence, or bossy attitudes are unhelpful, often exacerbating troubles and bringing conflict to such a level that resolutions become impossible. Instructors should encourage and remind students that indecisive and ambiguous uses of language also have negative effects on the collaboration process. Individual students need to express their opinions clearly rather than positioning themselves in a grey area. Further research is recommended to identify practical ideas for promoting social communication and also for grouping methods to mix and match more or less active students in consideration of their diverse characteristics and abilities.

### Limitations

This is an exploratory study that still has much scope for expansion/refinement in future studies, so the findings of the study should be viewed with some caution. The small groups analyzed in this study were from a graduate online course, which was designed to include a group problem-solving assignment. Thus, the results may not be generalized directly to other types of small groups. Nonetheless, a comprehensive description of group changes/development and some of the challenges occurring over time provides researchers and educators with insight into and a better understanding of online groups. Further research is encouraged to examine the effect of the instructor's intervention on groups' behavior changes across the time frame for making specific decisions as well as to investigate different group-

ing methods in terms of mixing and matching members to form a collaborative group with members who actively participate.

## Conclusion

This study examined communication patterns and behavior in problem-solving groups in a graduate online course. A temporal pattern of group changes was identified which consists of three decision-making points and two working-phases. The pattern resembles the concepts of Gersick's (1988) punctuated equilibrium model and differs from some of the propositions of Tuckman's (1965) hierarchical stage model. Looking at individual group behavior across the time frame for the problem-solving activity, some groups were more collaborative while others were individualistic or cooperative. Those collaborative groups underwent some stages of group development, but the stages were not necessarily sequential or hierarchical. The study concludes that the timeline model may better explain group changes and be more useful and practical for course designers and instructors to understand group collaboration processes. The study also found many problems and troubles associated with technology and geographical distance that are regarded as typical limitations of online communication. The findings imply online groups may be more fragile than face-to-face groups in terms of overcoming emotional frustration and personal conflicts and thus recommends careful design and strategies to support group changes across the time frame of group activity.

## Acknowledgment

I thank the anonymous reviewers for their constructive comments that helped to improve the quality of the paper. I also thank my friend and colleague, Dr. Wendy Nielsen, for her time and effort in editing.

## References

- Bereiter, C., & Scardamalia, M. (2003). Knowledge building environments: Extending the limits of the possible in education and knowledge work. In A. Di Stefano, K. E., Rudestam & E. R. Silverman (Eds.), *Encyclopedia of distributed learning* (pp. 269–272). Thousand Oaks, CA: Sage.
- Dillenbourg, P., Baker, M., Blaye, A., & O'Malley, C. (1996). The evolution of research on collaborative learning. In E. Spada & P. Reiman (Eds.), *Learning in humans and machine: Towards an interdisciplinary learning science* (pp. 189-211). Oxford: Elsevier.
- Ferreira, D. J., & Lacerda Santos, G. (2009). Scaffolding online discourse in collaborative ill-structured problem-solving for innovation. *Informatics in Education*, 8(2), 173-190.
- Fisher, B. A. (1970). Decision emergence: Phases in group decision-making. *Communication Monographs*, 37, 53–66.
- Francescato, D., Porcelli, R., Mebane, M., Cuddetta, M., Klobas, J., & Renzi, P. (2006). Evaluation of the efficacy of collaborative learning in face-to-face and university contexts. *Computers in Human Behavior*, 22(2), 163-176.
- Gersick, C. J. (1988). Team and transition in work teams: Toward a new model of group development. *Academy of Management Journal*, 31, 9–41.
- Gersick, C. J. (1991). Revolutionary change theories: A multilevel exploration of the punctuated equilibrium paradigm. *Academy of Management Review*, 16(1), 10-36.
- Glaser, B. G. (1992). *Emergence vs. forcing: Basics of grounded theory analysis*. Mill Valley, CA: Sociology Press.
- Glaser, B. G., & Strauss, A. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Chicago, IL: Aldine.
- Jahng, N., & Bullen, M. (2012). Exploring group forming strategies by examining participation behaviours during whole class discussions. *European Journal of Open, Distance and E-Learning*.
- Jahng, N., Nielsen, W., & Chan, E.K.H. (2010). Collaborative learning in an online course: A comparison of communication patterns in small and whole group activities. *Journal of Distance Education*, 24(2), 39-58.
- Johnson, D. W., Johnson, R. T., & Stanne, M. B. (2000). *Cooperative learning methods: A meta-analysis*. Minneapolis, Minnesota: University of Minnesota.
- Johnson, S. D., Suriya, C., Yoon, S. W., Berrett, J. V., & LaFleur, J. (2002). Team devel-

- opment and group processes of virtual learning teams. *Computers & Education*, 39(4), 379-393.
- Jonassen, D. H. (1997). Instructional design models for well-structured and ill-structured problem-solving learning outcomes. *Educational Technology: Research and Development*, 45(1), 65-94.
- Krathwohl, D. (1998). *Methods of educational and social science research: An integrated approach* (2<sup>nd</sup> ed.). New York: Addison-Wesley Educational.
- Mabrito, M. (2006). A study of synchronous versus asynchronous collaboration in an online business writing class. *American Journal of Distance Education*, 20(2), 93- 107.
- McGrath, J. E. (1991). Time, interaction, and performance (TIP): A theory of groups. *Small Group Research*, 22(2), 147-174.
- McGrath, J. E., & Tschan, F. (2004). *Temporal matters in social psychology: Examining the role of time in the lives of groups and individuals*. Washington, DC: American Psychological Association.
- Merriam, S. (1988). *Case study research in education: A qualitative approach*. San Francisco: Jossey-Bass.
- Salmon, G. (2002). *E-tivities: The key to active online learning*. London: Kogan Page.
- Smith, R. O. (2008). The paradox of trust in online collaborative groups. *Distance Education*, 29(3), 325-34.
- Tubbs, S. (1995). *A systems approach to small group interaction*. New York: McGraw-Hill.
- Tuckman, B. W. (1965). Development sequence in small groups. *Psychological Bulletin*, 63, 348-399.
- Tuckman, B. W., & Jensen, M. A. C. (1977). Stages in small group development revisited. *Group and Organizational Studies*, 2, 419-427.
- Vygotsky, L. (1978). *Mind in society: The development of higher psychological processes* (Trans. M. Cole). Cambridge, MA: Harvard University.
- Walton, K. L. W., & Baker, J. C. (2009). Group projects as a method of promoting student scientific communication and collaboration in a public health microbiology course. *Bioscience*, 35(2), 16-22.
- Wang, Q. (2010). Using online shared workspaces to support group collaborative learning. *Computers & Education*, 55(3), 1270-1276.
- Wheelan, S., Davidson, B., & Tilin, F. (2003). Group development across time: Reality or

illusion? *Small Group Research*, 34(2), 223-245.

Wheelan, S. A., & Lisk, A. (2000). Cohort group effectiveness and the educational achievement of adult undergraduate students. *Small Group Research*, 31, 724-738.

Yin, R. (2003). *Case study research: Design and methods* (3<sup>rd</sup> ed.). Thousand Oaks, CA: Sage.

Zhang, K., Peng, S. W., & Hung, J. (2009). Online collaborative learning in a project-based learning environment in Taiwan: A case study on undergraduate students' perspectives. *Educational Media International*, 46(2), 123-135.

Athabasca University 



# Impact of OpenCourseWare Publication on Higher Education Participation and Student Recruitment



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## Abstract

The free and open publication of course materials (OpenCourseWare or OCW) was initially undertaken by Massachusetts Institute of Technology (MIT) and other universities primarily to share educational resources among educators (Abelson, 2007). OCW, however, and more in general open educational resources (OER),<sup>1</sup> have also provided well-documented opportunities for all learners, including the so-called “informal learners” and “independent learners” (Carson, 2005; Mulder, 2006, p. 35). Universities have also increasingly documented clear benefits for specific target groups such as secondary education students and lifelong learners seeking to enter formal postsecondary education programs.

In addition to benefitting learners, OCW publication has benefitted the publishing institutions themselves by providing recruiting advantages. Finally enrollment figures from some institutions indicate that even in the case of the free and open publication of materials from online programs, OCW does not negatively affect enrollment. This paper reviews evaluation conducted at Massachusetts Institute of Technology, Johns Hopkins Bloomberg School of Public Health (JHSPH), and Open Universiteit Nederland (OUNL) concerning OCW effects on higher education participation and student recruitment.

**Keywords:** Distance education; open learning; open universities; distance universities; higher education; e-learning; online learning

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<sup>1</sup> In this paper we will use one reference term only (OCW), just for convenience and being fully aware of the definition differences between OCW and OER. Only in the case of possible misunderstanding we refer specifically to OER.

## Background

### OpenCourseWare Publication

On April 4<sup>th</sup>, 2001, MIT announced its intention to publish the core educational materials, including syllabi, lecture notes, assignments and exams, from all of its courses freely and openly on the Web for use by educators and learners worldwide through a project dubbed “MIT OpenCourseWare.” MIT was soon joined in this effort by universities around the world for which the mission of openly sharing educational content resonated strongly with long-established and deeply held institutional commitments. Two such institutions were Johns Hopkins, through its Bloomberg School of Public Health and its longstanding commitment to improving global public health, and Open Universiteit Nederland, with its mission to make higher education accessible to anyone with the necessary aptitudes and interests, regardless of formal qualifications and with independent learning as its characteristic model.

OpenCourseWare materials as originally envisioned by MIT encompass the core documents provided to students in the MIT classroom setting, plus other digital resources, such as simulations, animations, and sample code, created in the course of normal instruction of MIT students; subsequent projects at MIT and elsewhere have extended the OCW concept to include materials specifically designed for free and open use on the Web.<sup>2</sup>

### MIT OpenCourseWare

Officially launched on October 1, 2003, MIT OpenCourseWare contains materials from more than 2,080 MIT courses. These courses widely cover MIT’s course offerings at both the undergraduate and graduate level, providing a comprehensive view into the Institute’s curriculum. MIT OpenCourseWare educational materials have reached an estimated 100 million individuals through the main site (see <http://ocw.mit.edu>); translation sites sharing 1,000 versions of MIT courses in languages including Chinese, Spanish, Portuguese, Farsi, and Thai; more than 290 copies of the site distributed to universities in bandwidth-constrained regions; and through secondary uses of the materials in the classrooms of educators worldwide. In 2007, MIT OpenCourseWare launched Highlights for High School, which identifies more than 2,600 resources within the MIT OpenCourseWare publication appropriate for US Advanced Placement study of biology, calculus, and physics. In 2010, MIT published the first 5 of a planned 20 “OCW Scholar” courses, designed specifically for use by independent learners with no access to supplemental resources.

### Johns Hopkins Bloomberg School of Public Health OpenCourseWare

Launched in May of 2005, JHSPH OpenCourseWare includes teaching resources from more than 100 academic courses, symposia, and trainings offered by JHSPH. Its goals are to provide a spectrum of educational opportunity that includes learners who cannot formally enroll and to support public health educators who require high-quality adaptable resources.

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2 One could say that this extension moves OCW into the OER domain.

Each JHSPH OCW offering features lecture materials and a course syllabus with learning objectives, and many include additional materials such as assignments, lab projects, and readings. Twenty-five offerings also feature audio or video resources. JHSPH OCW covers a wide variety of public health topics, such as infectious diseases, epidemiology, nutrition, reproductive health, and biostatistics. In 2008, the OCW Image Library was launched to improve direct access to the many illustrations and charts created for JHSPH OCW. In 2012, JHSPH OCW will launch a new Web site with the goal of making it easier for visitors to find, share, and use OCW materials.

## OUNL OpenER

In 2006 two open universities, in the UK and in The Netherlands, initiated a new OCW wave by making available a small part of their course base as OER. They combined their classical openness (open entry, freedom of time, pace, and place, open programming, and open to people) with the new openness of the digital era, in particular with OER (Mulder, 2006). Their learning materials are specifically designed for independent learning, putting the learner in the centre rather than the teacher. Clearly the combination of this OU model with OER offers great potential to increase and widen participation in higher education, which in Europe is an explicit ambition.

The OpenER project (Schuwer & Mulder, 2009) was set up as a 'portal of enticement' to higher education in The Netherlands. Existing barriers should be removed and the willingness of individuals to invest in learning be stimulated. The assumption was that free access to high-quality and attractive learning materials for self-study in an informal learning mode would facilitate this. The project has run from 2006 until 2008, has published 25 courses (at bachelor level, 25 hours study load each), and has attracted more than 1 million unique visitors. Spin-offs were the use of OpenER courses in secondary schools and the introduction of the so-called Spinoza Series in collaboration with the National Organization for Scientific Research. In this series Spinoza laureates<sup>3</sup> share their knowledge with a broad audience in OpenER type courses. Currently the OpenER course base is the free access part of the regular OUNL offering and is extended gradually.

## Data Sources

Data presented in this paper were gathered independently by researchers at the included institutions without prior coordination, largely as part of ongoing program self-evaluation. For that reason, data are not directly comparable from one institution to another. Researchers comparing findings noted complementary outcomes, which resulted in the development of this after-the-fact analysis. Coordination of data collection in future studies could enhance the comparability of data across institutions.

Gathering data on the use and impact of open resources such as OpenCourseWare has inherent challenges. Because audiences are broad and come to the sites freely, often with no

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3 The annual Spinoza Premium is the most prestigious research award in The Netherlands: 2.5 M€.

registration or prior identification, most data gathered comes from web metrics (which reveal behavior but not attitudes or intent) or from surveys and interviews of a self-selecting group of users assumed to be among the most engaged and supportive visitors to the sites. For this reason, the results presented should generally be understood as being representative of a relatively engaged subset of users. Notable exceptions are surveys of defined audiences who may or may not be familiar with the OpenCourseWare resources being investigated, such as the MIT and JHSPH surveys of new students.

Other studies regarding benefits and impact of OpenCourseWare or more generally OER are in most cases performed in the context of business models and questions about sustainability of offering OER. A recent overview is provided by Butcher and Hoosen (2012). Attracting around 6,000 enrollments and a forefront role in the area of open education are among the benefits of the OpenLearn project from the Open University UK (Lane, 2012). In the area of secondary education, Wiley et al. (2012) report significant cost savings when using open textbooks without loss of quality of learning materials. In a TED Talk early 2012<sup>4</sup>, Peter Norvig mentioned as institutional benefit from the so-called massive open online courses (MOOCs) the gathering of enormous amounts of students data that can be mined to improve education.

### MIT OpenCourseWare Data

Data regarding MIT OpenCourseWare for this analysis has been gathered through a series of surveys conducted by the MIT OpenCourseWare staff. These surveys include the following.

- Site visitor surveys: MIT OpenCourseWare conducts annual surveys of site visitors, collecting responses from at least 5,000 visitors over the course of four to six weeks. Surveys are conducted using a pop-up window or banner invitation on the site and are collected with an online survey tool. Completion rates for the surveys conducted 2004-2010 were typically 3-5% of invited visitors. As compared to web metrics, the sample over-represents returning as opposed to first-time visitors (survey samples are 60% returning whereas metrics indicate 30-50% of traffic is returning visitors).
- 2010 undergraduate survey: The entire undergraduate student population of 4,232 was invited by e-mail to complete a survey through an online survey tool, and 1,891 students completed the survey, yielding a 44.7% response rate. Skip logic was employed to direct respondents to appropriate questions based on prior responses. Respondents were entered in a random drawing to receive movie tickets as an incentive.
- 2010 graduate survey: The same type of survey was conducted among 6,152 graduate students, and 1,644 students completed the survey, yielding a 26.7% response rate.

This survey data is supplemented by interviews conducted with selected survey respondents and MIT community members.

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4 [http://www.ted.com/talks/peter\\_norvig\\_the\\_100\\_000\\_student\\_classroom.html](http://www.ted.com/talks/peter_norvig_the_100_000_student_classroom.html)

## Johns Hopkins Bloomberg School of Public Health OpenCourseWare Data

Data regarding Johns Hopkins Bloomberg School of Public Health OpenCourseWare for this analysis were gathered through two surveys, one conducted in 2006-2008 and the other in 2010 and 2011.

- 2006-2008: A survey was conducted of newly matriculated JHSPH graduate students using an e-mail invitation and online survey tool. A total of 1,859 students were invited over the course of 3 years, and 345 responded (response rate 18.6%). Skip logic was employed to avoid asking OCW-specific questions of students who were unaware of the program.
- 2010 and 2011: The same type of survey among all enrolled JHSPH graduate students. A total of 4,479 students were invited and 698 responded (response rate 15.6%).

## Open Universiteit Nederland OpenER Data

Data regarding OUNL OpenER for this analysis were gathered through two surveys (both conducted in 2008), a feedback form on the Web site (from 2006 to 2008) and an order form on the web shop of OUNL for ordering regular courses (from February to June 2008):

- 2008: A survey was conducted of regular OUNL students who in September 2007 - February 2008 were active in a regular course. A total of 8223 surveys was distributed of which 1,073 were returned (response rate 13%). (Source A)
- 2008: A survey was conducted of visitors of the OpenER site who voluntarily registered themselves. Registering was not mandatory in order to access the courses, but after registering an attention mail was sent each time a new course was added to the Web site. A total of 5,769 surveys was distributed of which 980 were returned (response rate 17%). (Source B)
- 2006-2008: Visitors were offered the option (on a voluntary basis) to submit a feedback form when they had taken a course or when they had examined a course but decided not to take it. A total of 2,268 forms were returned of which 428 visitors had completed an open course (Source C). After ending the project, the site with open courses was still online and visitors were still able to submit a feedbackform until 2-2-2010. During this period a total of 1,575 forms were submitted of which 320 visitors had completed an open course. (Source C')
- 2008: To gather evidence that OpenER influences users in their purchase of a regular course, a question was added to the electronic order form: "Was taking a free OpenER course a reason to order this course?" It was mandatory to answer this question with either "yes" or "no."

## Findings

### Higher Education Participation

While OCW was originally conceived at MIT as a tool for sharing course materials with educators, and educators were expected to be primary users of the site, the MIT OpenCourseWare staff documented from the start of the program the unexpectedly large number of so-called “informal learners” coming to the site. These were site visitors who were not currently enrolled in or teaching at an institution of higher education. In the early stages of MIT OpenCourseWare, informal learners were measured as just under 52% of site visitors, with 31% being students and 13% educators (Carson, 2005). More recent measures from the 2010 survey indicate that 43% of MIT OpenCourseWare visitors are informal learners, 42% are students, and 9% are educators. As early as 2003, MIT OpenCourseWare was able to document that 8% of informal learners were using the site to “plan a future course of study as a student.” By 2005, nearly 18% of informal learners indicated using the site to “plan a future course of study” (Carson, 2005).

Findings from OUNL surveys further the case that OER / OCW supports informal learners in planning a return to formal education. Sources A and B resulted in the following:

**Table 1**

*Did Visiting the Site with Open Courses Influence your Study Plans?*

	Source A N=316	Source B N=980
Yes, I am better informed about my <b>direction</b> of study	6.3%	18.6%
Yes, I am better informed about my <b>level</b> of study	3.8%	7.8%
Yes, I am better informed about <b>selfstudy</b>	5.4%	28.2%
No, I already knew what I wanted and I was only confirmed in my choice	23.1%	17.6%
No, offering open courses did not have any influence	66.5%	33.3%
No answer / otherwise	1.5%	6.2%

In a slightly different way the question about influence of OpenER on study plans was asked in sources C and C’:

**Table 2**

*Did Visiting the Site with Open Courses Influence your Study Plans?*

	Source C N=428	Source C’ N=320
Yes, I know I want to start studying	48.0%	49.0%
Yes, I know I do <b>not</b> want to start studying	4.0%	1.0%
Yes, other influence	17.0%	20.0%
No	31.0%	30.0%

Thirty percent of respondents were already enrolled in a program of formal education, both at OUNL and other institutions. OUNL also surveyed 1,684 students who purchased a course for credit, asking whether OpenER had influenced their decision to enroll in the paid course. Nine percent indicated this was the case (Schuwer & Mulder, 2009).

While both the MIT and OUNL data indicate that OCW can be an aid to or influence on informal learners considering a return to formal education, the figures do not reveal how OCW provides such support. On the MIT 2010 site visitor survey, 21% of independent learners indicated they were using the site to “plan a return to formal study.” These respondents were asked follow-up questions asking for more detail on how they were using the site for this purpose and how successful they were at achieving these goals (see Table 3).

**Table 3**

*Please Choose the Option(s) Below that Best Describe How You are Using the Site to Plan your Future Course of Study in a Formal Program.*

	Response Percent	I was completely successful	I was mostly successful	I was somewhat successful	I was not successful
Selecting subject area for study	52.6%	34.4%	37.3%	24.0%	4.2%
Reviewing basic knowledge from previous formal study	46.6%	38.6%	37.5%	21.0%	3.0%
Preparing for entrance exams	29.7%	40.2%	36.2%	21.3%	2.3%
Other (please specify)	10.1%	44.1%	30.5%	23.7%	1.7%

When presented with three more specific scenarios of use related to planning a return to formal study, the majority (53%) indicated using the site to select an area of study; a large percentage (46%) indicated using the site to review basic knowledge from previous formal study; and just under a third of respondents were using the site to prepare for entrance exams. For all of these subscenarios, more than 70% of respondents indicated they were “completely successful” or “mostly successful” at meeting their goals for visiting the site.

Ten percent of respondents chose “Other” as a response to the above question and provided a free-text description of their site usage. While many of these might be reasonably correlated to the above subscenarios (“preparation for exams,” “learning more about the field I would like to study eventually”), others provide interesting nuance regarding how OCW supports a return to formal study. One response demonstrates how OCW resources can support a transition from one field to another: “advance beyond prior study, as my B.A. was not math-related, but I wish to pursue M.S. in Mathematics.” Another response indicates how OCW can provide a “leg up” on learning, so that students are more comfortable with the materials they will encounter in formal study: “learning the material on my own so the concepts will be easier to grasp when I enter a formal course.”

Follow-up questions were also asked about the benefits generated through using the site to plan a return to formal education. Respondents were also asked to indicate the level of each type of benefit, providing insight into the relative amount of each benefit provided. These responses are summarized in Table 4.

Table 4

*For Each Potential Benefit of Using OCW Materials Below, Please Indicate the Level of Benefit You've Personally Received in Planning your Future Course of Study.*

	Very significant/ Significant benefit	Moderate/ Slight benefit	No benefit	Have not used OCW long enough to judge
Inspire you to enter/return to a formal program of study	69.0%	18.5%	3.6%	10.2%
Increase confidence that you can succeed in a formal program	71.3%	16.0%	2.6%	11.7%
Improve your decision making regarding choice of programs and classes	63.4%	19.6%	5.2%	12.2%
Save time in selecting a formal program of study	57.0%	22.9%	7.5%	13.1%
Accelerate your review of prior learning	68.8%	17.7%	2.8%	12.0%
Save time in preparing for entrance exams	52.5%	21.2%	9.2%	18.9%
Improve your performance on entrance exams	55.1%	16.8%	8.5%	20.7%

The above responses highlight the importance of access to higher education materials in providing inspiration for respectively developing confidence in considering a return to formal education. For these two options 69% and more than 71% of respondents rate the level of benefit as “very significant” or “significant.” A clear majority also assigns “very significant” or “significant” benefit to review prior learning (almost 69%) and to selecting programs and courses, both by improving decision-making (over 63%) and by saving time (57%). Finally, more than half of the respondents report “very significant” or “significant” benefit in improving performance on entrance exams (55%) and in saving time in its preparations (over 52%).

## Student Recruitment

The survey results presented above indicate that OCW can be an effective tool for helping learners make the transition between informal and formal study. This, however, does not necessarily indicate a direct benefit for the publishing universities. And they, of course, are keenly interested in documenting any ways in which OCW publication might improve their student recruitment, thus providing direct benefits.

### MIT.

The MIT OpenCourseWare staff has surveyed both undergraduate and graduate MIT populations to explore effects of OCW on student recruitment. The most recent survey results indicate that the site does help MIT to be more competitive in attracting students at both levels. A 2010 undergraduate survey indicates 57% of undergraduates were aware of the OCW site before they chose to attend MIT, and among them 31% indicate the site had a “very significant” or “significant” influence on their choice of school; a similar 2010 survey of MIT graduate students indicates that 45% of graduate students were aware of the MIT OpenCourseWare site prior to choosing the school they would attend, and 30% of those aware describe the site’s influence on their choice as “very significant” or “significant.”

Even early on at MIT, surveys of incoming freshmen indicated some effect on student re-

cruitment; on a 2004 freshman survey, 52% of incoming freshmen were aware of the OCW site, and nearly 11% of all freshmen indicated that OCW influenced their decision to attend MIT. At this time, MIT OpenCourseWare’s coverage was far from comprehensive, with only about 500 of a planned 1,800 courses available. Students indicated two ways of influence: first, by “illustrating unique aspects of the MIT community/ culture” (30.5%), and because they found the mission of OCW inspiring and wanted to attend a school that would undertake such a project (not a preselected answer, but the overwhelming majority of “other” free-text responses, 33.5%).

Subsequent surveys continue to demonstrate a 25-35% rate of influence among freshmen aware of the site prior to choosing the school they would attend. In 2009, all undergraduates were asked if the site influenced their decision to come to MIT, and, if so, to indicate how. More than 26% overall indicated the site influenced their choice to attend the Institute, and their responses, which track the changing influence of the site over time, provide interesting insight. The senior class in 2009 entered MIT in 2005, when the site contained only roughly half of the 1,800 planned courses; by 2006, when 2009 juniors entered, the site contained about 1,200 courses; by 2007, when 2009 sophomores entered, the site contained 1,550; and by 2008, when 2009 freshmen would have been looking at the site, the site contained the full 1,800 courses planned. Ways the site influenced attendance, broken out by class, are presented in Table 5.

**Table 5**

*In What Way(s) did the OCW Site Influence your Decision to Attend MIT? (Check All that Apply)*

	Freshman	Sophomore	Junior	Senior	All
demonstrated quality of teaching materials used at MIT	48.3%	43.6%	42.7%	33.3%	<b>44.1%</b>
provided insight into teaching approaches at MIT	38.3%	36.2%	35.9%	21.2%	<b>35.3%</b>
provided insight into programs at MIT	34.3%	32.4%	35.0%	31.8%	<b>33.6%</b>
illustrated unique aspects of the MIT community/culture	29.6%	30.9%	27.2%	36.4%	<b>30.3%</b>
highlighted the work of particular professors of interest to you	15.2%	13.8%	10.7%	12.1%	<b>13.6%</b>
other	6.1%	9.6%	2.9%	7.6%	<b>6.8%</b>

As the number of courses present on the site increases, the influence of the site in generally presenting unique aspects of the MIT community/culture diminishes, from 36% for seniors to 30% for freshmen; whereas, types of influence more directly linked to specific content (“demonstrated quality of teaching materials” and “provided insight into teaching approaches”) increase, from 33% to 48% and from 21% to 38% respectively. This would suggest that while some of the recruitment benefits of OCW can be accomplished with a relatively limited set of courses, additional benefits accrue as coverage of curriculum increases.

**JHSPH.**

Data collected by Johns Hopkins Bloomberg School of Public Health provide some support to the overall conclusion of influence, albeit slight, of OCW publication on student enrollment at the publishing institution. Surveys sent to new JHSPH students in 2006-2008 and to all students in 2010-2011 indicate that JHSPH OCW influenced 6.9% of respond-

ing students in their decision to attend JHSPH. When students who were unaware of JHSPH OCW prior to receiving the survey are excluded from the analysis, the percentage of responding students who report being influenced by OCW climbs to at least 11.8%. The percentage could be higher depending on how many students became aware of OCW in the interval between making their enrollment decision and receiving the survey.

After students make their initial institutional enrollment decision, they also face an ongoing series of course enrollment decisions. JHSPH data indicate that OCW publication has a greater influence on these course-level decisions, with some students reporting that their academic planning has been influenced by OCW. Survey results collected in 2010 and 2011 indicate that 31.2% of students who reported being aware of OCW also reported that they used it during their course selection process. When these students were asked if the use of OCW during course selection influenced their decision to enroll in a particular course, 69.9% responded in the affirmative. Furthermore, 35.1% of students who used OCW during course selection also reported that it influenced their decision to not enroll in a particular course.

### **OUNL.**

As mentioned before, at OUNL the OpenER site's influence on the enrollment decisions of students is about 9%, with a total of 24 courses available. This outcome is more or less supported by the results of the survey among the voluntarily registered visitors of the OpenER site. Forty-two percent of the people returning the survey reported they applied for a formal study program or they had bought a course. It is not clear, however, whether this was already the case before visiting the OpenER site.

Note that because most of these surveys investigating influence on school choice were only sent to enrolled students, little information was gathered on site visitors who might have been influenced to *not* attend the publishing university, a possible outcome of viewing the materials as well. In Table 2, 4% of respondents to OUNL surveys indicate that visiting the OpenER site did influence them to decide not to study more formally, so some evidence of this outcome exists.

## **Online Program Enrollment**

Despite indications that OCW publication can provide significant advantages in student recruitment, universities offering online programs have been understandably concerned that the open publication of materials similar to those they are using in for-credit and for-fee distance learning would undercut enrollment. MIT does not offer distance learning programs, but Johns Hopkins Bloomberg School of Public Health does, and data collected by this program indicates that OCW publication has no apparent negative effect on distance learning enrollment.

Between 2005 and 2011, JHSPH OCW published materials from 24 of its for-credit online distance learning courses. To judge whether addition of materials to OCW influenced for-credit enrollment in the subset of online courses

es with materials on OCW, JHSPH staff compared enrollment figures from immediately before and immediately after the addition of each of these 24 courses.

The average percentage change in enrollment across all 24 courses was +10.68%. There was no enrollment change at all in 3 courses, 11 courses experienced enrollment growth, and 10 courses experienced decline. Overall the change in course enrollment was not statistically significant (Wilcoxon signed-rank test,  $P > 0.05$ ).

To account for annual fluctuations in course enrollment, JHSPH staff adjusted the post-OCW enrollment for each course by the average enrollment change experienced across all online JHSPH courses during the corresponding year. After making these adjustments, the overall change in course enrollment was still not statistically significant ( $P > 0.05$ ). Admittedly, this analysis does not account for all of the factors that potentially influence course enrollment in a given academic year. For example, internal factors, such as a special cohort of students entering the school's Master of Public Health (MPH) program, can affect enrollment dramatically. Likewise, external factors, such as the general economic climate, can also influence enrollment decisions. Despite the inability to control for all of these factors, JHSPH staff conclude on the basis of these data that the publication of OCW materials from JHSPH online courses does not influence enrollment in those courses.

Finally, open universities, where the (online) learning materials are generally designed for self-study by "independent learners," are at risk of a possible decline in enrollment because potential students could indeed stick to the "informal learning" mode when the courses are offered as OER. This explains their hesitation to convert their full course base to OER. OUNL has just finished an explorative study into the effects on enrollment of different OER scenarios. We can report here that the results for a representative sample of the Dutch population not being OUNL students indicate that the ultimate (100%) OER scenario would generate a little more (although not statistically significant) expected enrollment than the less radical OER scenarios (Janssen, Schuwer, & Mulder, 2012). This outcome may be considered a surprise, but at the same time it is relevant and encouraging because it gives ground to abandon the so far well-understood reserve among open universities with respect to a full OER approach.

## Return on Institutional Investment

Open educational resources efforts are undertaken at institutions for a wide variety of reasons, generally most directly related to fulfilling the core mission of higher education to create and disseminate knowledge, but also to build awareness of and goodwill toward publishing institutions, as well as to foster improvements in teaching and learning effectiveness. Improving student recruitment is a documented benefit but not the only measure of return on institutional investment. That said, even a rough analysis of the return on investment at both JHSPH and OUNL indicates that the benefits likely far outweigh the costs, even when considering only the narrow question of student recruitment. However, MIT, due to its student recruitment approach, does not have a clear method of estimating return on investment from student recruitment.

### **MIT.**

MIT accepts a limited number of students each year, and so MIT OpenCourseWare does not act to increase the number of students attending and paying tuition. Based on the data presented above, it appears that MIT OpenCourseWare helps to increase the quality of incoming students by making the Institute more competitive against peer institutions, but there is no clear way to measure the monetary impact of such an influence.

### **JHSPH.**

The total cost of operating JHSPH OCW is low (managed by 0.5 FTE or half time of a staff member). Very modest recruitment impacts would offset the operating expenses. In 2011-2012 academic year, 993 new students enrolled at JHSPH. If only a couple of students were attracted to JHSPH because of its OCW, JHSPH would have recovered its annual investment.

### **OUNL.**

As noted above, 9% of OUNL students reported being influenced by OpenER in their decision to buy a regular course. In US dollars, this represents \$1.36 M in tuition revenues attributable at least in part to the site. This would significantly offset the annual cost of operating OpenER, which on the average over the two years of operation plus additional two years of availability of the courses has been around \$201,000. It is, however, not possible to be firm on this because it is not known how many of these students would have enrolled also in the absence of OpenER and how many potential students decided not to buy a regular course because of the free offer through OpenER.

## **Conclusions**

*OCW can be an important tool to increase or widen participation in formal higher education, especially in supporting a return to formal education by lifelong learners.*

Learners access openly available educational resources for informal study in very large numbers, indicating a widespread and pervasive need for continued learning opportunities. A subset of this use is in the context of learners contemplating a return to formal education, and, in this case, OCW appears to serve a number of important purposes, both inspirational and functional. OCW appears to both inspire interest in continued education and help learners develop confidence in their ability to succeed by providing in-depth access to the learning materials they will encounter during formal study. OCW also appears to be a significant aid in selecting programs and courses, preparing for entrance exams, and getting a “head start” on studies.

These effects are significant at the systemic level and should be considered by governments, NGO's, and foundations seeking to increase higher education participation among broad

populations. Especially among populations with many first-generation college students, informal exposure to higher education materials published as OCW may be a useful way for potential students to understand what it means to study at the college level. For situations where increased levels of participation in higher education are explicit goals, such as is the case in the Netherlands (and in many countries), OCW may serve as an important and cost-effective entry to formal higher education.

*OCW can be a significant tool for improving student recruitment.*

OCW projects demonstrate fairly consistent influence on student school choice of between 10-30% of students who have viewed the OCW sites. These figures indicate a clear opportunity for schools to improve recruitment through the open publication of learning materials. Because an aspect of OCW's influence appears to be communication of the culture of the publishing school, it's arguable that even if OCW influences potential students to *not* attend a given school, such an outcome may be in the best interests of both the student and the school by contributing to a better match between the two.

It may be the case that MIT, JHSPH, and OUNL enjoy first mover advantages in publishing educational resources openly and student recruitment advantages may become less pronounced as more schools publish open educational resources; conversely, if OER publication is a widely embraced practice, schools choosing not to openly publish their materials may generate suspicion among prospective students. These are issues for further study. Issues of student retention and success were not addressed in the data collection and are also an area for further study.

*OCW does not appear to negatively affect enrollment of online programs from which materials have been openly shared.*

While this is an area for future study, preliminary indications from the JHSPH experience indicate no discernable impact of OCW publication on online course enrollment when the same materials are used in both cases. This may be an outcome specific to the licensure requirements for practice in a field such as public health and may not generalize into other domains where certification is relatively less critical. However, the recently published OUNL study similarly gives support to this third conclusion. As more online programs experiment with OER and OCW approaches, a clearer picture of the relationships should emerge.

## References

- Abelson, H. (2007, May) The creation of OpenCourseWare at MIT. *Journal of Science Education and Technology*.
- Butcher, N., & Hoosen, S. (2012). *Exploring the business case for OER*. Commonwealth of Learning.
- Lane, A. (2012). *Case studies on institutional open approaches: The Open University*. JISC. Retrieved from <http://oro.open.ac.uk/id/eprint/33245>.
- Carson, S. (2005). *Program evaluation findings. MIT OpenCourseWare*. Retrieved from <http://ocw.mit.edu/about/site-statistics/>
- Carson, S. (2003). *Program evaluation. MIT OpenCourseWare* (Unpublished manuscript).
- Janssen, B., Schuwer, R., & Mulder, F. (2012). A business model approach for OER in open universities. In *Conference Proceedings Cambridge 2012: Innovation and Impact - Openly Collaborating to Enhance Education*. Cambridge, UK.
- Mulder, F. (2006). The advancement of lifelong learning through open educational resources in an open and flexible (self)learning context. In *Presentations Dies Natalis 21 september 2006*. Open Universiteit Nederland, Heerlen, The Netherlands. Retrieved from [http://www.ou.nl/Docs/dies%20natalis/Redes\\_Dies\\_2006.pdf](http://www.ou.nl/Docs/dies%20natalis/Redes_Dies_2006.pdf)
- Schuwer, R., & Mulder, F. (2009). OpenER, a Dutch initiative in open educational resources. *Open Learning*, 24(1), 67–76.
- Wiley, D., Hilton III, J.L., Ellington, S., & Hall, T. (2012). A preliminary examination of the cost savings and learning impacts of using open textbooks in middle and high school science classes. *The International Review of Research in Open and Distance Learning*, 13(3).

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## Facebook Groups as LMS: A Case Study



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### Abstract

This paper describes a pilot study in using Facebook as an alternative to a learning management system (LMS). The paper reviews the current research on the use of Facebook in academia and analyzes the differences between a Facebook group and a regular LMS. The paper reports on a precedent-setting attempt to use a Facebook group as a course Web site, serving as a platform for delivering content and maintaining interactions among the students and between the students and the instructor. The paper presents findings from the students' self-assessments and reflections on their experience. The students expressed satisfaction with learning in Facebook and willingness to continue using these groups in future courses.

**Keywords:** Facebook; LMS; learning management system; collaborative learning; e-learning; social media

### Introduction

The use of learning management systems (LMS), such as Blackboard and Moodle, has become common in many universities and colleges all over the world. The role of the LMS is to serve as a platform for course sites and to fulfill three goals: 1) to provide students with digital learning materials, such as articles, presentations, summaries of lessons, and arrange them in a way that reflects the course plan; 2) to employ interactive learning activities with students in the forums, wikis, and other collaborative tools; and 3) to manage the course and the learners, maintaining tests, evaluating the students' learning and achievements, and giving grades online. In 2010, Facebook made it possible to create closed groups that allow asynchronous and synchronous interactions between members. This also allows sharing of information, such as links to Web sites, text documents, pictures, and so on. The Facebook group contains at

least two of the three components of learning management systems, the digital content component and the interaction component, and thus raises the possibility that Facebook could turn into a learning environment and serve as an alternative learning management system. In this article we analyze the potential of Facebook to replace the traditional LMS. We would like to find out whether a Facebook group is an appropriate platform for delivering learning processes and how this environment differs from other LMSs.

## Literature Review

### Learning Management Systems

A learning management system (LMS), also called a virtual learning environment (VLE), is software that enables course sites to be created (Sclater, 2008). These systems are purchased and maintained by the educational institution to provide students with a space for online learning. An LMS is usually a password-protected system which enables the educational institution to open multiple course environments with relative ease. The course environment is typically managed by the instructor (educator). The educator has the authorization to upload content to the site, organize the materials in the educational continuum that reflects the course, open discussion groups, and manage the information uploaded to the newsgroups, including the option to delete inappropriate content from it. The educator can view reports of the users' activities and receive students' work in order to assess it. In many LMSs the system is linked to other administrative systems in the organization, such as the registration system, payments system, and so on. The students' permissions are usually more limited than those of the educator. Students registered for the course can view the content and download it. They can take part in interactive activities that take place in forums and in some cases may also contribute content to specific parts of the site, such as wiki environments or special collaborative repositories defined for this purpose by the course manager. Different learning management systems have different user interfaces and different features. However, they all share three key functions (Morgan, 2003; Coats, James, & Baldwin, 2005).

1. Content management system: Allowing the creation or uploading of a variety of content items, such as texts, presentations, scanned articles, and audio-visual materials. The content management system also enables the material to be organized in a structure planned by the course administrator, creating folders for topics and content.
2. Tools for managing interactions: Different learning management systems allow the instructor to open different forums. Some systems allow the opening of asynchronous spaces for collaboration, such as wikis and blogs, and some can provide synchronous communication using chat and other online conferencing tools.
3. Tools for managing and assessing learners: Some systems provide administrative tools for recording tasks, grades, and feedback. They also provide user reports that support the instructor in measuring the level of the learners' participation and in assessing the students' achievements.

An LMS should accomplish several goals for the learner. Academically, it should provide a space where learning can take place independently as the instructor is not present at the time of learning, and the students must cope with the content and the tasks themselves (Vrasidas, 2004). On the other hand, the LMS should also provide a social space aimed to create interaction between learners (Dillenbourg, Schneider, & Synteta, 2002). The purpose of the interaction is to increase motivation for learning, creating mutual support among students and encouraging constructive learning.

Nevertheless, studies exploring the use of LMSs in higher education show that the use of these systems is usually limited. Their main use is for simplistic models of auto-evaluation using a multiple-choice questionnaire, and they do not incorporate elements of alternative assessment (Coats, James, & Baldwin, 2005). Many professors who use course sites alongside face-to-face classes make only a basic use of them, uploading teaching materials and publishing one-way messaging to students (Nachmias & Ram, 2009; Shamla & Nachmias, 2007). These findings suggest that an LMS does not in itself produce new models of teaching and learning. Only a minority of instructors are using these environments in innovative ways.

Moreover, LMSs are very expensive systems. Even the so-called “free” open source systems require adaptation and ongoing maintenance by skilled technical staff. Another disadvantage of LMSs is the fact that in many institutions the course is deleted from the LMS server some time after the end of a course in order to save storage space. In some cases the learner loses the permission to enter the learning environment as the course ends; thus, access to the course materials is no longer possible. The control of the student over the LMS is limited.

The hierarchical structure of the LMS, as described above, has aroused much criticism among researchers. They argue that the organizing principle behind the LMS is actually the traditional centralized and hierarchical structure, discouraging the wide adoption of LMS's, and thus preventing innovative and cutting edge pedagogy in these environments (Dron, 2006; Selater, 2008).

If the Facebook group could meet the purposes of learning management systems, and if it could overcome some of the disadvantages indicated in the management and operation of learning using these systems, there is a reasonable possibility that a Facebook group could be a real alternative to an LMS.

## Main Differences Between a Facebook Group and a Conventional LMS

A comparison of the characteristics of a Facebook group and the properties of an LMS reveals fundamental differences between the two.

1. **Ownership:** An LMS is managed and controlled by the educational institution, while Facebook groups belong neither to the organization nor to the students. They are allegedly “neutral,” belonging to Facebook. This has its pros and cons. On the one hand,

depending on Facebook is risky in terms of content backup and privacy issues; on the other hand, the environment is free of charge and does not require any maintenance. Moreover, the fact that the course site is not under the ownership of the institution embodies a deep change in attitude towards ownership of knowledge. The knowledge and information uploaded to the course site is no longer exclusively related to the educational institution but is jointly owned by the learners and educators (Mott, 2010).

2. **Login:** Participating in LMS environments requires having a username and password, created by the educational institution that provides the platform. The username and password, in most cases, are exclusive to the institution and force the student to manage another account besides his day-to-day private account. As a Facebook user, joining a Facebook group does not require handling another account; the student uses the same username for leisure and learning. On the other hand, a Facebook profile is required in order to participate in a Facebook group. This may raise objections among learners who are not interested in having a Facebook account.
3. **Creating and sharing content:** An LMS provides powerful tools developed to create and store a vast variety of content, including presentations, videos, and more. A Facebook group is very limited in terms of its ability to upload content. At the time of the pilot study the system did not allow uploading of the word processor, spreadsheet, PPT, and PDF files which are usually used by students and instructors. To overcome this problem it was necessary to develop strategies for integrating content from other Internet platforms, such as Google Docs, with Facebook (Wang, 2011). During 2012 Facebook upgraded the groups interface and added the option of uploading files directly to the group space.
4. **Content management:** The management of content in an LMS is concentrated in the hands of the educator who has the permissions to create, publish, and delete content. The students, in most cases, are allowed to consume the content. In a Facebook group there is a close similarity between the permissions of students and educators. All users can create content, delete content, invite participants to join the group, and so on.
5. **Organizing content:** In an LMS the organization of content is up to the educator. Facebook organization of content is controlled neither by the users nor by the administrator but by the technology in a “dynamic organization” such that newer news feeds are always at the top of the list, as are comments to old feeds that push old feeds to the top. This is perhaps the main weakness of the Facebook groups. The dynamic organization of the environment makes orientation and retrieval of content difficult. On the other hand, this is also its main strength: The dynamic organization produces the engine that generates interaction and encourages active participation.
6. **Relationship between content and interaction:** One striking difference between the LMS and the Facebook group is the relations between the content management elements and the interaction elements. In the conventional LMS there is a separation between the two. The instructor can create a content item (e.g., presentation) or an

interactive item (e.g., forum), but each item stands on its own. In Facebook groups, however, interactions and content are all created through the status bar, so each item, whether it is content or interaction, is automatically added to the wall with the added option of commenting on it or adding “like” to the item. This special design makes interaction inherent in the content. Using Facebook only as a repository is therefore almost impossible with this structure.

7. **Synchronous interaction:** Most traditional learning management systems allow limited synchronous interaction between learners. However for Facebook groups, synchronous interaction is the main mode of communication between users. As stated above, the environment is provided with a special indicator so that whoever visits the Facebook group and is active at a given moment appears as active on his fellow group members’ screens. Group members can communicate synchronously in a private channel and also in the group channel. The possibility of synchronous dialogue enhances the interactivity between the users of Facebook groups, making it a social space rather than just a learning space and indirectly supporting learning in an informal way.
8. **Assessment tools:** The LMS provides the instructor with many different tools to assess learning, ranging from multiple choice questionnaires through activity reports about students’ submissions, tasks, and mark books. A Facebook group does not have most of these capacities. The only tool built into the Facebook group which could be used for assessment is the internal search tool. By typing a name in the search bar, the instructor can create a user activity report. The report separates between the activity of initiating a new status and comments on existing statuses. The report does not include “like” responses. The combined use of a Facebook group with Google Docs may extend, to some degree, the possibilities of submitting written tasks and of using multiple choice questionnaires (forms).

Despite the significant differences between the Facebook group and the traditional LMS, there seems to be grounds for using the Facebook group as an alternative to an LMS. A Facebook group has several distinct advantages over a conventional LMS, as well as some major disadvantages for learners and educators. Using a Facebook group as an LMS challenges the learners and the educators to provide original and creative solutions for learning in this environment. Later in this article we describe a case study where a Facebook group was used as an alternative to an LMS in a graduate course in education at The College for Academic Studies, Or Yehuda, Israel.

## Facebook and its Use in Academia

Social network sites like Facebook have gained tremendous traction recently as a popular online hangout spaces for both youth and adults (Boyd, 2010). Facebook is the most popular social networking site in Israel and all over the world. According to the CheckFacebook site (see [www.checkFacebook.com](http://www.checkFacebook.com)), there were 3.48812 million Israeli Facebook members in August 2011. According to a comScore survey, the penetration rate in Israel among Internet users aged 15+ was 89.8%, placing Israel in second place after the Philippines. Israel leads in the duration of use of Facebook, with users staying on the Facebook site

for about 10.5 hours per month (see [www.comscore.com](http://www.comscore.com)). Like any new web environment, Facebook groups were not developed for learning and teaching purposes. Nevertheless after a while Facebook began to be used in the academic context. The first studies in using Facebook in academia were conducted in order to examine the students' use of social networks in general (Pempek, 2009). More focused studies have examined the students' use of social networks for academic studies. These studies found that social networks are one of the tools used by new students to adjust and meet other students before and during school (Madge et al., 2009). A British study examined the content shared through Facebook by students in college. The research revealed that only 4% of the content posted by students contained material related to their studies. The content related to experiences out of university, the exchange of practical information about the course curriculum, and the sharing of academic information. Facebook was also used as a channel for expressing difficulties in learning so as to gain moral support from friends and for sharing humorous aspects related to the learning experience (Selwyn, 2007).

Other studies have explored the possibility of instructor-student interaction online. One of the problems identified in this context related to the willingness of instructors to be "friends" of their students, thus exposing themselves to the students, and vice versa. The merging of the social with the educational environment is perceived as a violation of privacy in many cases (Abel, 2005; Hewitt & Forte, 2006; Mendez et al., 2009). Research conducted by Mazer et al. (2007) dealt with the effect of the exposure of the personal lives of instructors to their students through Facebook. This study shows that in most cases the increased exposure of the instructor through Facebook helped the students to perceive the instructor as being more human and trustworthy. At the same time, the researchers emphasize that overexposure may be a sensitive matter. Many instructors are not interested in this exposure and prefer not to share their personal lives with the students. Many students too are not interested in this exposure; they prefer a separation between learning space and social space. In light of these findings, it seems that Facebook is not a suitable environment for formal learning activities that require instructor-student interaction (Madge et al., 2009).

With the advent of "groups" on Facebook, which do not require members of the group to be "friends," it became possible to create a "study group" in which students and instructors participate without being "friends." Under these conditions, the possibility of using the Facebook group as an alternative to an LMS becomes relevant. A Facebook group can be created by any Facebook user. The creator of the group can invite other Facebook users to register for the group by forwarding a request to join it. The group administrator (creator) can choose to close the group or to leave it open. In the case of a closed learning group, the information published in the group does not appear on the user's "wall" as do all other activities on Facebook, but is published only among group members on the group wall.

## The Facebook Group Interface

The center of the Facebook group is the wall. Members of the group can share content, statuses (plain text messages), links to Web sites, pictures, and videos on the wall.

Each item uploaded to the wall can get responses, either by indicating "like" or by

writing a more detailed comment. The organization of the information on Facebook is dynamic as new items appear at the top of the list, and old items with new responses are also pushed to the top of the list. The wall is thus always reorganized in such a way that the newest items and the newest comments are always at the top. The Facebook group wall also allows the creation of documents (docs). The docs are part of the items posted on the wall but can also be accessible from a special box on the group page. The documents generator of Facebook is a very simple editor, providing only minimal design of text. Another tool of the Facebook group is the “events” generator. Events are items that are time-dependent and allow the members of the group to “attend” or “not attend.”

The profile pictures of all members of the Facebook group appear on the group page. There is a special sign to indicate those currently on Facebook. Group members can use the one-to-one instant messaging system to talk with each other, as well as group conferencing to chat with the entire group. The group also provides an internal search engine that supports information retrieval from the environment.

An attempt to use a Facebook group as a substitute for an LMS is described in an article by Wang et al. (2011). The authors argue that the Facebook group has the potential to be used as an alternative to an LMS because it contains the pedagogical, social, and technological elements required from an LMS. It allows the sharing of materials and resources and it allows discussions to take place. However, the authors argue that the Facebook environment is still perceived to some extent as an unsafe environment that violates the privacy of the participants. Another study measured the extent of involvement of students in discussions on Facebook compared to a traditional course site. The findings indicated that the number of messages in the discussion that took place on the Facebook group was 400% higher compared to a parallel discussion on the WebCT forum. The authors explain the increase in the volume of activity in Facebook by the fact that “students were already accessing Facebook for personal use and checked in on the group when they accessed Facebook for other reasons” (Schroeder & Greenbowe, 2009).

### Case Study in Using a Facebook Group as an Alternative to an LMS

The course “International Aspects of ICT in Education” was taught in the graduate program in education in the school of Education, The College for Academic Studies in Or Yehuda in the summer semester of 2011. The course is a face-to-face course, with class meetings once a week over 13 weeks. There were 50 students registered for the course, all of them computer literate. The students had opened a Facebook group for social goals before the course. This group was informal and registration was voluntary, not required.

The Facebook learning group was opened at the beginning of the course. The students were required to register for it as part of the course as the course tasks were published in the group and were part of the final grades in the course.

Using the Facebook group included the following components.

1. **Course presentations:** The course presentations were published in the group after class. Publishing the presentations required integration between Facebook and Google Docs. In the first stage the instructor uploaded the presentations to Google Docs and defined them as “accessible to everybody with a link.” The instructor then created a Facebook group, *Doc*, and added a link to the presentations. The reason for creating a Doc group and not just publishing a link on the wall was the desire to ease the accessibility to the content created by the instructor and differentiate it from other posts. Once the presentations were published, they were also accessible from the wall and everybody could respond to them and download them.
2. **Performing tasks:** The activity in the Facebook group consisted of five tasks, including searching, collecting information and sharing it with colleagues, peer assessment, online discussions, and quantitative and reflective self-assessment. The tasks also incorporated Google Docs. Students were asked to fill out forms prepared in Google Docs. After completing the forms, the database that was created as a joint task was published back on Facebook and analyzed by the students.
3. **Questions and requests for the instructor:** The Facebook group was also used as a means of communication between the students and the instructor. The students could choose either the personal channel (mail) of communication or the public channel (writing on the group wall). The students generally preferred to publish their questions on the wall.

## Methodology

After completing the activities, the students performed a summative assessment task. In this task, the students were asked to reflect on their activities in the Facebook group and to report on the difficulties which had occurred during learning. The information was gathered into a Google Docs form for the researchers to analyze.

Content analysis of the responses from the reflections was carried out in two stages. Initially, recurring themes were identified by all three researchers and a list of the main themes was created based on agreement between the judges. In the second phase, one researcher coded all the statements. Review of encodings was by another researcher. The level of reliability between judges was over 85%.

## Students' Assessment of the Facebook Group Activities

Analysis shows that the students experienced the learning in Facebook as contributing in three regards: interaction with their colleagues, communication with the instructor, and correlation with their personal learning style. A fourth theme was also reported, expressing intensity and immediacy as a major experience at all three levels.

Table 1  
 Main Themes (N = 43)

Level	Theme	Frequency
Interaction with colleagues	Collaborative learning	32%
	Mutual support	23%
	Group consolidation	20%
Interaction with the instructor	Task fulfillment	53%
	Support in learning	16%
Personal learning	Initiative behavior	11%
	Reactive behavior	25%
	Self-expression	18%
	Passive presence	13%
	<b>Intensity</b>	<b>25%</b>

**Interaction with colleagues.**

Of the 43 students who responded to the questionnaire (86% response rate), 32% highlighted collaborative learning as their main experience. An example can be found in the following statement:

The messages and responses have been the most enjoyable part of the conversation in the group. The issues were raised not by the instructor but by the students, who wished to respond and share. In some cases, a deep discussion was developed and encouraged many friends to make interesting comments (like the discussion opened by Arthur on whether to permit young children to go into Facebook ). I really enjoyed taking part in these conversations. In my opinion, this is the real contribution of the Facebook environment for learning in this course.

The importance of the Facebook group as a joint space for class consolidation was emphasized by 23% of the students, as evidenced by the following comment: “We have been exposed to a variety of opinions and learning materials. An instant connection was created between everyone. I feel that the environment contributed to the consolidation of the group.” Twenty percent of the students referred to the advantage of having a place in which the

students could mutually assist each other either technically or academically; for example, “In addition, I took advantage of accessibility to all the students for giving and receiving mutual aid regarding issues taught in the course.

### **Interaction with the instructor.**

The Facebook group activities were seen by 53% of the students as part of the course requirements, and their work was aimed at fulfilling the tasks.

The advantage of the environment for gaining assistance and clarification in the learning process was emphasized by 16% of the students. It seems that there is a correlation between these themes and the overall activity level of students. Students whose activity was minimal are the ones who only work to fulfill their obligations, as expressed in the following quotation: “I would summarize my activity on Facebook as doing just what I had to and nothing more.”

On the other hand, the more active students emphasized the advantage of having an interaction with the instructor beyond the particular tasks, as evidenced by the following comment:

The environment has allowed a direct link between the students and the instructor. She became an advisor, she gave us the tools and exposed us to information sources and learning tools, and gave us immediate feedback. This is meaningful learning for me.

### **Personal learning.**

The students experienced the effects of the Facebook environment on their learning in different ways related to their personal learning style and their characteristics. Eleven percent of the students described their activities as initiating and proactive, while 25% described them as reactive. An example of a reactive style is shown in the following statement: “I didn’t initiate new statuses and this is my weakness in this type of learning. But every time I had to respond or perform a task, I followed the instructions in their entirety.” The proactive style is shown in the following quote: “There were messages I initiated on my own, because of an issue arising from the course material that I wanted to share with my friends and stimulate discussion.”

Another distinction reflected in the findings is between students who experienced this space as enhancing self-expression (18%) and students who described a more passive way of participation (13%), meaning reading and following-up or pressing “like.” For the passive student, using “like” was a way of allowing them effectively to show an active presence in the environment without having to express themselves in more detail. This is expressed in the following quotation:

My reaction to the members of the group was “like,” which for me is also a kind of a response that supports the teammates. I liked it (literally) when friends did it to me, and I felt that what I wrote to them is significant for them and for the discussion.

### **Intensity.**

Twenty-five percent of the students repeatedly emphasized that the online learning experience was intense, immediate, and fast. One of the students even defined the experience as “catchy:” “There is something ‘catchy’ in the responses and therefore we see more comments.” An example of the experience of immediacy and intensity at all levels can be found here:

We created an instant connection between us all. I feel that the environment contributed to the consolidation of the group, direct contact with the participants and of course, a place to “hear” all of them on any subject that came up. The ability to speak up immediately was very convenient and suited me very much. I used it in many cases. Rapid response of all the classmates gave a sense of a real “conversation” and made me continue responding and expressing agreement or disagreement, with the need to justify why.

## **Students’ Difficulties During the Course**

The second question that the students answered related to the difficulties they faced during the course. Of the 43 students, 34% reported that they had no difficulties at all. The difficulties commonly faced by the students were 1) difficulty in locating old items and orientation problems (39%); 2) workload (27%); 3) uncomfortable blurring of the boundaries between social space and student space (4%); and 4) difficulty in expressing oneself in writing and in participating (4%).

### **Difficulty in locating items and in orientation.**

The dynamic structure of Facebook content was a serious problem for students who found it difficult to locate important information they wanted to retrieve during learning. The solution found is that most important items (presentations, assignments, etc.) were created in the DOCs section of the existing Facebook group. The DOCs are easier to access because there is a special place for them on the sidebar. It seems that this solution eased orientation, as evidenced by the following quotation: “The difficulty in the beginning was to find the materials and the tasks, until they were transferred to the sidebar and concentrated there and that solved the problem.” The students also learned to use the existing internal search provided in the group as another retrieval tool.

### **Workload.**

The intensity of learning was experienced by some students as a heavy burden, as expressed in the following comment: “The main difficulty involved in the Facebook group was the need to stay informed at all times. Messages frequently changed and to understand the mindset I had to enter the group every day. That required a commitment that I haven’t experienced in most other courses.”

### **Uncomfortable blurring of the boundaries between the social and the academic arenas.**

Although the group was closed and did not require exposure of the personal profile, some students still felt some discomfort in the fact that Facebook is considered a social environment yet also serves as a learning environment, as shown in the following statement: “Facebook is a place where I talk with and update my closest friends and relatives. I go there to get away from the routine (cleaning up, cooking and studying), and with the existence of the group it was hard to make the separation.”

### **Difficulty in expressing oneself in writing.**

We mentioned above the relationship between the learning style of the students and how they experienced the learning environment. We have seen that there is a substantial difference between initiating and reacting, proactive and passive. It seems that for some students the reason for passivity is their difficulty in expressing themselves in writing and in public, as expressed, for example, in the following quote:

There were many cases where I wrote responses but didn’t publish them. The idea of the exposure of my words, kept there forever in black and white, deterred me for some reason (maybe there’s a psychological reason). Anyway, I’m disappointed that my participation was so low.

In conclusion, the students were asked to indicate, on a scale of 1-5, the extent to which the Facebook group contributed to their learning on the course. The average score was 4.1. For the question “Would you recommend using this form of Facebook group on other academic courses?” 86% of the students answered ‘yes’ and 14% answered ‘no.’

## **Discussion and Conclusions**

The student’s reflection on their learning with a Facebook group indicates that learning in this environment is perceived as very intensive and collaborative in nature. The students emphasized the importance of the environment in evoking mutual support and social consolidation, factors that support collaborative learning processes. Unlike traditional LMSs which are mainly used at the trivial content-based level, the learning Facebook group is perceived as a dynamic learning environment.

An interesting finding emerged from the research which is the student's perception of the Facebook group as a stimulator of participation, both proactive or reactive. Students felt that Facebook encouraged them to express themselves. Even passive students had the ability to express their presence on the Facebook group by indicating "like" on chosen posts.

These unique characteristics of the Facebook group brings us to the conclusion that the Facebook group is not just an alternative to LMS (Wang, 2011) but have some major advantages over traditional LMSs in promoting collaborative and active learning.

The advantages of the Facebook group are also its disadvantages. The intensive dynamic of the group activity is perceived by some students as a load, weighing on students' daily routine. This dynamic comes largely at the expense of organization and orientation in the learning space. Intelligent use of existing tools and groups for information organization (docs and search tools) significantly improves the problem of orientation.

## Summary

The case study described above demonstrates that design and operation of a learning activity within a Facebook group produces a very intensive and collaborative learning process. The reason for that must lie in the unique dynamic structure and special features that differentiate it from other learning management systems. The group is designed in a way that encourages participation and interaction on every single post uploaded to the group; therefore, it can be leveraged to carry out learning processes that require interactivity between learners and between learners and the instructor. The Facebook group is not just "another discussion group" but a unique environment that can serve as an interesting alternative to elaborate collaborative learning processes.

Nevertheless, we must remember that the environment itself is not solely responsible for the creation of learning dynamics (Dillenbourg, Schneider, & Synteta, 2002). The role of the instructor in designing the tasks, the speed and quality of her responses during the tasks, the motivation of learners and the fact that the Facebook activity was a large part of the requirements of the course and part of the final grade all contributed to the success of the activity and the dynamics that were developed. Continuing research that compares this environment in other study groups, and with different models of teaching, could contribute to the understanding of the influence of Facebook groups as a learning environment.

## References

- Abel, M. (2005). Find me on Facebook . . . as long as you are not a faculty member or administrator. *Resource for College Transitions*, 3(3), 1-12.
- Boyd, D. (2010). Social network sites as networked publics: Affordances, dynamics, and implications. In P. A. Zizi (Ed.), *Networked self: Identity, community, and culture on social network sites* (pp. 39-58). Retrieved from <http://www.danah.org/papers/2010/SNSasNetworkedPublics.pdf>
- Cheung, C. M. K., Chiu, P., & Lee, M. K. O. (2011). Online social networks: Why do students use Facebook? *Computers in Human Behavior*, 27(4), 1337-1343.
- Coats, H.J.R., & Baldwin, G. (2005) A critical examination of the effects of learning management systems on university teaching and learning. *Tertiary Education and Management*, 11(1), 19-36.
- Dillenbourg, P., Schneider, D., & Synteta, P. (2002). Virtual learning environments. In A. Dimitracopoulou (Ed.), *Proceedings of the 3rd Hellenic conference on information and communication technologies in education* (pp. 3–18). Greece: Kastaniotis Editions.
- Dron, J. (2006). *Any color you like, as long as it's Blackboard*. Paper presented at the World Conference on E-Learning in Corporate, Government, Healthcare and Higher Education, Honolulu, Hawaii, USA.
- Furkush-Baruch, A., & Heshkovitz, A. (2011). The use of social networks by higher education institutes in Israel. Y. Eshet-Alkalai, A. Caspi, S. Eden, N. Geri, Y. Yair (Eds.) *Proceedings of the Chais Conference on Instructional Technologies Research 2011: Learning in the Technological Era*. Raanana: The Open University of Israel.
- Grosbeck, G., Bran R., & Tiru, L. (2011). Dear instructor, what should I write on my wall? A case study on academic uses of Facebook. *Procedia - Social and Behavioral Sciences*, 15, 1425-1430.
- Hew, K. (2011). Students' and instructors' use of Facebook. *Computers in Human Behavior*, 27, 662–676. Retrieved from <http://portal.acm.org/citation.cfm?id=1937203.1937626>
- Madge, M., Meek, J., Wellens, J., & Hooley, T. (2009). Facebook, social integration and informal learning at university: 'It is more for socialising and talking to friends about work than for actually doing work'. *Learning, Media and Technology*, 34(2), 141-155.
- Mazer, J.P., Murphy, R.E., & Simonds, C.J. (2009). The effects of instructor self-disclosure via Facebook on instructor credibility. *Learning, Media and Technology*, 34(2), 175-183.

- Mendez, J. P., Curry, J., Mwavita, M., Kennedy, K., Weinland, K., & Bainbridge, K. (2009). To friend or not to friend: Academic interaction on Facebook. *International Journal of Instructional Technology & Distance Learning*, September.
- Morgan, G. (2003). *Faculty use of course management systems*. Retrieved from <http://www.educause.edu/ir/library/pdf/ers0302/rs/ers0302w.pdf>.
- Mott, J. (2010) Envisioning the post-LMS era: The open learning network. *EDUCAUSE Quarterly Magazine*, 33, 1.
- Nachmias, R., & Ram, J. (2009). Research insights from a decade of campus-wide implementation of web-supported academic instruction at Tel Aviv University. *The International Review of Research in Open and Distance Learning*, 10(2), 1-15.
- Pempek, T. A., Yermolayeva, Y. A., & Calvert S. L. (2009). College students' social networking experiences on Facebook. *Journal of Applied Developmental Psychology*, 30, 227-238. Retrieved from <http://www.educause.edu/EDUCAUSE+Quarterly/EDUCAUSEQuarterlyMagazineVolum/EnvisioningthePostLMSEraTheOpe/199389>
- Roblyer, M. D., McDaniel, M., Webb, M., Herman, J., & Witty, J. V. (2010). Findings on Facebook in higher education: A comparison of college faculty and student uses and perceptions of social networking sites. *Internet and Higher Education*, 13(3), 134-140.
- Schroeder, J., & Greenbowe, T.J. (2009). The chemistry of Facebook: Using social networking to create an online community for the organic chemistry laboratory. *Innovate: Journal of Online Education*, 5(4). Retrieved from <http://www.innovateonline.info/print.php?view=pdf&id=625>
- Slater, N. (2008). Web 2.0, personal learning environments, and the future of learning management systems. *EDUCAUSE Research Bulletin*, 13. Boulder, CO: EDUCAUSE Center for Applied research.
- Selwyn (2007). *Screw Blackboard... do it on Facebook!': An investigation of students' educational use of Facebook*. Paper presented to the 'Poke 1.0 - Facebook social research symposium', University of London.
- Selwyn, N. (2009). Faceworking: Exploring students' education-related use of Facebook. *Learning, Media and Technology*, 34(2), 157-174.
- Shemla, A., & Nachmias, R. (2007). Current state of web-supported courses at Tel-Aviv University. *International Journal of E-Learning*, 6(2), 235-246.
- Vrasidas, C. (2004). Issues of pedagogy and design in e-learning systems. *Communications of ACM*. Retrieved from <http://portal.acm.org.ezproxy.massey.ac.nz/citation.cfm?id=968086&coll=portal&dl=ACM&CFID=32263271&CFTOKEN=96032385>

Vovides, Y., Sanchez-Alonso, S., Mitropoulou, V., & Nickmans, G. ( 2007). The use of e-learning course management systems to support learning strategies and to improve self-regulated learning. *Educational Research Review*, 2(1), 64-74.

Wang, Q., Woo, H. L., Quek, C. L., Yang, Y., & Liu, M. (2011). Using the Facebook group as learning management system: An exploratory study. *British Journal of Educational Technology*. doi: 10.1111/j.1467-8535.2011.01195.x

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## Footprints of Emergence



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### Abstract

It is ironic that the management of education has become more closed while learning has become more open, particularly over the past 10-20 years. The curriculum has become more instrumental, predictive, standardized, and micro-managed in the belief that this supports employability as well as the management of educational processes, resources, and value. Meanwhile, people have embraced interactive, participatory, collaborative, and innovative networks for living and learning. To respond to these challenges, we need to develop *practical tools to help us describe these new forms of learning* which are multivariate, self-organised, complex, adaptive, and unpredictable. We draw on complexity theory and our experience as researchers, designers, and participants in open and interactive learning to go beyond conventional approaches. We develop a 3D model of landscapes of learning for exploring the relationship between prescribed and emergent learning in any given curriculum. We do this by repeatedly testing our descriptive landscapes (or footprints) against theory, research, and practice across a range of case studies. By doing this, we have not only come up with a practical tool which can be used by curriculum designers, but also realised that the curriculum itself can usefully be treated as emergent, depending on the dynamics between prescribed and emergent learning and how the learning landscape is curated.

**Keywords:** Emergence; prescribed; self-organization; footprints; topographies; curriculum; design; curation; co-evolution

## Introduction

The past five years have seen the blossoming of open, online courses and networked learning. Some courses are freely available on the Web and attract large numbers of participants. Many fee-paying courses have expanded their interaction and networking, using social media (Networked Learning Conference, 2012). What these learning events have in common is that they are increasingly open, interaction is distributed over a wider variety of learning platforms, and they offer learners considerable autonomy and control to create their own personalised, unpredictable, and emergent learning.

Several researchers and practitioners have used aspects of complexity theory to understand these developments (Wenger, White, & Smith 2009; Siemens & Downes 2008, 09; Snowden & Boone, 2007). But with the exception of Snowden, this has been rather selective. We thought it might be useful to develop a theoretical framework for emergent learning that uses complexity theory explicitly and systematically and published a paper in 2011 that attempted to do just that (Williams, Karousou, & Mackness, 2011). It describes emergent learning as follows:

*Emergent learning* is likely to occur when many self-organising agents interact frequently and openly, with considerable degrees of freedom, but within specific constraints; no individual can see the whole picture; and agents and system co-evolve.

... Why is it important? Emergent learning is open and flexible, so it is responsive to context and can adapt rapidly. ...[However] emergence is not a panacea, it is an option ... it has to be integrated within an overall, inclusive learning ecology, along with prescribed learning. (p.45)

In other words, emergent learning is adaptive and, paradoxically, *ordered yet unpredictable*.

This paper builds on the detailed theoretical framework in the 2011 paper and focuses, instead, on developing a set of practical tools (3D footprints) to describe the relationships between emergent learning and prescribed learning and the dynamics of change across learning events within interactive social media and networks. These footprints have also been developed to be used more widely for design, strategy, and organization, that is for broader conversations about a course, for example for evaluation as well as for on-going feed-forward as the course (and even the curriculum) emerges.

In this process we re-examine the relationship between curriculum design and learning in search of adaptive organisational forms that enable emergent learning to flourish. The new curriculum can best be described as a 'topography of learning' (see Figures 2-4), or an 'architecture of participation' (Fred Garnett, 2011, personal communication). An 'emergent curriculum,' rather than being a pre-determined framework for compliance, evolves dy-

namicallly during each iteration of the course (see the EBIN example). Barnett (2007) and Morrison (2007) both emphasise the rich, open opportunities such a curriculum presents, but also emphasise that these may be spaces of uncertainty, anxiety, and risk in which the students need to have the courage to be open to new experiences (Barnett, 2007, p.157).

## Footprints of Emergence

### Developing the Emergent/Prescriptive Learning Framework

Our 2011 paper outlined the differences between prescribed and emergent learning. Here we move on and recast these binary oppositions, instead, as overarching factors that apply across a spectrum to *both* prescribed and emergent learning, just in different ways, for example *organization*, from self-organization (emergent) to institutional organization (prescribed) (Table 2 in Appendix A).

We start with the description of a course as it was designed and presented. We are aware of the pitfalls of speculating about the intentions of the designer, so we restrict ourselves to what we know about what was actually offered. Where we have enough information, we map out the subsequent phases in the course, how the dynamics change and, crucially, whether ‘agency and structure co-evolve’ or, more simply, whether there is mutual adaptation and growth between the participants and the organisation of the event.

The factors that we use, such as *self-organization*, *risk* and *trust*, have a direct bearing on learning – but we cannot emphasise enough that *each of these factors may enable or inhibit learning* depending on the context – the dynamics of the situation, and the purpose of the event. None of the factors are sufficient on their own to ensure learning and, besides, to the extent that emergent learning is open and self-organised, it is always somewhat unpredictable, and in some cases the descriptions focus on how learning did *not* happen, when things become too risky, too close to the edge of chaos, or too prescriptive for that matter.

Every factor has an up-side and a down-side or even a dark-side. Higher education, for example, often involves ‘identity workshops’ (Turkle, 2012), which can be too high-risk for comfort. Barnett’s spaces of uncertainty (above) can be empowering, but they can also cause anxiety. Courses that encourage students to explore their own personal narratives, for instance, can provide fascinating opportunities to explore their identities, but if not sensitively handled, they can be seriously alienating (see Williams, Karousou, & Mallia, 2011 on the use of biographies).

In this paper we focus on just two things: 1) to determine which factors are most relevant to emergent learning and prescribed learning and the way these interact in practice; and 2) to describe the dynamics of the processes of self/organization, mapped out in three dimensional *topographies of learning* (Figures 2 and 4). Current terminology (e.g., VLEs or virtual learning environments) has a strong undertow of linearity and predictability. This is no longer fit for purpose to describe what Reilly (2012), for instance, talks about when

she describes

*pointillist* learning [which is] the act of folding space. No longer must we progress from point A to B ... making each learner follow an identical [linear] path. Pointillist learning allows learners to determine points and fold/unfold/refold conceptual space at will. Prediction is pointless as these types of acts ... occur in non-orientable time.

We align ourselves with theories of learning and knowledge which emphasise the role of embodied learning and knowing, multi-modal learning, and, more pertinently, cross-modal (or *synaesthetic*) learning, in which experience, physical engagement, and traditional cognition *all* play an integral part (Gumtau, 2011; Williams, Gumtau, & Mackness, 2012). Consequently we use metaphor, and particularly visual metaphor, not as an illustrative aside but as a core mode of thinking and researching. The *topography of learning* is in one sense a mountain landscape, but it links to other 'topographies' too, like curved space-time (Figure 3). However, none of these metaphors is a 'magic bullet.' This paper must be judged on its clarity and its ability to engage the mind (and more so the practices) of the reader, not on the metaphor count per page.

## Footprints and Topographies

### Factors

Our approach has developed through three phases. First, we tested and applied concepts which emerged from practice, participation, and research (outlined in detail in our previous paper in 2011) to our case studies to identify 25 pertinent factors. We put these factors into traditional 2D footprints, such as the 'radar' graphs in Excel (Figure 1).

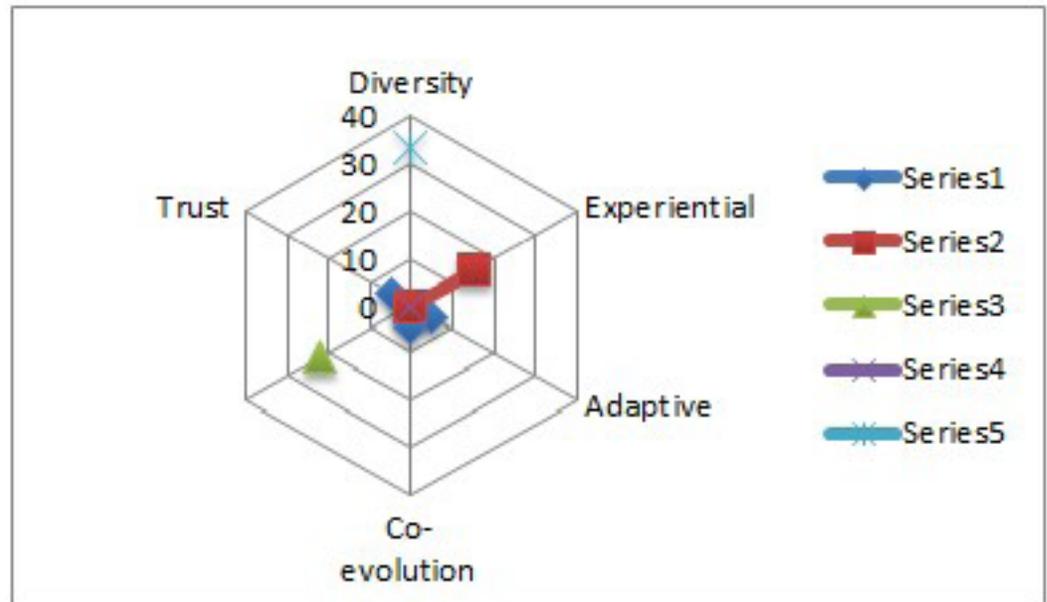


Figure 1. Radar graphs.

## Clusters

We then grouped the factors into four clusters (Table 1) drawing on key elements of complexity theory, specifically the co-evolution of structure and agency (Cilliers 2005; Snowden & Boone, 2007). The clusters are *open/structure*, the extent to which the overall structure of the learning 'scape is open or predetermined; *interactive environment*, the way openness and structure is realised in an actual event; *agency*, the overall extent to which agency, initiative, and identity are active elements of the learning process; and *presence/writing*, the way in which people present and articulate themselves and their thoughts and feelings across a wide range of media, from the immediate presence of conversation and interaction to studied, formal modes of writing.

Table 1

*Clusters and Factors*

Clusters			
1. Open / structure	2. Interactive environment	3. Agency	4. Presence / writing
Factors	Factors	Factors	Factors
Risk	Diversity	Cross-modal, multi-modal	Solitude and contemplation
Liminal space	Experiential	Open affordances	Casual encounters / conversations
Ambiguity	Adaptive	Self-organisation	Networks encounters, engagement
Unpredictable outcomes	Co-evolution	Autonomy	Hybrids, informal/ ante-formal
Disruption	Frequent interaction and networking	Negotiated outcomes	In/formal writing and inscriptions
Self-correction	Trust	Identity	
Multipath	Theory of mind		

This arrangement of the factors in clusters gives coherence to the holistic picture of the learning ‘scape and foregrounds the affordances of emergent learning. From someone else’s perspective, and in another context, different factors and even different topologies might be more appropriate.

### 3D Topography

In the conventional ‘radar’ footprint (Figure 1), each factor is placed on a spoke going outwards from the centre. The middle of the footprint indicates none of a particular factor, which increases outwards, with more equals high value and less equals low value. This would be a rather simplistic way to describe complexity.

Reflecting on the need to integrate prescribed and emergent learning, we realised that more of anything, even emergence, is not always a good thing. And we wanted to map out and describe the *appropriate balance* between prescribed and emergent learning for particular contexts, not to construct a normative and evaluative framework. So we reconfigured the footprint by replacing the vectors of a conventional (*zero to max.*) ‘radar graphs’ with factors which still vary across a spectrum, but in which there is value *at both the centre and the periphery* of the footprint. These range, for example, as follows: risk, *high risk /to/*

*safe-to-fail /to/ fail-safe* and disruption, *displacing, inverting, challenging /to/ affirming, consolidating, protecting* (see Table 2 in Appendix A for more details).

The centre and periphery of the footprints just deliver different kinds of value: emergence (towards the periphery) and prescription (towards the centre). The *risk* factor, for instance, is not about more or less risk, but rather about the *different functions* of risk, and the way it can be configured to enhance either emergent or prescribed learning, depending on the learning and the context. So it varies from *high risk* at the ‘edge’ of emergence (where the boundaries of learning and creativity are tested) to *safe-to-fail* in the middle of the emergent zone (where mistakes can be part of learning) to *fail-safe* in the prescribed zone (where failure is not tolerated and could even be dangerous).

These new *dual-value vectors* now have positive value at *both* ends, which means that the new *topographical footprint* can’t be read as a conventional footprint at all. These new vectors are scored and mapped out across the underlying topography (Figures 2-4) which becomes a 3D graphic ‘scaffold’ for describing, discussing, and organising the learning ‘scapes’. The scoring method is outlined and demonstrated, with an example, in Appendix B.

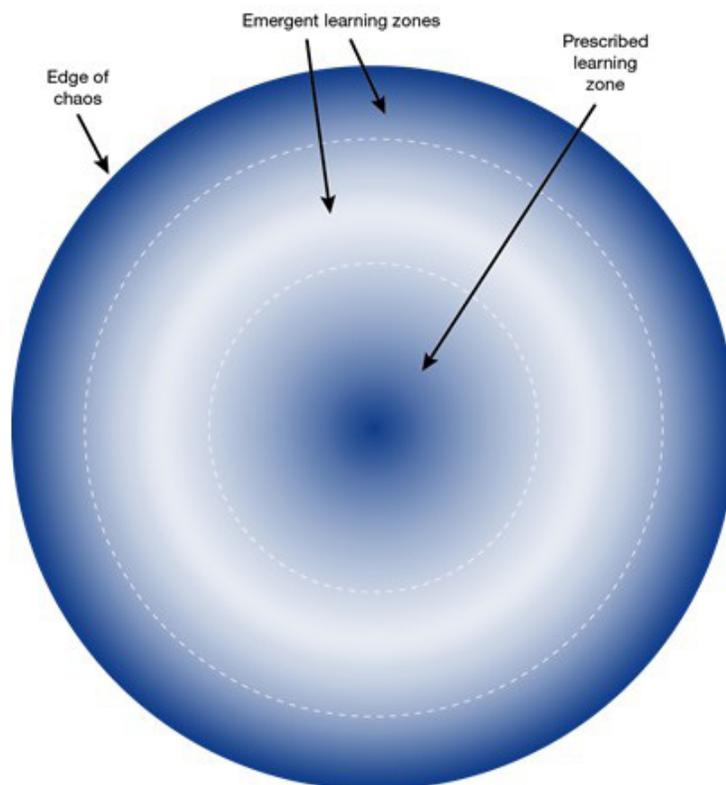


Figure 2. Topographical footprint – top view.

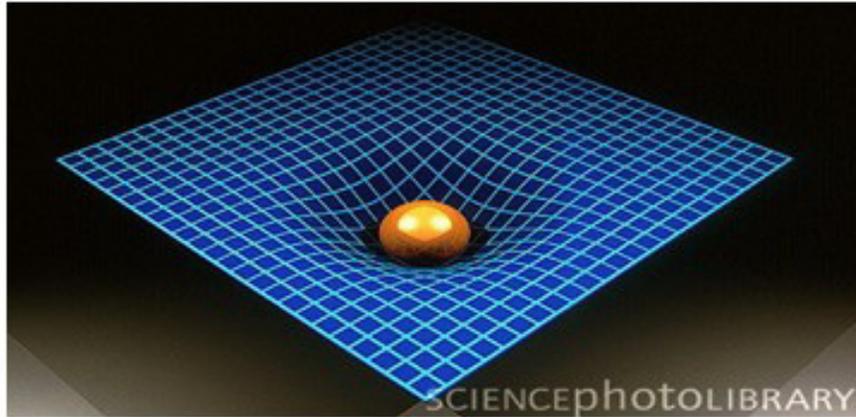


Figure 3. Curved space topography.

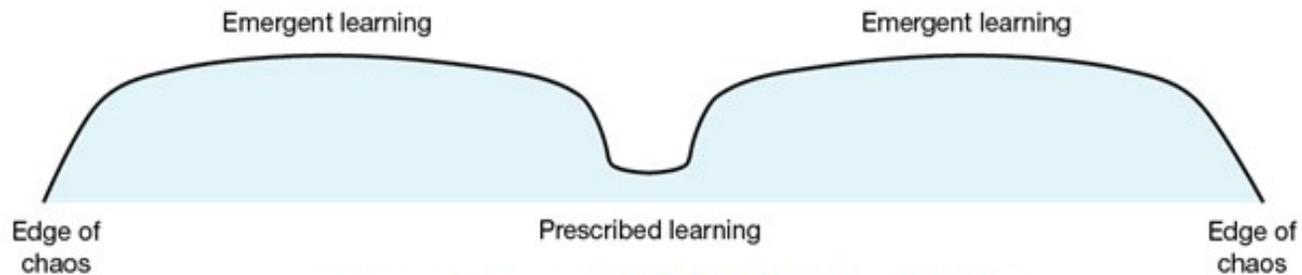


Figure 4. Topographical footprint – cross section view.

Figure 2 is a top-view of the footprint, which in perspective would look similar to the curved-space topography in Figure 3 (without the sphere of course). Figure 4 shows the topographical footprint in transverse section, or side view.

## Zones

The 3D dynamics of the topography map out the different zones: prescribed, emergent, and chaotic, the relationships between them, and the dynamics, risks, and opportunities that are involved in moving between zones as learners choose to shift between zones or are requested to do so.

The 3D topography consists of a central (dark blue) zone of *prescribed learning* in which learning is low risk, stable, and organised *for* the learner rather than *by* the learner. In the topographical metaphor, this is a valley, a settlement, for *reified* (stable, established) knowledge. It is surrounded by a steep incline, indicating the inertia of formalised knowledge that makes this central zone *difficult to climb out of*, on the one hand, but safe and comfortable to ‘reside’ in on the other.

The top of the ridge or plateau is the second circle: the optimal zone for emergence, which

we call the 'sweet zone,' which is off-white. It is open, inviting, ambiguous, full of possibilities, yet reasonably flat and reassuring. Around that is a further area of emergence (the third circle in a darker blue), which is increasingly higher risk, and possibly more creative, which we call 'sour' or 'sharp' emergence, depending on whether the emergence is challenging in a positive sense (sharp) or in a negative, unsettling sense (sour). Here the topography drops off sharply towards the 'edge of chaos,' where learners may *fall over the cliff*, get *lost in social space*, *ensnared in the tyranny of participation*, or just plain panicked. It's where emergence, interaction, and openness becomes just too much to cope with, quite counter-productive and disorientating.

The topologies of learning are not primarily concerned with the actual content of the learning. Rather, we are trying to describe *the ways in which a learning 'scape is organised and experienced, dynamically*, for a particular context and particular learners and whether the learning 'scape is appropriate for that context, *on its own terms*. Knowledge gained about emergence may provide retrospective coherence, and even a bit of wisdom, but it does not produce predictability.

## Palettes

We deliberately create the footprints in a palette (Figure 5) to indicate that not all the factors apply to all the case studies. In each case we just use the factors that are appropriate, though the ones that are left behind can be as significant.

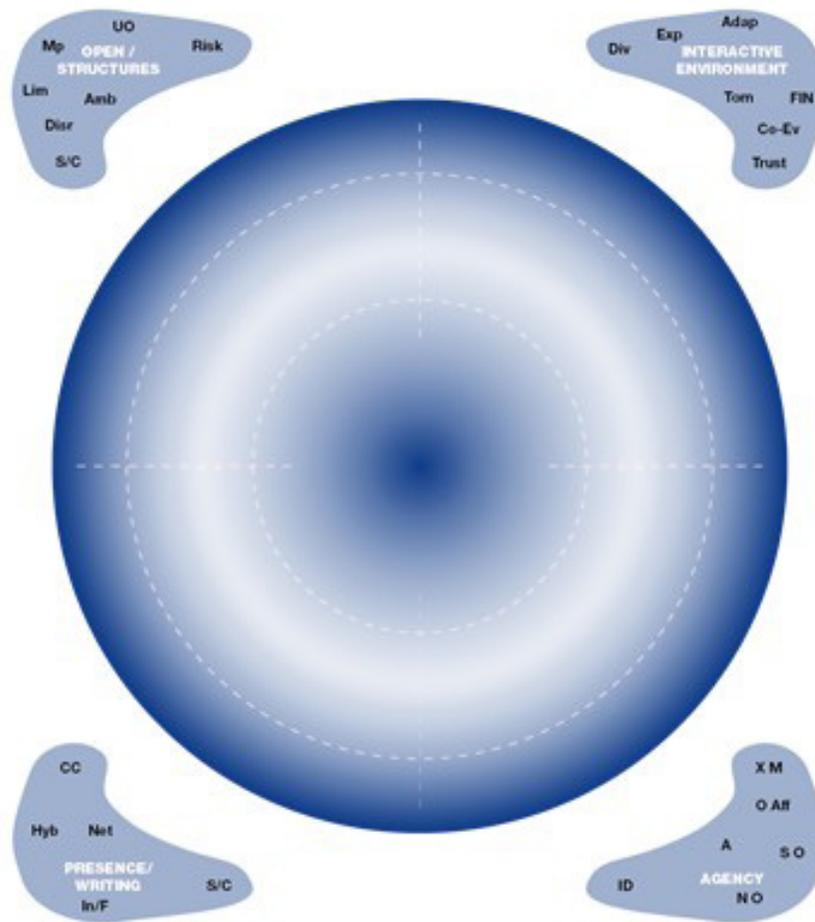


Figure 5. Palette.

When we describe a new case, we might need to add new factors to our palette just as you create and add new colours for painting. We are aware that the boundary between visual description and visual analysis is fuzzy and that creating a taxonomy is always a selective semiotic: it cuts some things in and cuts some things out. Perception and description is never innocent. Nevertheless, we try to stick to *empirical, rich, graphic descriptions* as far as possible.

Our palette is thus flexible and adaptive, and we use this approach to align our research with our subject matter to explore and demonstrate, graphically, what co-evolution and en-active perception means within the practice of researching. There is an onus on the reader to creatively engage with these visual descriptions.

## Case Studies

The four case studies are presented here in top view only. Colour indicates the variations in depth and height across the 3D topography (Figures 2 & 4). The four quadrants and the

three concentric 'zones' are clearly indicated in Figure 5, but they have been faded slightly into the background in the other footprint diagrams, to emphasise the footprint shapes. The method for 'scoring' the factors in the footprints is detailed in Appendix B.

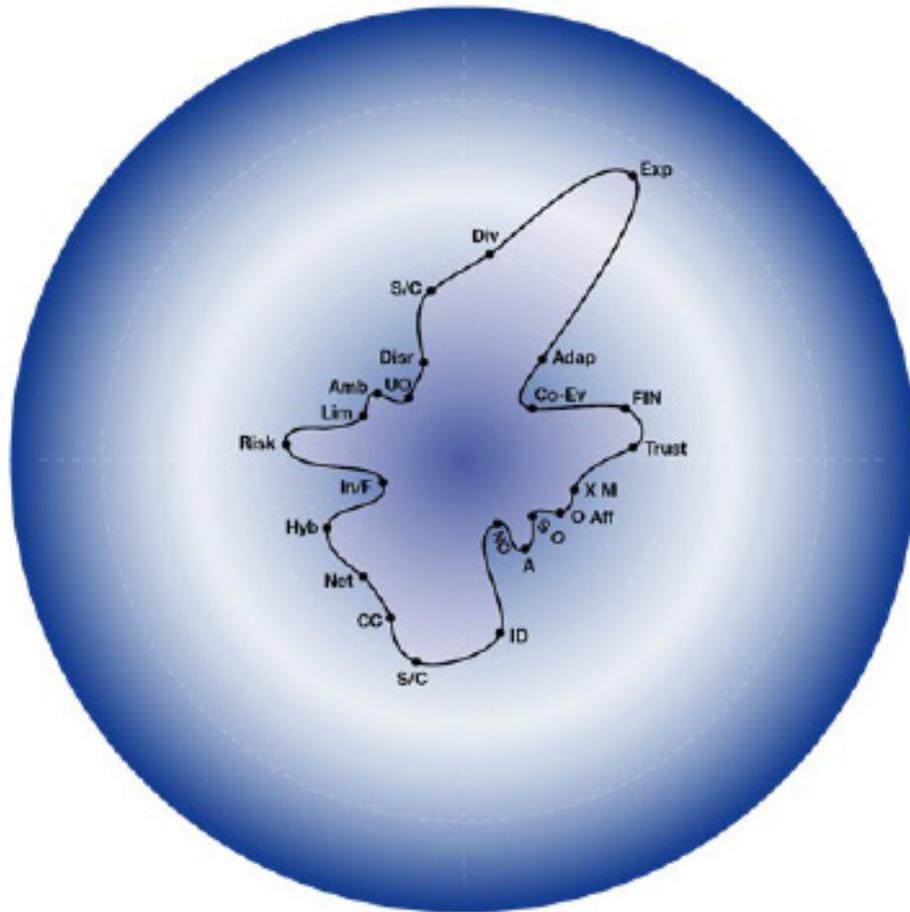
## Teacher Training through Flexible Distance Learning

A number of universities offer part-time, flexible, distance learning for primary teacher training programmes, through which students can qualify with teacher status and a PGCE.

The students in this case study differ from full-time students as they attend as few as three days face-to-face training sessions each term. Whilst away from the institution they are required to take responsibility for their own learning and manage their own time. However, online support is provided through discussion forums and opportunities for social networking by their peers, tutors, and mentors. They can nevertheless easily feel isolated.

The PGCE students follow a very broad but standards-driven curriculum (for qualified teacher status), in which there is little opportunity for negotiation or learner autonomy, and in which they are rigorously assessed. The assessment load can be very demanding. Some electives give the students opportunities for choice and increased ownership over their learning. The course is also highly practical; students learn through practice on school placements, which are also rigorously assessed.

Emphasis is placed on reflective learning both in and out of school, and students are required to keep portfolios of their work and reflective journals, which inform their practice and learning. These reflections feed into course evaluations and most courses have a student consultative group which meets with tutors. However, whilst tutors can respond to some feedback, major changes to a course can only be made through revalidation, a lengthy and complex process once every three to five years.



OPEN/STRUCTURES		INTERACTIVE/ENV.		AGENCY		PRESENCE/WRITING	
Risk	Risk	Diversity	Div	Cross-modal, multi-modal	X M	Solitude and contemplation	S/C
Liminal space (or: Ambiguity)	Lim	Experiential	Exp	Open affordances	OAff	Casual Encounters/conversations	CC
Ambiguity (or: Liminal Space)	Amb	Adaptive	Adap	Self-organisation	S O	Networks Encounters, engagement	Net
Unpredictable Outcomes	UO	Co-evolution	Co-Ev	Autonomy	A	Hybrids	Hyb
Disruption	Disr	Frequent Interaction and Networking	FIN	Negotiated Outcomes	N O	Informal writing and inscriptions:	In/F
Self-correction	S/C	Trust	Trust	Identity	ID		
Multipath	Mp	Theory of Mind	Tom				

Figure 6. Teacher training footprint and key.

## Masters Degree in e-Business and Innovation (EBIN)

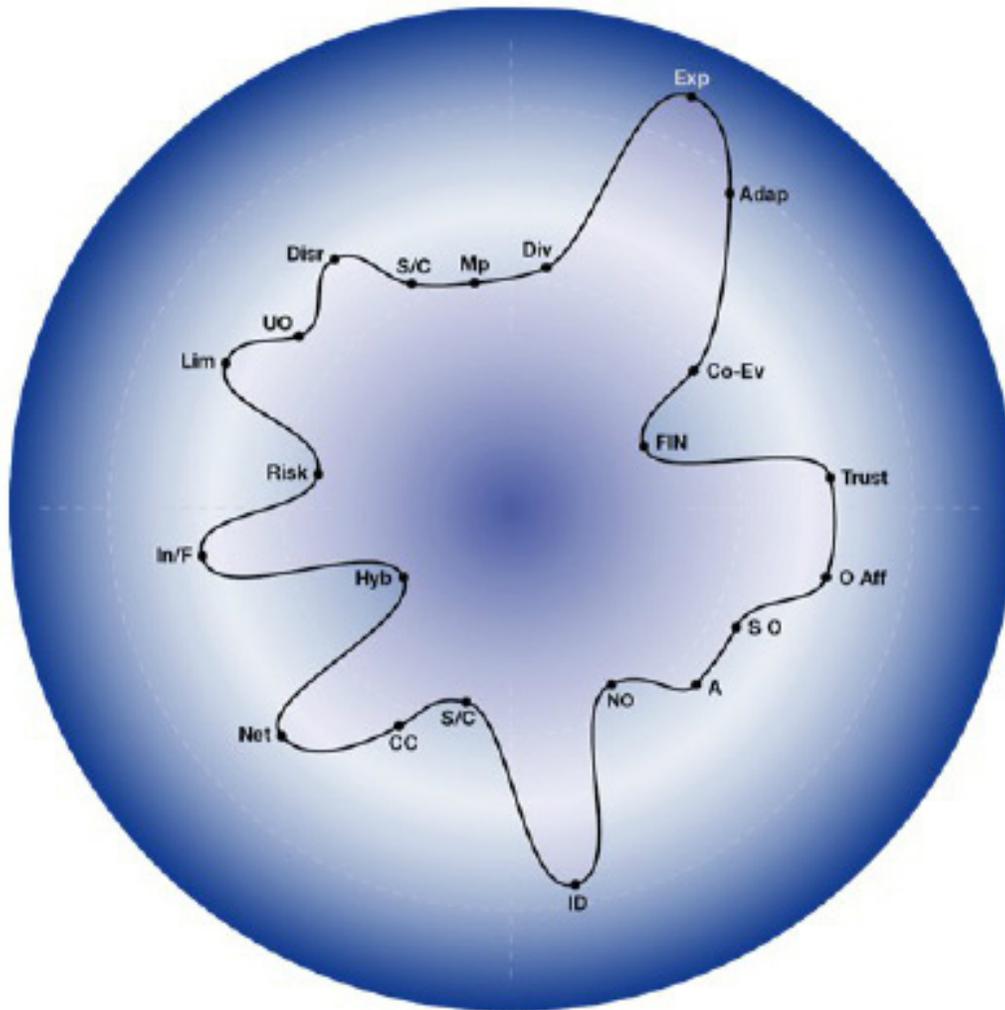
Lancaster University runs a unique multidisciplinary [Masters degree in e-Business and Innovation](http://www.lums.lancs.ac.uk/masters/MScEbusiness/) (EBIN, see <http://www.lums.lancs.ac.uk/masters/MScEbusiness/>). This programme is jointly organised between the Management School and the Computer Science Department. It also draws on the expertise of the Institute for Entrepreneurship and Enterprise Development and the Business Enterprise Centre and [Infolab21](#).

The programme's approach to module design recognises the increasing functionality and complexity of the Web as an opportunity for innovation and creativity. Two modules, EBIN 521, Technology for e-Business, and EBIN 527, Software Innovation and Entrepreneurship, were designed as 'open' curricula. In the words of Dr Gerd Kortuem, module leader in 2010-2011, they "provide spaces for students to grow into."

The emphasis is on producing a new breed of innovative people who understand and are able to advance the state of the art in technical, design and business: innovative people prepared to work in challenging roles in organisation and ready to drive radical change in the digital economy.

Students are expected to see themselves as self-starters, able to create jobs, roles, and opportunities for themselves.

The open curriculum requires students to select and suggest topics for study, raise their own questions and determine what is relevant for project work and assignments, embrace the holistic cross-disciplinary curriculum, work individually and collaboratively, and be open and communicative. The aim is not only to develop students as keen critical thinkers who can demonstrate scholarship, but also as entrepreneurs who can learn and work in increasingly complex real-world environments, deal with uncertainty, spot opportunities, and make things happen. The students have considerable freedom to follow their own paths, but it is recognised that students may find this non-traditional approach challenging and unsettling.



OPEN/STRUCTURES		INTERACTIVE/ENV.		AGENCY		PRESENCE/WRITING	
Risk	Risk	Diversity	Div	Cross-modal, multi-modal	X M	Solitude and contemplation	S/C
Liminal space (or: Ambiguity)	Lim	Experiential	Exp	Open affordances	QAM	Casual Encounters/ conversations	CC
Ambiguity (or: Liminal Space)	Amb	Adaptive	Adap	Self-organisation	S O	Networks Encounters, engagement	Net
Unpredictable Outcomes	UO	Co-evolution	Co-Ev	Autonomy	A	Hybrids	Hyb
Disruption	Disr	Frequent interaction and Networking	FIN	Negotiated Outcomes	N O	Informal writing and inscriptions:	In/F
Self-correction	S/C	Trust	Trust	Identity	ID		
Multipath	Mp	Theory of Mind	Tom				

Figure 7. EBIN footprint and key.

EBIN521 has been running for nine years and EBIN527 for four years. Having started with a typically traditional approach to teaching, the module leader has taken an increasingly open approach to reflect the entrepreneurial skills that the students need to develop. This is not a *laissez-faire* approach. Each year the course materials have been rewritten to accommodate this in response to student feedback. The module leader is constantly aware of the need to find the correct balance between guidance, structure, and openness. The modules thus demonstrate adaptability and promote emergent learning. Both students and the module leader experience the uncertainty associated of the unpredictable outcomes in an open curriculum.

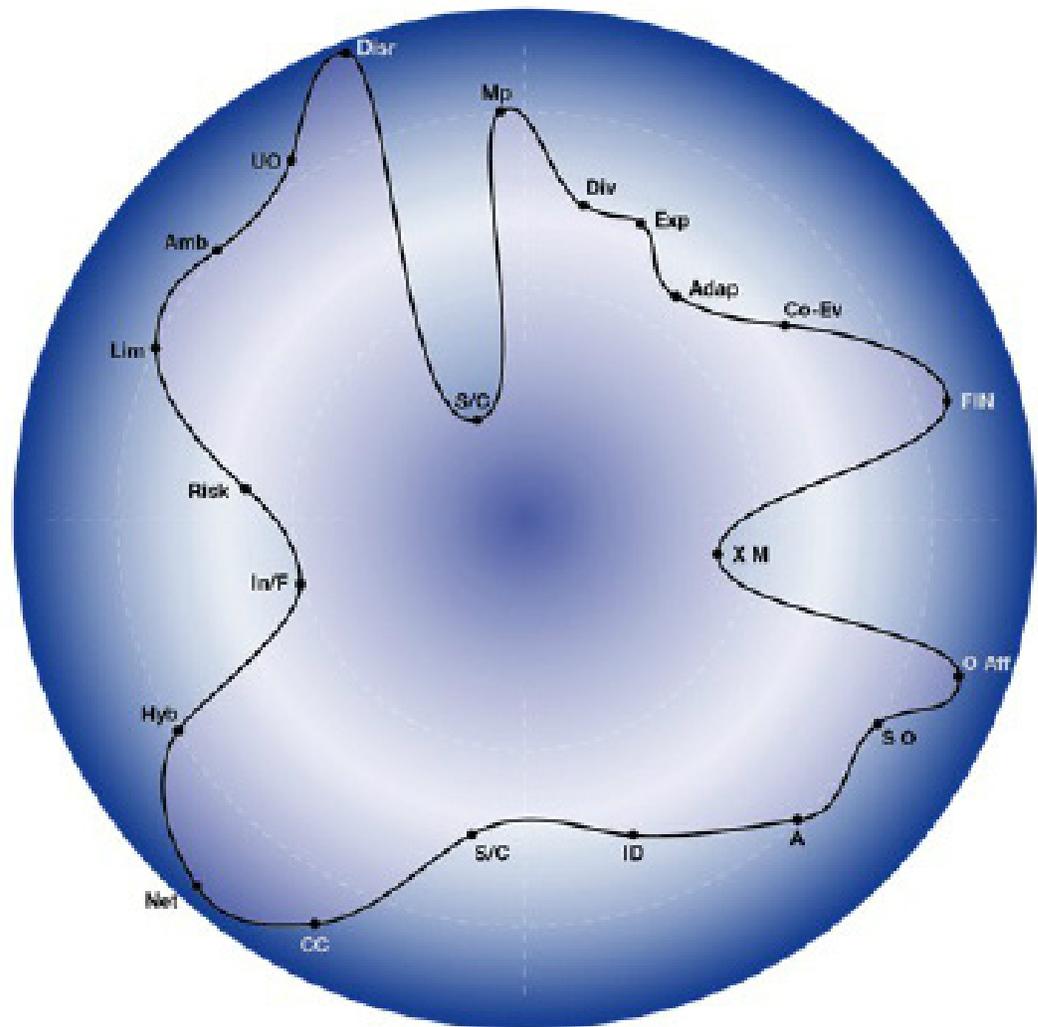
The footprint for this case study shows that this programme pulls the curriculum beyond traditional, prescribed boundaries, particularly in its approach to the design of the learning environment. Whilst it embraces uncertainty and ambiguity and is highly adaptable, it attempts to limit the risks that students experience. For example the programme leader's most recent adaptation has been to somewhat constrain the degree of openness in response to student concerns.

### CCKo8

This case study is based on papers by Mackness, Mak, and Williams (2010), Mak, Williams, and Mackness (2010), and Williams, Karousou, and Mackness (2011), where the CCKo8 course has been described in detail.

The Connectivism and Connective Knowledge course (CCKo8) was the first massive open online course. It was designed by Siemens and Downes to align with the characteristics of their proposed learning theory of connectivism, based on autonomy, diversity, openness, and interaction. The course ran between September and December 2008. Course participants were expected to use diverse, openly accessible resources, network with a range of participants to create their own learning paths, and organise themselves and their own learning. Through sharing of learning and resources, knowledge would be created through interaction and the artefacts produced. The design allowed for a substantial degree of emergent learning, and the outcomes could not be predicted. The course had an initial enrolment of 2,200, a much smaller number of active participants, and 24 students enrolled for formal accreditation.

The characteristics of connectivism are all evident in the footprint of the CCKo8 design, (Figure 8). There is plenty of space for openness (in the open/structure cluster), diversity (in the interactive environment cluster), autonomy (in the agency cluster), and connectivity (in the presence/writing cluster). However, the clusters in the footprints are not based on connectivist principles, but rather on a more detailed reading of complex adaptive systems and emergence (Williams, 2011; Williams, Karousou, & Mackness, 2011), in which the factors and dynamics are defined at a much finer level of granularity (see Appendix A & B).



OPEN/STRUCTURES		INTERACTIVE/ENV.		AGENCY		PRESENCE/WRITING	
Risk	Risk	Diversity	Div	Cross-modal, multi-modal	X M	Solitude and contemplation	S/C
Liminal space (or: Ambiguity)	Lim	Experiential	Exp	Open affordances	O Aff	Casual Encounters/ conversations	CC
Ambiguity (or: Liminal Space)	Amb	Adaptive	Adap	Self-organisation	S O	Networks Encounters, engagement	Net
Unpredictable Outcomes	UO	Co-evolution	Co-Ev	Autonomy	A	Hybrids	Hyb
Disruption	Disr	Frequent Interaction and Networking	FIN	Negotiated Outcomes	N O	Informal writing and inscriptions:	In/F
Self-correction	S/C	Trust	Trust	Identity	ID		
Multipath	Mp	Theory of Mind	Tom				

Figure 8. CCK08 design and key.

In reality, as discussed in detail in Mackness, Mak, and Williams (2010) and Williams, Karousou, and Mackness (2011), the lack of constraints in the design and the moderation of this course meant that many participants experienced some of the characteristics of emergent learning as sour and even on the edge of chaos, rather than sweet. This is evident in the way the footprints change through the course (Figure 8.1 through 8.4, and 9), as a domineering troll disrupts the course (8.1), then leaves and the course settles down (8.2), then the course designer imposes a control phase (8.3), and finally the course settles down again in the roundup phase (8.4) till the end (see the Discussion section for more details).

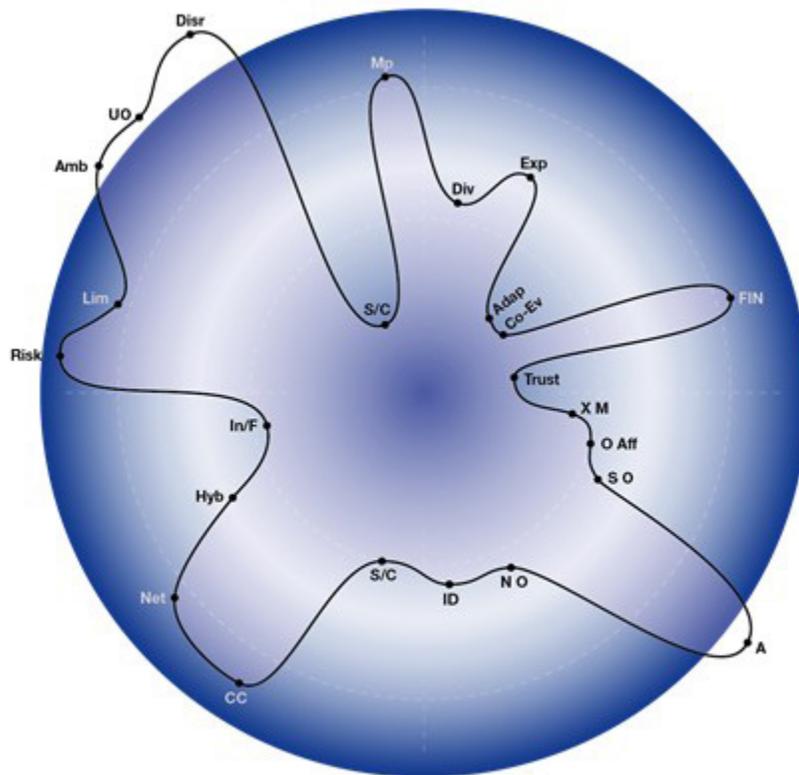


Figure 8.1. Troll phase.

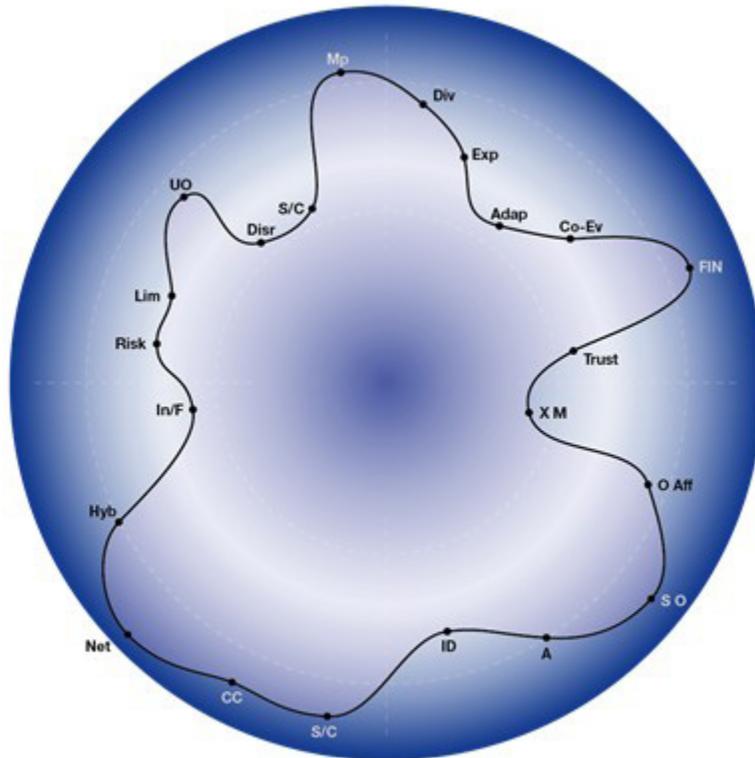


Figure 8.2. Settled phase.

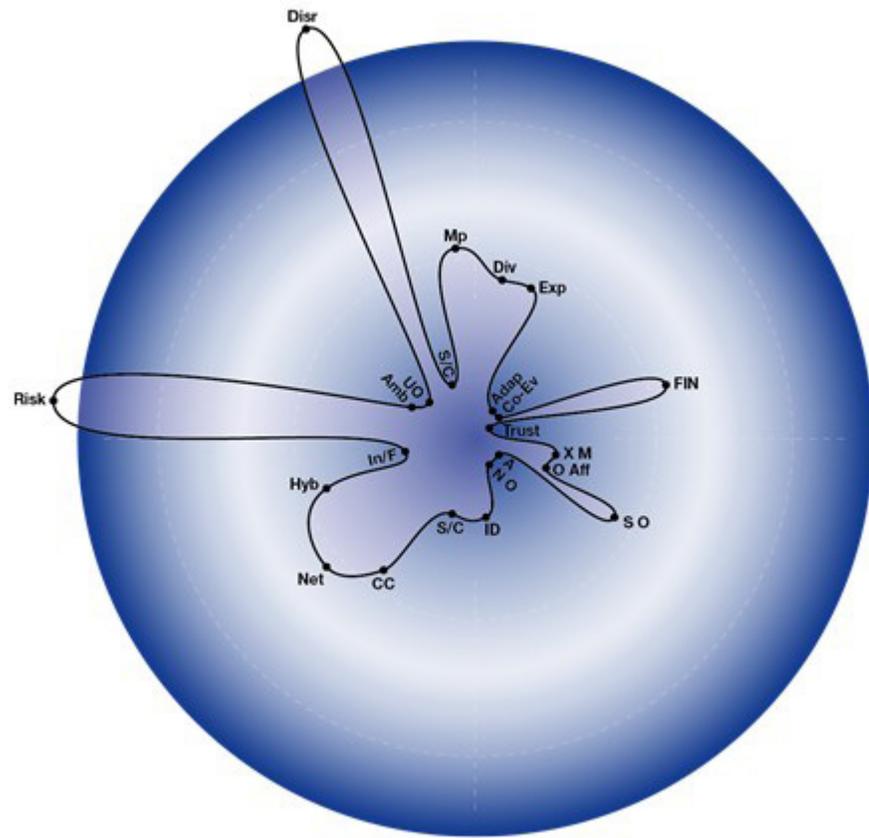


Figure 8.3. Control Phase.

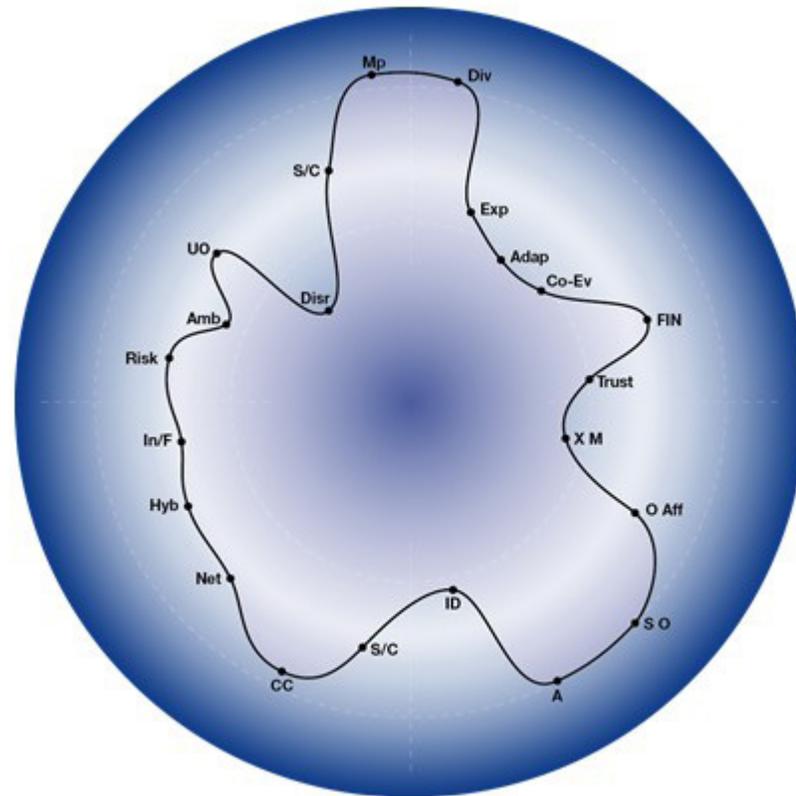


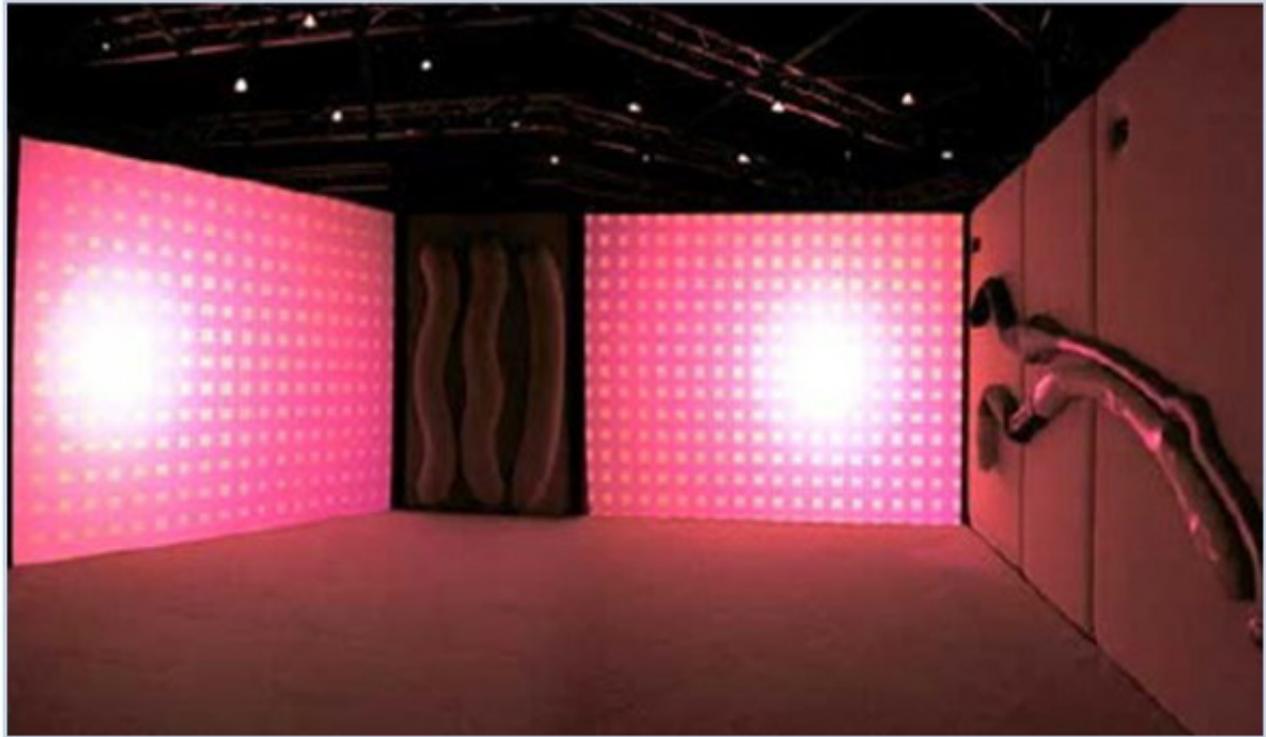
Figure 8.4. Roundup.

## MEDIATE

The MEDIATE space (Multisensory Environment Design for and Interface between Autistic and Typical Expressiveness, see <http://vimeo.com/15387871>) was designed for so called low-functioning children on the autistic spectrum with little or no verbal skills. It was a collaboration of five teams across Europe, involving designers, programmers, and psychologists (Parés et al., 2005; Timmermans et al., 2004; Gumtau et al., 2005).

One of the design paradigms was to strive for agency (Happé, 1999; Frith & Happé, 1999; Heaton, 1999): putting the children “in charge” of an environment that was at once rich with sensory offerings and devoid of any social context or symbolic content. Another important design paradigm was the cross-modal, or ‘synaesthetic’ aspect (Williams, Gumtau, & Mackness, 2012).

The environment (Figure 9) was not designed to deliver a specific learning schedule, but rather to engage children with autism, enable them to feel in control of their space, and perhaps to play and explore areas of novelty, in behaviour, expressiveness, and agency. Through observing this dialogue, the parent or carer in turn might learn something about the child’s behaviour, expressions, and sensory preferences.



*Figure 9. The MEDIATE environment.*

The interactive agenda and dialogue was to be driven by the child, without instructions, so the environment had to be accessible and intuitive. The premise was to allow novel and creative behaviour and expression to emerge, and the interactive design had to move beyond predetermined, prescribed sequences.

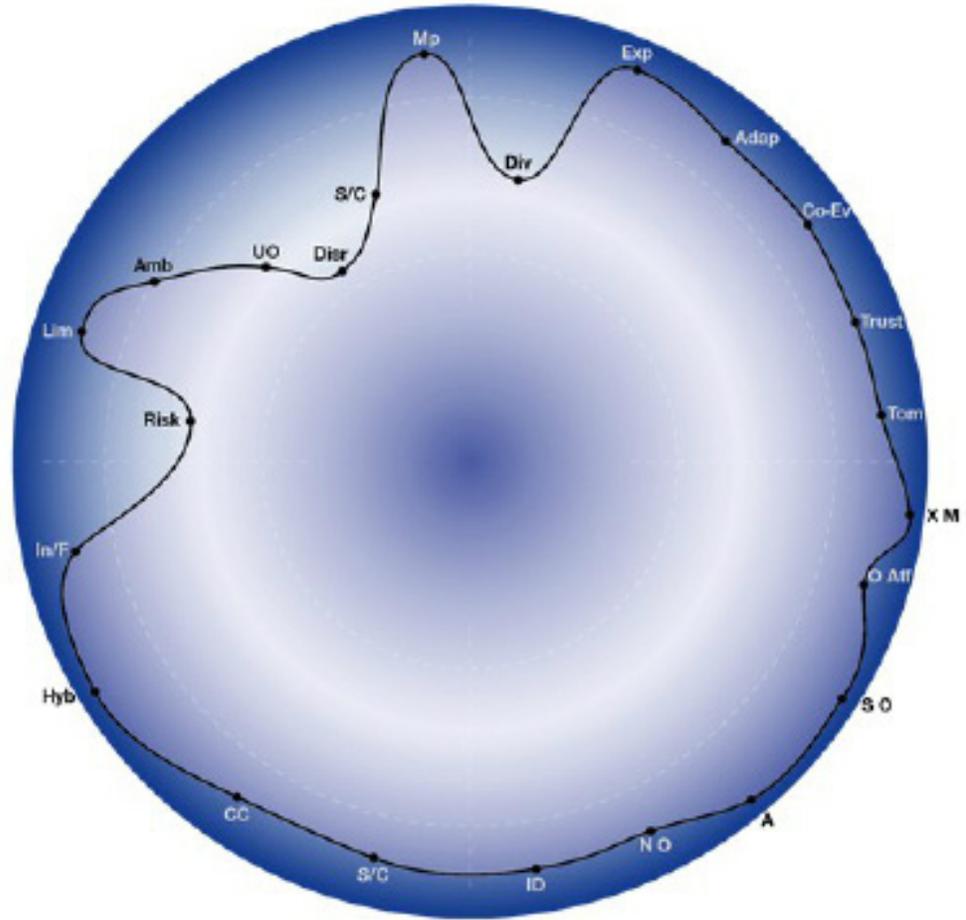
MEDIATE was a fairly large, almost round space, which did not contain too many elements to fixate upon, but enough to experience and explore. The look and feel integrated a range of organic and haptically interesting materials and shapes and space to move around freely.

The adaptive interactive system included pattern detection software, which allowed the system to build up unique, individual sensory profiles and to identify novel idiosyncratic behaviour. The system then produced responses on the basis of whether the child was inert, fixating and repetitive, or novel and exploratory. This adaptive pattern detection and response provided a rudimentary ‘mind’ for the child to interact with. The challenge was to implement rules within the system that would allow for as much self-organization and adaptability as possible (Figure 10).

If the child displayed novel behaviour, the system increased the complexity of the interaction, starting off with a sensory feedback loop, or amplification of one’s body. For instance, the interactive floor first produced footstep sounds, akin to walking on crunchy leaves, directly corresponding to the weight and gait of the person. After a while, the footstep’s sound changed slightly into more complex and slightly more abstract responses, first a pitched

crunch and later a singing voice. The tunefork (on the right hand wall, Figure 9) evolved similarly and was capable of cross-modality, such as a tap on the tunefork changing the colour of the screen.

The interactive design in *MEDIATE* starts with fairly direct feedback, and once familiarisation takes place the responses become more complex to keep the interaction interesting and encourage novel behaviour.



OPEN/STRUCTURES		INTERACTIVE/ENV.		AGENCY		PRESENCE/WRITING	
Risk	Risk	Diversity	Div	Cross-modal, multi-modal	X M	Solitude and contemplation	S/C
Liminal space (or: Ambiguity)	Llm	Experiential	Exp	Open affordances	OAff	Casual Encounters/ conversations	CC
Ambiguity (or: Liminal Space)	Amb	Adaptive	Adap	Self-organisation	S O	Networks Encounters, engagement	Net
Unpredictable Outcomes	UO	Co-evolution	Co-Ev	Autonomy	A	Hybrids	Hyb
Disruption	Disr	Frequent Interaction and Networking	FIN	Negotiated Outcomes	N O	Informal writing and inscriptions	In/F
Self-correction	S/C	Trust	Trust	Identity	ID		
Multipath	Mp	Theory of Mind	Tom				

Figure 10. MEDiate design footprint and key.

The MEDIATE interactive 'scape was used by a range of children, including two children we call Mr Tunefork and Mr Purple.

Mr Tunefork is a 5-year-old male without a diagnosis of autism. His visit was remarkable in that without any musical training he commandeered the sounds produced by the tunefork, a rather unusual instrument, to a high level of structured rhythm and pace. He moved up and down the bas-relief branch design, seemingly randomly touching and playing with the textures first then gradually composing a fairly complex sound-piece (Figure 10.1).

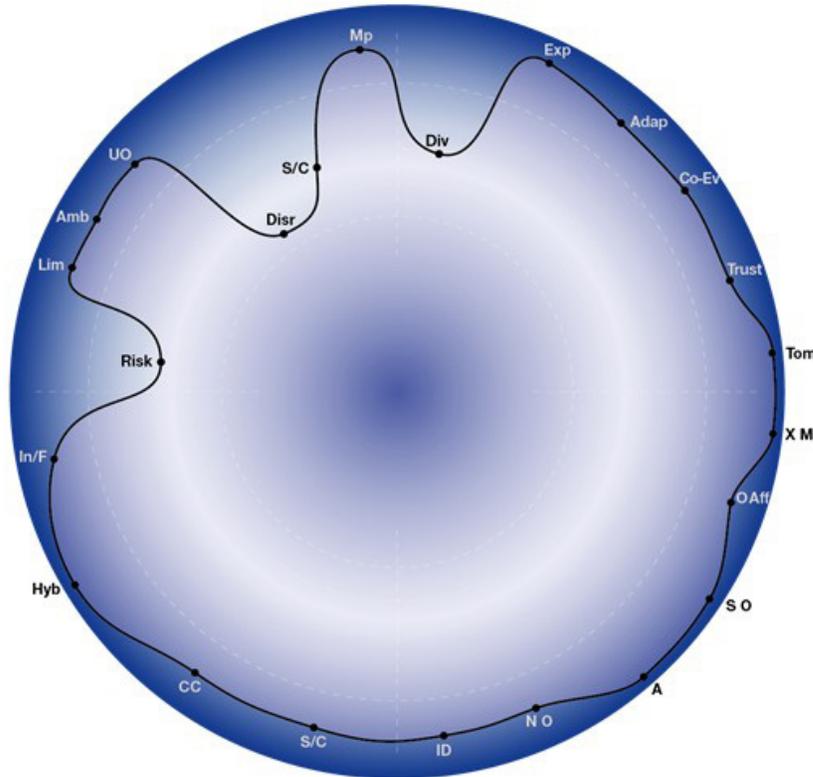


Figure 10.1. Mr Tunefork.

Mr Purple is a 9-year-old male with a diagnosis of Asperger's Syndrome, who experienced the environment at several stages. At one point the interaction level had moved to a greater complexity and thereby cross-modality, and he was able to change the colour of the screens by tapping on the tunefork. He proceeded to repeatedly select a purple hue. This might have gone unnoticed, but his mother observed it and felt that this might be a form of sensory expression that MEDIATE enabled. The family proceeded to paint his bedroom in this purple hue and consequently experienced a much calmer child, able to sleep through the night for the first time in years (Figure 10.2).





### **Teacher training.**

The teacher training footprint is largely confined to the prescribed zone (Figures 6 & 11). The teacher training course has to comply with closely defined, prescribed learning outcomes, but a few aspects of the course provided possibilities for emergent learning. The course was designed to be experiential; students were required to create their own learning spaces and be self-organised; reflective learning was encouraged for students to develop their identities as teachers. In reality the focus on compliance, stringent standards, and an over-loaded curriculum meant that there was little or no space for emergent learning. However, since the design of the programme in 2000, advances in technology have led to the students independently using social networking sites, such as Facebook and Twitter, which provide affordances for emergence.

The footprint diagram clearly indicates that all the characteristics that might lead to emergent learning (with the exception of experiential) are confined within the central, prescribed/compliance zone, which predominates. The questions for course designers are whether it is desirable to encourage emergent learning and how this can be achieved whilst meeting the required standards.

A revalidation of the programme in 2010 included new modules designed to increase reflective learning and creativity. Students are now required to arrange placements for themselves in a non-school setting, such as a museum. These modules allow greater opportunities for emergent learning, but the overall, standards-driven curriculum is still focused on prescribed skills and competencies, “*so that they don’t damage other people’s lives*” (a quote from a teacher training tutor).

### **EBIN.**

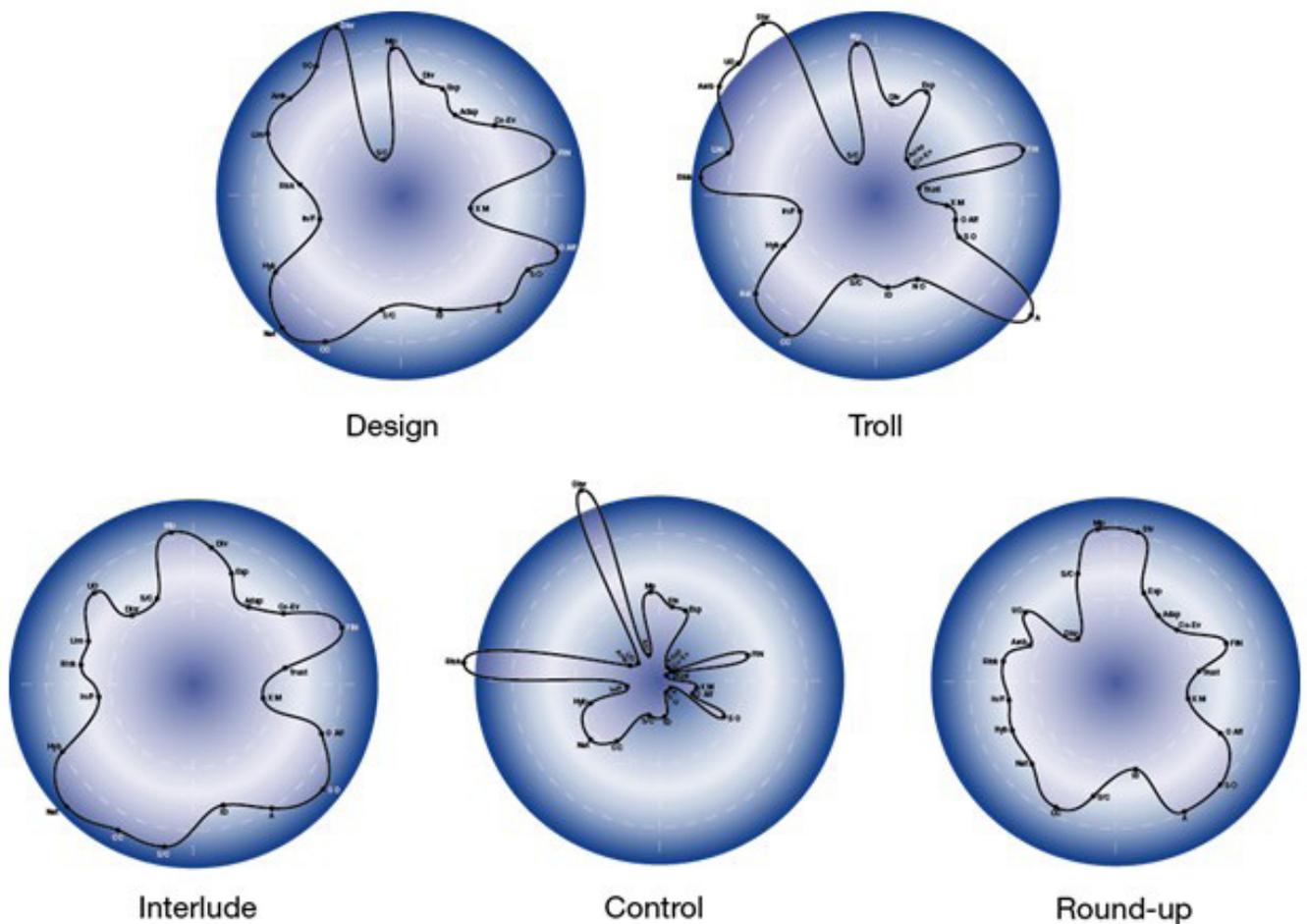
The e-business and innovation case is substantially located in the sweet zone for emergence. Some parts are within the prescriptive zone and, like teacher training, the practical experience part of the course provides opportunities for emergent learning and requires self-organization and initiative.

The EBIN footprint shows that learner autonomy and negotiation are encouraged by the programme (Figures 7 & 11), but the extent to which they can be achieved in practice is constrained by assessment. Whilst some flexibility is built into the assessment, for example students can choose how to present their assignment and the project they wish to work on, these choices must be agreed by the programme leader before students can start work. The footprint maps out the tensions in the course between the prescriptive approach determined by the constraints of a traditional academic system and the ‘sweet emergence’ and ‘openness’ offered by the module leader’s efforts to be innovative and creative.

**CCKo8.**

The CCKo8 course, on the other hand, was designed as radically open and without constraint, which potentially maximised disruption of and challenges to traditional ways of learning. The risk to participants could be minimised, but only if they exercised the comparably radical degree of autonomy offered and retreated to their own spaces, such as blogs, which many participants did. Whether or not all the participants wanted to exercise such autonomy or thought it would be appropriate to do so is open to question. This may also have been affected by the extent to which the course was seen as a free-for-all as opposed to an environment in which there is mutual trust and respect.

In CCKo8 the presence of a troll (someone who deliberately disrupts the course through making inflammatory posts) in the discussion forums in the early weeks (Figures 8.1 and 12) and later a demonstration by one of the course convenors of how power can be exercised in a network (Figures 8.3 and 12) served to break down trust and respect for many participants (see Mackness, Mak, & Williams, 2010).

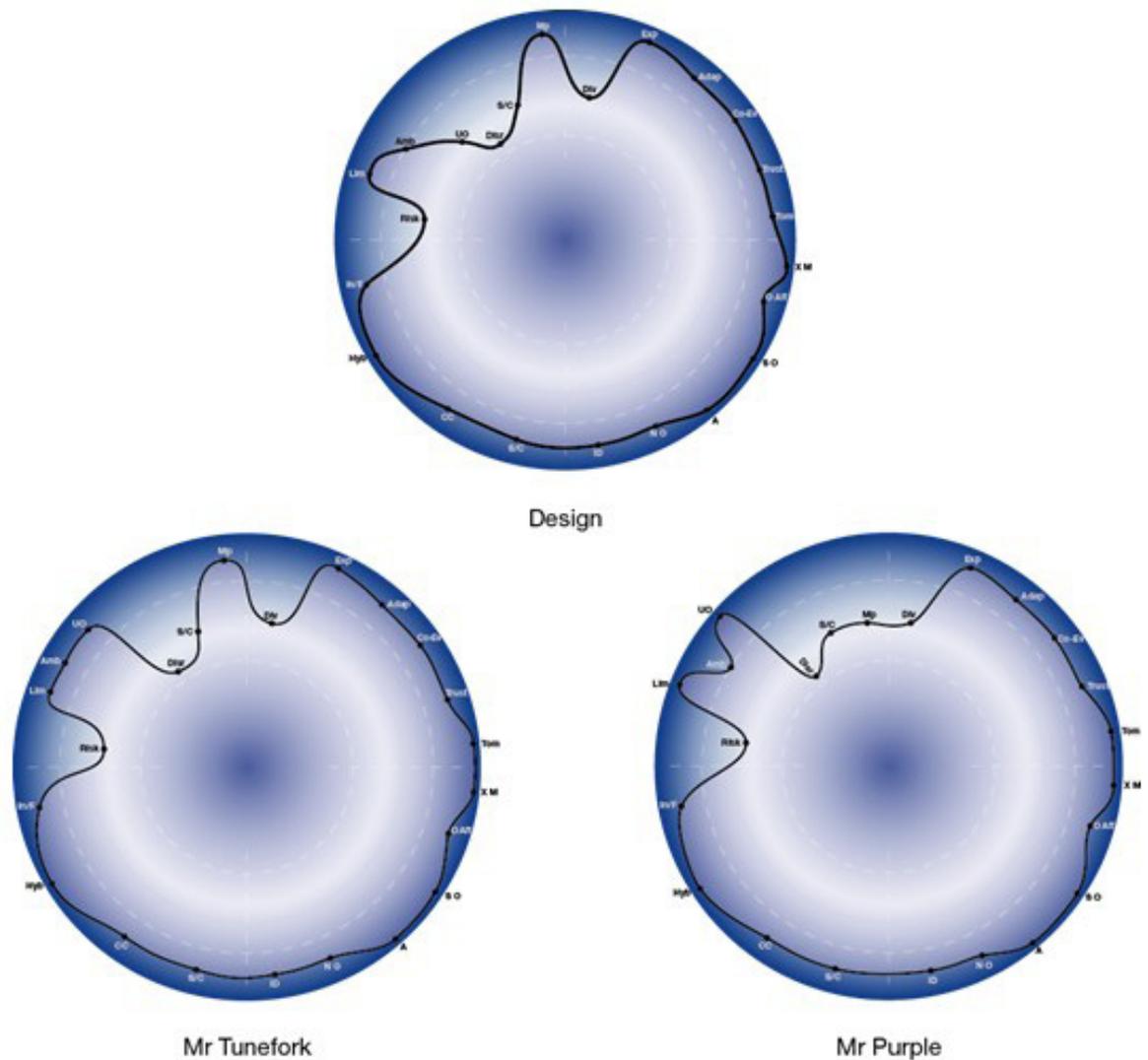


*Figure 12. The design and four phases of CCK08.*

This restructuring of the CCKo8 learning 'scape is clearly evident in the footprints (Figure 12), which contrast markedly in these two phases, in which some factors go over the edge into potential chaos. There is however an interesting contrast between the troll and control phases: in the troll phase, despite the disruption, participation continued at quite a high level in terms of the amount of interaction, although the number of participants dropped. The online interaction picked up quickly after the troll withdrew. On the other hand, although a larger number of people objected to the control intervention, there was much less interaction on any of the substantial themes of the course during this phase, and this is evident in the larger 'space' in the footprint in the troll phase compared to the control phase. The interaction did not pick up as quickly in the roundup phase that followed. Perhaps most interesting about the CCKo8 footprint is that whilst it is easily recognisable as a course which has been designed to support and promote unpredictable outcomes and emergent learning, how that is experienced by participants varied considerably. So what might be experienced as sweet emergence for some was experienced as sour or on the edge of chaos by others.

### **MEDIATE.**

Although almost the whole MEDIATE footprint is quite close to the edge, the space was designed to provide a carefully graded approach to emergence: firstly establishing an interactive comfort zone and then moving on, step-wise, to more open interaction. This was achieved by starting with direct feedback from the body, and only once the child seemed comfortable, moving on to more complexity to keep the interaction interesting and encourage novel behaviour (Figures 10 – 10.2 and 13).



*Figure 13.* The MEDIATE design and two participants.

Most of the children who participated in MEDIATE were on the autistic spectrum and would be expected to experience strange, dark spaces as disorientating, if not frightening. None of them did. On the contrary, they intuitively found the space to be welcoming and safe for exploration and expression, quite dramatically so. The pink colour, the soft, responsive surfaces, from underfoot to the walls, the soft lighting, and the soft, gently inviting-and-challenging ‘mind’ all contributed to this (Figure 9).

Moreover, it was not an external ‘thing’ to interact with, but, on the contrary, a place to enter into, quite literally in a deeply embodied and immersive sense; it was soft, welcoming, pneumatically inviting, and responsive for the feet, the hands, the face, and the whole body.

Within this space they found safety and comfort at a rich, encompassing, unmediated, and ‘deeply synaesthetic’ level.

## Integrating and Balancing Prescribed and Emergent Learning

Emergent learning is by definition open, complex, adaptive, and self-organised, and therefore not predictable. The 3D footprints demonstrate one way to begin to describe it, across 20-25 dynamically changing parameters in a 3D topography. Our case studies confirm that emergent learning is indeed that rich and complex (see also Sims & Kays, 2011).

The challenge is not to increase emergence *per se*, but rather to create a dynamic and appropriate balance between emergent learning and personal development on the one hand, and the necessary structure and constraint on the other hand (Williams, Karousou, & Mackness, 2011; Cilliers, 2005). Emergent learning can all too easily slip into prescription on the one hand, or chaos on the other. The topography does not provide for a definitive analysis of all possible issues. But it does oblige you to think through the dynamics and to critically examine just how much prescription, sweet or sour/sharp emergence, and closeness to the edge of chaos is useful not just for a particular course or context, but also across different phases and for different participants.

## Organization

The footprints map out how the design ‘scape changes, based on the actions of the teachers and learners. In MEDiate the participants create their own interactive footprints, which vary from the design ‘scape and from those of the other participants. The MEDiate ‘scape is a finely tuned interactive space, perceived and explored differently by each participant as they establish their own affordances (Figure 13).

In CCKo8 the interventions from the course organisers dramatically changed the learning ‘scape and the available affordances (Figure 9). In EBIN the design phase provided a mix of prescribed and emergent learning, but the course organiser felt that he had to provide more structure as the course progressed in response to student feedback. In the teacher training course, much of the course was prescribed learning, but work experience provided for emergent learning, and subsequent developments in the course have added to this.

The footprints cannot capture all of the rich, dynamic variety, but they do provide a multi-variable template. All descriptions of complex events have to be flexible and adaptive too, to reconfigure the clusters or the underlying topography from one case, phase, or even participant to another.

## Designing and Curating for Emergence

It is by definition not possible to manage emergence, but it is possible to design, curate, and organise interactive ‘scapes in which emergent learning is likely to occur. The people who organise and structure the event as well as the participants must contribute to the emergence and development of the course. Both must exercise initiative, creativity, and be prepared to take some risks. For emergence to work, both structure and agency must co-evolve.

## Conclusion

The topography of learning is a rich, three dimensional visual template, which enables us to map out, describe, and explore the complex relationships and dynamics of adaptive, co-evolving, ordered-yet-unpredictable learning. For the first time, perhaps, it also explicitly integrates and acknowledges the value of prescribed learning, the central repository of core knowledge. The topography provides a visual metaphor for exploring how and why learners move back and forth between the zones of prescribed learning and emergence.

Openness provides scope for creativity, emergence, and personal growth, but if pushed too far may become confusing and disorienting. The template is a practical tool for describing these dynamics: of comfort and risk, structure and agency, from fail-safe to safe-to-fail to learning on the edge, a map as well as a panopticon for emergent learning. The topography needs to be both coherent and practically useful, so it was tested in a workshop at the Future of Theory in Education Conference at Stirling University, UK, in 2012. Participants were given a short introduction to the footprints, and within an hour had drawn detailed footprints of their own courses (either as lecturers or as students). The footprints provided rich material for conversations about their courses, comparisons between courses, the dynamics of change, the balance between emergence and prescription, and how this affects the experience of the courses.

The clusters and the factors provide micro-lenses through which we can examine particular aspects and functions within the curriculum and explore the way factors vary across the emergent/prescribed spectrum and across the dynamics of a learning event. However the factors do need to be taken together; the whole is more than the sum of its parts, and the dynamics of the topography itself is a vital resource for learning and emergence.

The case studies also show that, contrary to what we know about complex emergent systems in general, emergent learning can even take place without much interaction between participants. EBIN offered the possibility of emergent learning without sustained, frequent interaction. *Solitude and contemplation* is an essential if unusual inclusion as a factor (in the presence/writing cluster) for this reason. In MEDIATE, emergent learning, self-organization, and co-evolution of agency is achieved by what looks like solitary learners, although the 'mind' within MEDIATE provides a sophisticated proxy for them to engage *with*, or, as Bateson might say, to engage *in*, as he saw *mind* as an ecology, not as discrete and individual (1972).

The presence or absence of particular factors, in itself, does not guarantee that emergent learning will occur. A sensitive and adaptive approach is required to establish and maintain co-evolution between agency and structure, organisers and participants, repetition and disruption. This was exemplified in MEDIATE.

The interactive learning 'scape as a whole is the emergent and dynamic equivalent of the traditional curriculum. This is not to say that a largely prescribed curriculum is not appropriate in particular contexts. On the contrary, the prescriptive topography of the teacher

training course seems to have been successful on its own terms as was the radically emergent topography of MEDIATE.

The role of organising emergent learning 'scapes is an *engaged curatorial* role, rather than a teaching, facilitating, or even moderating one. Curating the topography of learning requires the course convenor to step back at times; it not only invites but requires self-organization, self-motivation, and creativity. This is nothing new. Montessori's approach, developed a century ago, with her focus on embodied learning and internal motivation was an exemplar of an engaged curatorial role and the co-evolution of structure and agency. The MEDIATE space could be seen as an extension of that approach (see Williams, Gumtau, & Mackness, 2012 for a more detailed discussion of these issues).

This new topography of learning is a different kind of curriculum. No longer static, it is likely to be emergent, at least in part, even if the overall design is prescribed, and it can be specifically designed to enhance emergence. We need (at least) a 3D, multivariate framework to map out and understand the learner experience and the dynamics of how co-evolution happens over time. The footprints of emergence are one example of how this may be done, and how emergent learning can be sweet, sour or sharp, or can fall into either chaos or repetition and routine.

## References

- Bateson, G. (1972). *Steps to an ecology of mind*. University of Chicago Press.
- Barnett, R. (2007). *A will to learn. Being a student in an age of uncertainty*. OUP.
- Cilliers, P. (2005). Complexity, deconstruction and relativism. *Theory, Culture and Society*, 22(5), 255-267.
- Frith, U., & Happé, F. (1999). Theory of mind and self-consciousness: What is it like to be Autistic? *Mind and Language*, 14(1), 82-89.
- Gumtau, S., Newland, P., Creed, C., & Kunath, S. (2005). *MEDIATE. A responsive environment designed for children with autism*. Accessible Design in the Digital World Conference.
- Gumtau, S. (2011). *Affordances of touch in multi-sensory embodied interface design* (Unpublished PhD thesis). University of Portsmouth, UK.
- Happé, F. (1999). Autism: Cognitive deficit or cognitive style? *Trends in Cognitive Sciences*, 3(6), 216-222.
- Heaton, P., Hermelin, B. & Pring, L. (1999). Can children with autistic spectrum disorders perceive affect in music? An experimental investigation. *Psychological Medicine*, 29, 1405-1410.
- Mackness, J., Mak, Sui, Fai, J. & Williams, R. (2010a). The ideals and reality of participating in a MOOC. In [Networked Learning Conference, Aarlborg \(pp. 266-274\)](#). Retrieved from <http://www.lancs.ac.uk/fss/organisations/netlc/past/nlc2010/abstracts/Mackness.html>
- Mak, Sui, Fai, J., Williams, R. & Mackness, J. (2010b). *Blogs and forums as communication and learning tools in a MOOC*. In [Networked Learning Conference, Aarlborg \(pp. 275-284\)](#). Retrieved from <http://www.lancs.ac.uk/fss/organisations/netlc/past/nlc2010/abstracts/Mak.html>
- Morrison, K. (2007). Educational philosophy and the challenges of complexity theory. *Educational Philosophy and Theory*, 40(1), 19-34.
- Parés, N., Masri, P., Wolferen, G., & Creed, C. (2005). *Achieving dialogue with children with severe Autism in an adaptive multisensory interaction: The "MEDIATE" Project*. IEEE
- Ramachandran, V.S. (2003). *The emerging mind*. Reith Lectures. Retrieved from: <http://www.bbc.co.uk/radio4/reith2003/>
- Reilly, M.A. (2012). *Bold schools: Part I - Learner as Knowmad*. Retrieved from <http://>

maryannreilly.blogspot.co.uk/2012/01/bold-schools-part-i-learner-as-knowmad.html

- Siemens, G., & Downes, S. (2008, 2009). Connectivism & connected knowledge [Online Course]. Retrieved from [http://connect.downes.ca/archive/09/12\\_03\\_thedaily.htm](http://connect.downes.ca/archive/09/12_03_thedaily.htm)
- Sims, R., & Kays, E. (2011). *Special issue: Emergent learning, connections, design for learning*. *IRRODL*, 12(7). Retrieved from <http://www.irrodl.org/index.php/irrodl/article/view/883/1686>
- Snowden, D.J., & Boone, M. (2007). A leader's framework for decision making. *Harvard Business Review*.
- Timmermans, H., Van Wolferen, G., Newland, P., & Kunath, S. (2004). MEDIATE: Key sonic developments in an interactive installation for children with autism. *Proc. Int'l Computer Music Conf.*
- Turkle, S. (2011). *Alone together. Why we expect more from technology and less from each other*. New York. Basic Books.
- Wenger, E., White, N., & Smith J. (2009). *Digital habitats: Stewarding technology for communities*. Portland, Oregon USA, CPsquare Press.
- Williams, R. (2011). Managing complex adaptive social systems. In *Encyclopedia of knowledge management* (2<sup>nd</sup> ed.). IGI Global.
- Williams, R., Gumtau, S., & Mackness, J. (2012, June). *Synaesthesia and embodied learning*. Theorising Education 2012: The Future of Theory in Education: Traditions, Trends and Trajectories Conference, University of Stirling.
- Williams, R., Karousou, R., & Mackness, J. (2011). Emergent learning and learning ecologies in Web 2.0. *International Review of Research in Open and Distance Learning*, 12(3). Retrieved from <http://www.irrodl.org/index.php/irrodl/article/view/883/1686>
- Williams, R., Karousou, R., & Mallia, C. (2011). Narrating the self: Intersections between the public and the personal. *Enhanced Learning in the Social Sciences*, 3(3), 1-26.

## Appendix A: Factors

The factors and clusters that we use to create the 3D footprints of emergence are based on theory, research, and practice in open and networked learning. In this appendix we outline the rationale for the factors in more detail; each of the *factors* is italicized.

The gist of the argument (see Williams, Karousou, & Mackness, 2011 for more detail) is that emergent behavior is the key characteristic of complex adaptive systems theory (see Cilliers, 2005; Snowden & Boone, 2007) and is based on *self-organising agents* who, in the case of human culture and learning, also reflexively articulate and organize their own *identity*.

Emergence flourishes when *agents and structure* mutually *co-evolve*, within *open affordances, autonomy, trust*, and within a balance between *ambiguity, disruption* and well-managed *risk* (including a measure of *self-correction*). The *outcomes* are to some extent *unpredictable* (depending on the balance between *structure* and *agency*), but they can often be *negotiated*. This can provide *liminal space* in which personal and professional development and ‘identity workshops’ can take place.

Extensive interaction between the self-organising agents is generally necessary, across a range of modes, such as *multi-path* communication, *diversity*, and *informal, formal, and hybrid* modes of interaction (including *casual communication* and serendipitous encounters in a range of social media and *networks*). The rich interaction of *experiential, cross-modal*, and embodied interaction (Ramachandran, 2003), in some cases with simulated ‘minds’ (see *MEDIATE*, above), provides a rich environment for adaptive, innovative, and creative learning. And, rather surprisingly, *solitude and contemplation* also plays a role, although this could be seen as interaction with a proxy mind (as in *MEDIATE*) or with agents or texts virtually in the imagination of the person concerned.

Table 2

*Clusters and Factors*

Clusters	Factors	Spectrum of characteristics
Open/ structures		The creative tension between openness and structure
	Risk	High risk of failure < > Safe-to fail < > Fail-safe
	Liminal space	Strange, transformative < > Conservative, traditional
	Ambiguity	Open to interpretation < > Established meaning
	Unpredictable Outcomes	Open to surprising outcomes < > Fixed, prescribed outcomes
	Disruption	Removing, inverting < ... > Defending, re-establishing
	Self-correction	Self-organised correction < > Hierarchical control
	Multipath	Many path, time and sequence options < > Narrow path definition
Interactive environment		The way the open/structure (design) factors are realised and curated
	Diversity	A range of resources, people and perspectives < > Homogeneity, standardisation
	Experiential	Engaged, embodied, subjects < > Objective, abstract, procedures
	Adaptive	Responsive, engaging, open co-evolving < > Standardised, fixed
	Co-evolution	Mutual adaptation and growth < > Fixed, hierarchical
	Inter-action & networking	Broad, open, networking < > Bounded learning space
	Trust	Mutual respect and growth < > Competitive self-interest
	Theory of mind	Interaction with other subjects / 'minds' < > Interaction with objects
Agency		Developing your capability for effective action, on your own terms
	Cross-modal, multi-modal	Synaesthetic, embodied, holistic engagement < > Mono-modal interaction
	Open affordances	Creative, innovative engagement < > Compliance with pre-determined outcomes
	Self-organisation	Organising your learning, interaction, self - < > Hierarchical organization
	Autonomy	Working independently, own agenda < > Working others' agendas

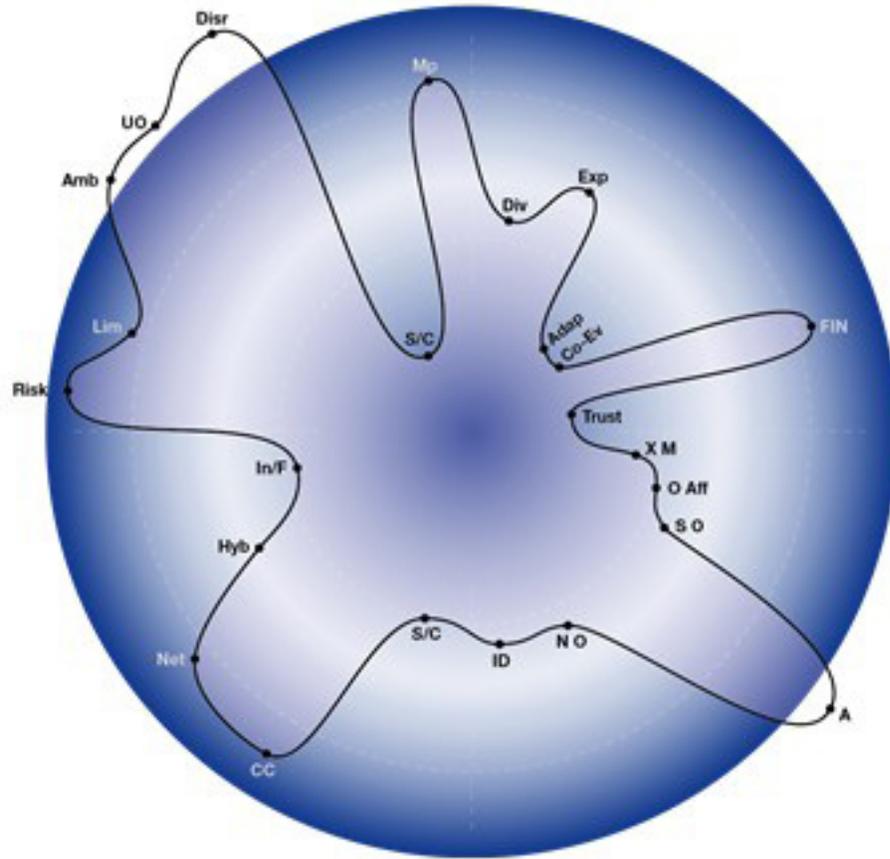
	Negotiated outcomes	Determining your own goals and success < > Compliance with prescribed outcomes
	Identity	Development of your own capability and roles < > Prescribed roles
Presence / writing		Exploring and networking the way you present yourself, your ideas and feelings
	Solitude & contemplation	Personal space for interaction with people, ideas, texts - in your imagination < > Isolation: untested ideas, individual echo-chambers
	Casual/ conversations	Chance, serendipitous, encounters < > Highly formalised interaction
	Networks, encounters	Initiating and engaging in a range of networks and communities < > Formalised, institutionalised interaction.
	Hybrids, informal/ ante-formal	Choice of media and modes < > Mono-modal, mono-media, abstract interactions
	In/formal writing and inscriptions	Informal, flexible, light, interaction < > Formal, ritualised interactions

## Appendix B: 'Scoring' the Footprints

The footprints were created by cross-checked or consensus scoring, using what was effectively a 30-point spectrum, divided into three 10-point zones, namely prescribed, sweet, and sharp/sour emergence (the last of which was broken down further, adding an additional 'marginal' category, that is on the 'edge of chaos' (29-30), and there was also a column for scoring factors that were 'off the scale' (i.e. 31+).

The scores are *relational* or indicative; they are not 'exact'. They were arrived at by cross-checking scoring between the authors for each of the specific footprints across phases and events within particular case studies and across case studies. The scores do not represent absolute *values*, but rather what we see as *vectors*, the degree to which a factor is pushed, pulled, squashed, drawn out, or extended towards or away from more or less prescription or emergence.

The underlying visual metaphor is of an elastic, 3D 'conceptual mat' (i.e., not a real, solid, static geological topography, but rather a 'plastic,' virtual one), which can be stretched and squashed in all three dimensions as the design and the dynamics of the 'co-evolution of structure and agency' adapt and change across a learning event.



Below is an example of a score sheet ( Table 3a and 3b, below) for the troll phase in CCKo8 (see Figure 8.1 above in the main text). The score sheet allows for factors *on the edge of chaos*, as well as *off the scale*. These scores indicate the position of each factor on the footprint.

Table 3a

*The Open/Structure and Interactive Environment Clusters, Troll Phase of CCKo8*

CCKo8: Troll Phase		Pre-scriptive	Sweet Emer.	Sour/ Sharp Emer.	Edge of Chaos	Off the Scale
		Fixed	Open	Edgy	Scary	Lost
Open/ structures	The creative tension between openness and structure	1 to 10	11 to 20	21 to 28	29-30	31 +
Risk	High risk of failure < > Safe-to fail < > Fail-safe				29	
Liminal space	Strange, transformative < > Conservative, traditional			22		
Ambiguity	Open to interpretation < > Established meaning					32
Unpredictable outcomes	Open to surprising outcomes < > Fixed, prescribed outcomes					32
Disruption	Removing, inverting < ... > Defending, re-establishing.					35
Self-correction	Self-organised correction < > Hierarchical control	4				
Multipath	Many path, time and sequence options < > Narrow path definition.			22		
Interactive environment	The way the open/structure (design) factors are realised and curated	1 to 10	11 to 20	21 to 28	29-30	31 +
Diversity	A range of resources, people and perspectives < > Homogeneity, standardisation					33
Experiential	Engaged, embodied, subjects < > Objective, abstract, procedures		15			
Adaptive	Responsive, engaging, open co-evolving < > Standardised, fixed	5				
Co-evolution	Mutual adaptation and growth < > Fixed, hierarchical	5				
Frequent interaction and networking	Broad, open, networking < > Bounded learning space			22		

Trust	Mutual respect and growth < > Competitive) self-interest	5				
Theory of mind	Interaction with other subjects / 'minds' < > Interaction with objects	n/a				

Table 3b

*The Agency and Presence/Writing Clusters, Troll Phase of CCKo8*

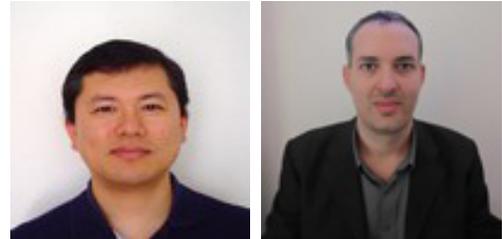
CCKo8: Troll Phase		Pre- scrip- tive	Sweet Emer.	Sour/ Sharp Emer.	Edge of Chaos	Off the Scale
		Fixed	Open	Edgy	Scary	Lost
Agency	Developing your capability for effective action, on your own terms	1 to 10	11 to 20	21 to 28	29-30	31 +
Cross-modal, multi-modal	Synaesthetic, embodied, holistic engagement < > Mono-modal interaction	8				
Open affordances	Creative, innovative engagement < > Compliance with pre-determined outcomes		12			
Self-organisation	Organising your learning, interaction, self - < > Hierarchical organization		15			
Autonomy	Working independently, own agenda < > Working within broader agendas					35
Negotiated outcomes	Determining your own goals and success < > Compliance with prescribed outcomes	8				
Identity	Development of your own capability and roles < > Prescribed roles		12			
Presence / writing	Exploring and networking the way you present yourself, your ideas and feelings.	1 to 10	11 to 20	21 to 28	29-30	31 +
Solitude and contemplation	Personal space for interaction with people, ideas, texts - in your imagination < > Isolation: untested ideas, individual echo-chambers	10				

Casual encounters/ conversations	Chance, serendipitous, encounters < > Highly formalised interaction			25		
Networks	Initiating and engaging in a range of networks and communities < > Formalised, institutionalised interaction			22		
Hybrids, informal/ ante-formal	Choice of media and modes < > Monomodal, mono-media, abstract interactions		14			
In/formal writing and inscriptions	Informal, flexible, light, interaction < > Formal, ritualised interactions	9				

Athabasca University 



## Understanding E-Learning Adoption in Brazil: Major Determinants and Gender Effects



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### Abstract

The objective of this study is to examine factors influencing e-learning adoption and the moderating role of gender. This study extends the technology acceptance model (TAM) by adding attitude and social interaction. The new construct of social interaction is applied to the South American context. Gender effects on e-learning adoption from educators' perspectives have seldom been explored. The data collection takes place in three major Brazilian universities. In total, 446 faculty members responded to the questionnaire. Our structural equation modeling reveals that ease of use and perceived usefulness are significant antecedents of attitude, which in turn affects intention. However, unlike the original TAM, perceived usefulness is not a direct driver of intention. In terms of moderation, gender affects three relationships: (1) ease of use → perceived usefulness; (2) perceived usefulness → attitude, and (3) intention → actual behavior. The analysis is carried out in a single country; thus, caution should be taken in generalization of the results. The findings will help academics, educators, and policy makers to better understand the mechanism of e-learning adoption in Brazil.

**Keywords:** BRIC; e-learning; gender; technology acceptance model; social interaction

## Introduction

The purpose of this article is to extend our knowledge on e-learning in three ways. First, this study broadens one of the most widely used behavioral models, technology acceptance model (TAM). In doing so, we combine qualitative and quantitative methods to seek confirmation as well as justification of the TAM extension. We believe that this combined methodology improves the study's validity and implications. Second, it also aims to examine the moderating effect of gender. Gender effects in new technology acceptance in a TAM context have been explored in information systems literature (e.g., Carr, 2005; Venkatesh & Morris, 2000), but the moderating role of gender in open and/or distance learning is still an understudied topic (Ong & Lai, 2006). Despite its importance in computer-mediated environments, educational literature seems to lack sufficient evidence in this regard. This study tries to fill this research gap. Third, the data collection takes place in one of the most emerging markets: Brazil. Brazil is considered one of the rising economic powers, as part of BRIC (Brazil, Russia, India, and China). Nonetheless, educational research on Brazilian higher education has still been scarce. Our review of literature on e-learning found three studies that examine computer adoption in Brazilian elementary schools (D'Assumpção-Castro & Alves, 2007; Fidalgo-Neto et al., 2009; Martins, Steil, & Todesco, 2004), while no research has been published on Brazilian university distance learning adoption. Thus, there is a clear lacuna in our knowledge of this field in this country. While the mere scarcity of published research may not necessarily make it worth investigating, we believe that both theoretical (TAM and gender) and practical (emerging market) justifications would not only justify the scholarly value, but also grant this research a unique position in the literature.

This study is organized as follows: We first explain TAM and gender as primary theoretical tenets. Then, we attempt to extend TAM based on a qualitative study, which leads to our formal hypotheses and research question. Next, we describe the methodology in detail and report the results of model validation. In closing, some important limitations are recognized, while concluding remarks are explicated. The article closely follows this structure.

### Technology Acceptance Model (TAM)

Technology acceptance model (TAM) is one of the most widely used behavioral models. It was specifically developed to predict individual adoption and use of new information technology or information systems (Davis, 1989). TAM uses theory of reasoned action (TRA) as a theoretical basis, but replaces many of TRA's attitude measures with two technology acceptance measures, ease of use (EOU) and perceived usefulness (PU). The central idea underlying TAM is that it is EOU and PU, not attitude, that ultimately determine a person's behavioral intention to use an IT (Davis, Bagozzi, & Warshaw, 1989). PU refers to the extent to which a prospective user believes that using a specific IT will improve his or her job performance, while EOU refers to the extent to which a user expects the use of a specific IT to be relatively free of effort (Davis, 1989). Because effort is a finite resource that a person may allocate to the various activities for which he or she is responsible (Radner & Rothschild, 1975), TAM posits that, all else being equal, an application that is perceived to be easier to use than another is more likely to be accepted by the user. In TAM, PU is seen as being directly impacted by EOU, with intention to use serving as a mediator of actual system use (Figure 1) (Davis, 1989).

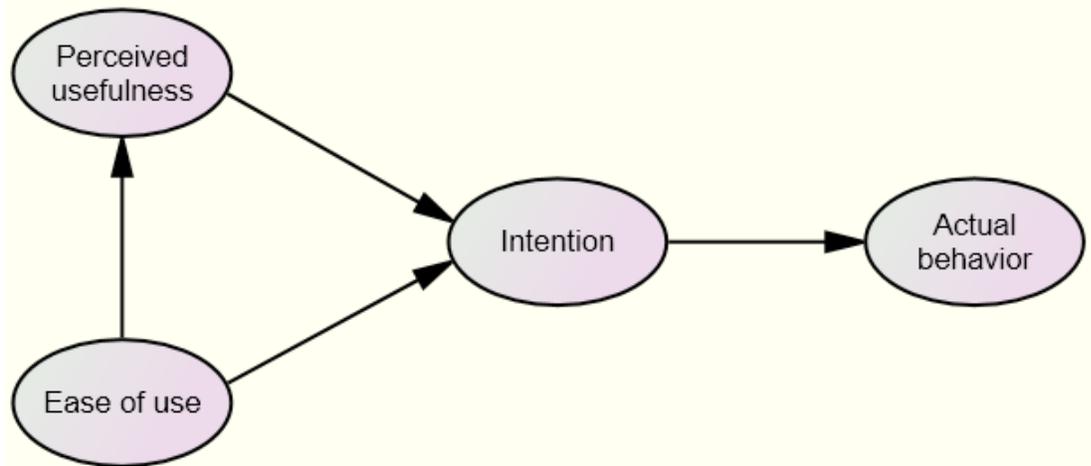


Figure 1. Technology acceptance model (TAM) (Source: Davis et al., 1989).

TAM has received extensive empirical support through validations, applications, and replications across a diverse range of information technology, including the mobile device (e.g., Bruner & Kumar, 2005; Luarn & Lin, 2005; Wu & Wang, 2005). As a result, it is reported that TAM consistently explains approximately 40% of the variance in individuals' intention to use an IT and actual usage (Venkatesh & Davis, 2000).

In general, attempts to extend the TAM have taken one of three approaches: introducing factors from related models, introducing additional or alternative belief factors, and examining antecedents and moderators of PU and perceived EOU (Wixom & Todd, 2005). For example, Doll et al. (1998) argued that the TAM should include the influence of social/personal factors. Other scholars suggested integrating contingency variables into the TAM framework, including human factors, emotional factors, and social influence factors. Venkatesh and Davis (2000) maintained that research to date had not studied how perceived playfulness fits into the nomological network of TAM. Venkatesh and Morris (2000) viewed anxiety as a determinant of process expectancy, such as perceived EOU. Other scholars have proposed that perceived computer playfulness and anxiety have significant effects on perceived EOU. Lu et al. (2003) proposed social influence to predict PU toward wireless Internet via mobile devices (WIMT) and concluded that social influence can promote and facilitate the acceptance of using WIMT.

In a context of online gaming adoption, Hsu and Lu (2004) added social influence and flow experience, which are conceptualized as antecedents of both attitude and intention. They found perceived EOU to be the most important determinant of attitude, but PU plays a minor role in this regard. In addition to flow experience, Ha et al. (2007) incorporated perceived enjoyment, perceived attractiveness, and perceived lower sacrifice as antecedents of attitude. Their findings show that the effect of perceived enjoyment is the most solid, while PU has no impact on attitude formation in a context of online gaming.

## Role of Gender in Consumer Behavior

Gender differences have been explored across a diverse range of social science disciplines, including the computer-mediated environment. It appears that much research “has consistently demonstrated that gender inequalities define professional and scholarly electronic communication and that men are over-represented in electronic communities” (Sierpe, 2005, p. 131). However, gender differences in e-learning remain largely understudied.

From a theoretical point of view, gender is often used as a part of the social and cultural meanings associated with developing a marketing strategy because the male-female dichotomy is the most fundamental dichotomy in society (Prakash & Flores, 1985). Moreover, we are expected to have learned gender roles since childhood. Boys and girls are expected to acquire not only sex-specific skills, but also sex-specific self-concepts and personality attributes, which enable them to feel masculine or feminine, as defined by a given culture (Barry, Bacon, & Child, 1957).

Gender schema theory posits that consumer behavior is a result of gender-based schematic processing (Bem, 1981). A schema is a cognitive structure that organizes and guides one’s perception. A schema-based explanation of consumer response suggests that information about the gender and the event are accessed from memory. After comparison with the schema, the new information is encoded and assimilated into gender-linked associations that itemize appropriate gender-based behaviors. These behaviors become a gender schema against which individuals evaluate their own behaviors in order to regulate their attitudes and behaviors (Bem, 1981). According to this theory, male schemas are associated with success and achievement to a higher degree than female schemas (Firat & Dholakia, 1998).

Self-construal theory explains that gender-based information processing differences result from one’s self-system, or self-construal. According to this theory, women view themselves as interdependent with others (interdependent self-construal) and thus tend to focus on establishing and maintaining relationships with people and social contexts. In contrast, men view themselves as independent of others (independent self-construal) and tend to have more individualistic goals. In addition, men are less concerned with belongingness or affiliation, thus concerns about society, family, and other people are secondary for men. Other streams of research indicate biological differences in the brain scheme. Meyers-Levy (1999) argues that females are likely to rely on left-hemisphere processing, which concerns the specificities and intricacies represented by stimulus information, thus they will eventually seek emotional benefits. In this respect, Phillip and Suri (2004) found that American women are more emotionally attached to their possessions than males and are more likely than men to favorably perceive promotional e-mails that include hypertext links for additional information.

## Model Extension

For a successful model extension, a study must achieve two essential goals: (1) confirmation of the construct adequacy, and (2) identification of additional constructs. To this end, we conducted in-depth interviews with 63 professors who work at three Brazilian universi-

ties. One of the researchers contacted the candidates by e-mail, requesting their participation in the study. A brief summary of the study objectives and background was provided. Candidates were told that the content of the interviews would only be used for academic purposes and their complete anonymity was guaranteed. Also, they were informed that they could obtain a summary of the study upon its completion. When candidates agreed to the interviews, appointments were scheduled by e-mail. Interviews were conducted in their workplace with an average duration of 58 minutes.

Open-ended questions were employed to encourage a detailed, but flexible discussion of the topics. Each time an interview was completed, transcripts were generated and coded in light of two main objectives: (1) confirmation of the TAM constructs and (2) identification of potential factors. During the coding, we conducted a detailed, line-by-line analysis to generate initial conceptual categories and to suggest relationships among categories (Charmaz, 2006). The results were constantly compared to make sure that interviewees' responses were synthesized into the most significant and frequent categories. We continued this process, interviews, coding, and constant comparison, until we reached a point where new interviews no longer sparked new insights (Charmaz, 2006).

As a result of this qualitative study, we did confirm that all TAM constructs were relevant in e-learning adoption. At the same time, we found two additional dimensions that need to be complemented: social interaction and attitude. Here, social interaction reflects an expectation that e-learning systems would increase close interactions among peers and faculty members. Many respondents pointed out that one of the most important benefits in e-learning adoption is to gain a greater level of interaction with their students and peers. In addition, affective feeling, "liking," was undeniably important because the respondents tended to associate their adoptive behavior with not only cognitive (e.g., teaching efficiency, knowledge sharing) but also emotional (e.g., positive affect, motivation, shared enjoyment) consequences. Davis et al.'s (1989) original TAM did include attitude as an antecedent of behavioral intention, although it was deleted due to its insignificant effect in their empirical study. In our case, we decided to include attitude because there was sufficient evidence that affective feeling is a good reason to drive intention.

## Hypotheses and Research Question

Our proposed model is shown in Figure 2. Our H1 and H2 posit that attitude is induced by EOU and PU, respectively. In turn, H3 contemplates a causal relationship between EOU and PU in that the former determines the latter. These relationships have been widely documented in the TAM literature (e.g., Bruner & Kumar, 2005; Lu et al., 2003; Luarn & Lin, 2005). By the same token, prior research on attitudinal model suggests that attitude is hypothesized to drive behavioral intention (Ajzen, 1991), while, in light of Davis et al. (1989), PU is a direct determinant of intention, which in turn determines actual behavior. Thus:

H1: EOU directly and significantly affects attitude.

H2: PU directly and significantly affects attitude.

H3: EOU directly and significantly affects PU.

H4: Attitude directly and significantly affects intention.

H5: PU directly and significantly affects intention.

H6: Intention directly and significantly affects actual behavior.

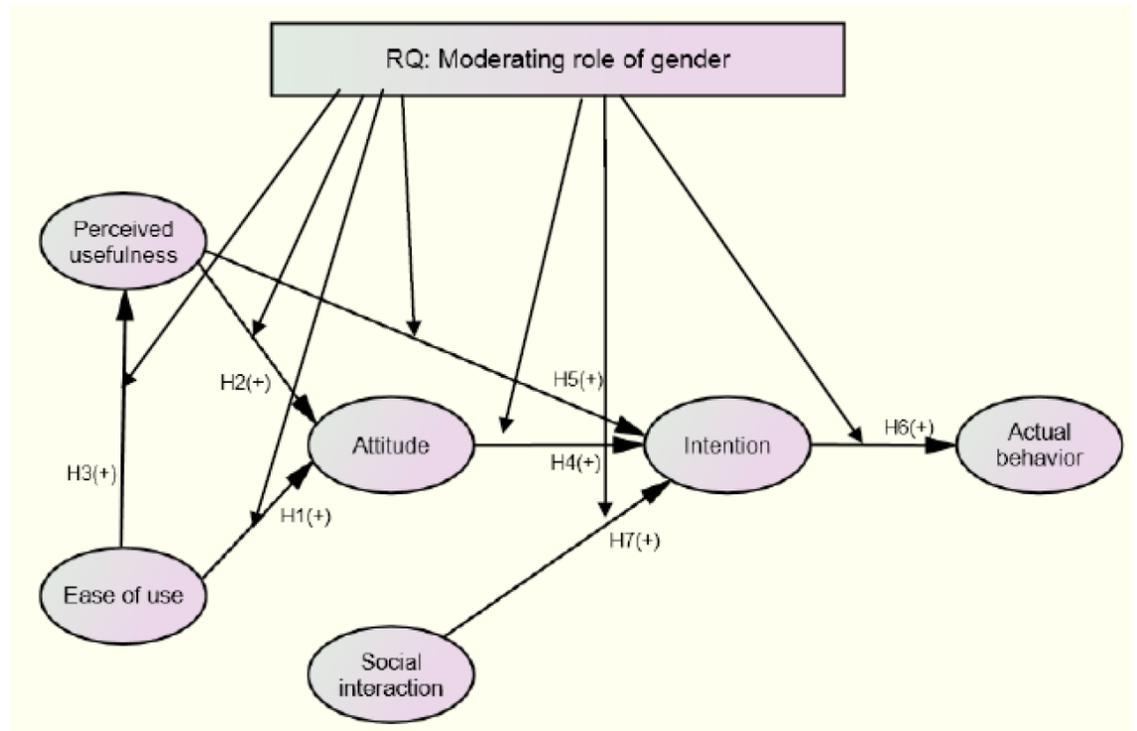


Figure 2. Proposed model.

We posit that social interaction could be an important driver of intention for two reasons. Prior research on electronic word-of-mouth indicates that people's sense of belonging is one of the most fundamental motivations to participate in information exchange behavior (Hennig-Thurau & Walsh, 2004). Second, Algesheimer, Dholakia, and Herrmann (2005) suggest that members of a brand community are actively engaged in social interaction building within the network. Therefore:

H7: Social interaction directly and significantly affects intention.

Finally, in light of the gender-related theories reviewed above, this study attempts to address the moderating effect of gender in e-learning adoption. Due to the complexity and a lack of empirical evidence on gender and e-learning, we formulate a research question instead of formal hypotheses:

RQ: How does gender moderate the relationships among the proposed constructs of the model?

In the next section, we describe the methodology used in the study in detail.

## Methodology

The proposed model was tested and validated by an empirical survey. We collected data from consumers in Brazil, in which the e-learning penetration has been on the rise. A convenient sample was used in three large Brazilian universities. In total, 600 faculty members, both part-time as well as full-time members, were approached by e-mail and invited to participate in the web-based survey. In total, 468 respondents completed the questionnaire. Twenty-two responses were incomplete and 446 responses were thus usable. Therefore, the effective response rate was 74%.

The survey instrument consisted of three parts. The first part included gender, position, university teaching experience, e-learning usage experience (Moodle, TelEduc, or in-house systems), and PC usage experience, among others. The second part explained the purpose of the study to the respondents then started the questions associated with the main constructs of the proposed model. All the constructs were measured by multiple-item, seven-point scales from “not at all” (1) to “very much” (7), with “neutral/cannot answer” (4) as an anchoring point. The majority of the items were adapted from prior e-commerce and e-learning research (see Table 1; Premkumar & Bhattacharjee, 2008; Liao, Chen, & Yen, 2007; Richardson & Swan, 2003; Taylor & Todd, 1995), while actual behavior was measured by a mean value of four relevant usage frequencies. When the original items were translated from English to Portuguese, translation-backtranslation was conducted in an attempt to ensure semantic equivalence (Craig & Douglas, 2005). The wording of the translated items was then discussed and evaluated by a panel consisting of two bilingual researchers.

### Measurement Model Evaluation

To examine the direct links between the constructs depicted in our proposed model, we followed the two-step approach of Anderson and Gerbing (1988). In this approach, the estimation of a CFA precedes the simultaneous estimation of the measurement and structural models. A CFA was built with 13 latent constructs and a total of 45 variables with AMOS 18.0. All items loaded onto the corresponding constructs with a high level of coefficients whose *t*-values were all statistically significant at  $p < 0.001$ . As in the pretest, multiple indexes were used to assess the goodness of fit of the overall model. The CFA produced the following results:  $\chi^2 = 310.31$  ( $df = 155$ ), CFI = 0.98, IFI = 0.98, TLI = 0.97, and RMSEA = 0.047.

The construct validity was assessed using CR. As shown in Table 1, the scores for all the constructs exceeded a threshold point, 0.70, which is a minimum recommended by prior research. An even more stringent criterion is the average variance extracted (AVE). Hair et al. (2006) suggest that a reliable construct should meet at least 0.50. All constructs met this criterion, except actual behavior (0.43). Overall, we therefore deemed the convergent validity to be satisfactory.

Table 1

*Confirmatory Factor Analysis Results*

Constructs	Items	$\beta$	CR	AVE
EOU (Premkumar & Bhat-tacherjee, 2008)	Learning to use e-learning is easy for me.	0.84	0.94	0.73
	My interaction with e-learning is clear and understandable.	0.94		
	Overall I believe e-learning would be easy to use.	0.74		
PU (Liao et al., 2007)	Using e-learning improves my performance in my teaching.	0.93	0.96	0.86
	Using e-learning improves my productivity in my teaching.	0.94		
	I find e-learning to be useful in my teaching.	0.95		
Social interaction (Richardson & Swan, 2003)	I felt comfortable conversing through this medium.	0.96	0.94	0.64
	I felt comfortable introducing myself in this course.	0.88		
	I felt comfortable participating in course discussions.	0.52		
	I felt comfortable interacting with other participants in the course.	0.93		
Attitude (Taylor & Todd, 1995)	Using e-learning is a good idea.	0.90	0.97	0.76
	Using e-learning would be pleasant.	0.94		
	I like the idea of using e-learning.	0.80		
Intention (Liaw et al., 2007)	I intend to use e-learning to assist my teaching.	0.82	0.94	0.55
	I intend to use online instruction to assist my teaching.	0.65		
	I intend to recommend the e-learning system to my colleagues.	0.76		
Actual behavior (original items)	I have used Moodle for (number of years).	0.67	0.90	0.43
	I have used TelEduc for (number of years).	0.69		
	I have used other e-learning systems for (number of years).	0.60		

Note:  $\beta$  = Standardized beta; CR = Composite reliability; AVE = Average variance extracted.

Next, with two constructs being sufficiently and psychometrically distinct, the square root of AVE of one construct should be greater than the construct-to-construct correlation between the two. This criterion was met for all the combinations, thus the discriminant validity of the measurement model was satisfied.

## Results

### Hypotheses Testing

The structural paths on the hypothesized relationships between the proposed constructs were examined for the full sample with maximum likelihood method using AMOS 18.0. Most of the indexes indicate an adequate model fit:  $\chi^2 = 460.94$  ( $df = 162$ ), CFI = 0.96, IFI = 0.96, TLI = 0.95, and RMSEA = 0.064. Therefore, it was judged that the multiple indexes sufficiently justify the adequacy of the model's fit to the sample data.

The structural model results are shown in Table 2. In our H1 and H2, we posit that EOU and PU determine attitude, respectively. Our results indicate that both paths are statistically significant. But the path from perceived usefulness to attitude (standardized  $\beta = 0.58$ ) is much stronger than that from ease of use to attitude (standardized  $\beta = 0.16$ ). Thus, both H1 and H2 were supported.

Table 2

#### Structural Model Results

Hypothesized paths			$\beta$	SE	$p$
H1: EOU	→	Attitude	0.16	0.05	**
H2: PU	→	Attitude	0.58	0.04	***
H3: EOU	→	PU	0.61	0.05	***
H4: Attitude	→	Intention	0.84	0.05	***
H5: PU	→	Intention	0.03	0.03	n.s.
H6: Intention	→	Actual behavior	0.23	1.00	***
H7: Social interaction	→	Intention	0.15	0.02	***

Note:  $\beta$  = Standardized beta; SE = Standard error. \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ , n.s. = non-significant.

In H3, we contemplate the causal relationship between ease of use and perceived usefulness. According to our structural model, this rang true with high standardized  $\beta$  (0.61). Thus, H3 was supported. By the same token, H4, which predicts a positive and direct relationship between attitude and intention, received support from our data (standardized  $\beta = 0.84$ ).

H5 posits that perceived usefulness directly determines intention, as was proposed in the original TAM. Nonetheless, our results indicate the contrary because this path was not statistically significant. Therefore, H5 was rejected.

In H6, as much research on behavioral theory indicates, intention is proposed to be an antecedent of actual behavior. This path was strong and statistically significant, supporting H6.

Finally, H7 states that social interaction is a significant predictor of intention. Our results echo this proposition, even though its standardized  $\beta$  is somewhat modest (0.15).

## Research Question

Next, in order to address our RQ, we performed a moderation analysis for gender. To this end, we first ran a multigroup CFA to check invariant structures between the two models: male and female respondents. The chi-square difference in measurement weights between the two models was not statistically significant ( $p = 0.26$ ), thus proving that the model works invariantly for the male and female respondents.

Based on the invariance structures, we performed a multigroup structural model analysis. In light of Bagozzi and Yi (1998), individual estimations of the baseline model were carried out for each model. The fit indexes suggest a good fit for both models with all the structural parameters being significant at  $p < 0.05$ , except one between PU and intention. On this basis, a multigroup structural model analysis was carried out with AMOS 18.0. Following Bagozzi and Yi (1998), the multigroup baseline model was estimated with the male and female respondents simultaneously, without placing any equality constraints on the hypothesized paths. Their fit indexes serve as initial comparison points in addressing whether the proposed structural relationships would hold in the same way across the three cluster groups. Next, in the constrained model, equality constraints were specified on all the structural paths. The difference in the chi-square values between the constrained and unconstrained models was calculated and tested by  $t$ -values with a statistical significance at  $p < 0.01$ . Table 3 shows the results. As seen clearly, there are three paths whose differences between the male and female models were statistically significant: (1) EOU  $\rightarrow$  PU; (2) PU  $\rightarrow$  attitude, and (3) intention  $\rightarrow$  actual behavior.

Table 3

### Moderation Analysis Results

Hypothesized paths			Males		Females		$p$
			$\beta$	SE	$\beta$	SE	
EOU	$\rightarrow$	Attitude	0.20	0.08	0.13	0.07	n.s.
PU	$\rightarrow$	Attitude	0.61	0.08	0.53	0.05	*
EOU	$\rightarrow$	PU	0.69	0.09	0.55	0.06	*
Attitude	$\rightarrow$	Intention	0.85	0.07	0.85	0.06	n.s.
PU	$\rightarrow$	Intention	0.05	0.04	-0.01	0.03	n.s.
Intention	$\rightarrow$	Actual behavior	0.28	0.81	0.24	1.94	*
Social interaction	$\rightarrow$	Intention	0.10	0.08	0.18	0.07	n.s.

Note:  $\beta$  = Standardized beta; SE = Standard error. \*  $p < 0.05$ , n.s. = nonsignificant.

## Limitations

As is always the case, this research suffers from a few limitations, which we must recognize for our objectivity. First, our sample was a convenient sample who volunteered to participate in the survey. Thus, any generalization based on this study should be treated with caution. Moreover, our sample consisted of faculty members teaching in private universities. However, important differences are said to exist between public and private institutions in Brazil, which this research does not take into account. Thus, future research would benefit from interviews of public academic institutions' staff to paint a complete picture of the acceptance of e-learning in Brazilian higher education institutions. Second, the moderation hypotheses are not exclusive to the three variables (gender, professional category, and usage experience) we proposed. Other relevant factors, such as personal experience and propensity of Internet usage, educational background, and age, may influence the relationships among the constructs. In particular, it will be interesting to examine a relationship between e-learning adoption and computer self-efficacy, which would further improve the validity of the study.

## Conclusions

This study extends TAM through the addition of attitude and social interaction and examines e-learning adoption in Brazil. Our key interest lies in the question of how gender affects the hypothesized relationships among the constructs.

Our findings suggest that the extended TAM fits our data fairly well, but the relationship between perceived usefulness and intention was negligible. This departs from the original propositions made by Davis et al. (1989) who contemplate the direct influence of perceived usefulness on intention. At the same time, our extended model recaptures the importance of attitude, which was determined to be irrelevant in the original TAM. In particular, our structural equation modeling results suggest that perceived usefulness is a stronger predictor of attitude compared with ease of use.

Second, the extension of TAM, which closely follows the original model, provides additional evidence of TAM's explanatory power. This model has been replicated in different countries. Our study proves that this model could be safely extended and replicated in a Latin American context. In our study, the rigorous translation-backtranslation process was adopted, which must have increased the semantic equivalence of the construct items. In this light, future research should apply or adapt the present model in other Latin American countries where e-learning adoption becomes a key issue in higher education markets.

Third, our moderation analysis reveals that gender does affect some of the causal relationships. In particular, our results indicate that male respondents perceived the path from perceived usefulness to attitude much more strongly compared with their female counterparts. This is also the case for the path from ease of use to perceived usefulness. These results seem consistent with prior research that found (1) females' greater reliance on ease of use due to their lower level of computer literacy and (2) males' greater emphasis on perceived

usefulness in determining behavioral intention (e.g., Carr, 2005; Ong & Lai, 2006; Venkatesh & Morris, 2000; Yuen & Ma, 2002). In addition, perhaps females are more prone to seek reasons to gain emotional, rather than rational, benefits (i.e., attitude). It seems that both ease of use and perceived usefulness are the specificities and intricacies represented by stimulus information because, as Meyers-Levy (1989) argues, females are likely to rely on left-hemisphere processing. On the other hand, males are more consistent in terms of the intention → actual behavior link, while females are less likely to make behavioral decisions in terms of e-learning adoption.

Our research results provide some practical implications that would assist the development of e-learning methods in higher education institutions in Brazil. A fact that social interaction directly and significantly affects intention among both males and females suggests that social networking sites could be a useful tool to exchange information among faculty members. In fact, the use of Facebook or LinkedIn has become increasingly popular among higher education faculty. According to a recent survey, nearly 85% of faculty have a Facebook account, two-thirds are on LinkedIn, and 50% are on Twitter (Wakefield, 2012).

Furthermore, Academia.edu, one of a growing number of networking sites designed specifically for scholars, has attracted 1.2 million registered users, where users are engaged in organizing their research, creating personal profiles, and searching for people with similar scholarly interests (*The Chronicle of Higher Education*, 2012). With these tools, universities could stimulate or encourage motivations to use e-learning by explicating its usefulness as well as ease of use. In this regard, females may be more attracted by social network-based web activities compared with males (Barnett, 2012), although our moderation results indicate no significant difference on the path from social interaction to intention. This issue on the use of social networking sites, gender, and e-learning diffusion may be an interesting topic to explore in the future.

## Acknowledgement

The authors appreciatively acknowledge the financial support provided by a grant from the Spanish Ministry of Science and Innovation (National Plan for Research, Development and Innovation ECO2011-30105) for preparing this article.

## References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211.
- Algesheimer, R., Dholakia, U. M., & Herrmann, A. (2005). The social influence of brand community: Evidence from European car clubs. *Journal of Marketing*, 69(7), 19–34.
- Anderson, J.C., & Gerbing, D.W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, 103, 411–423.
- Bagozzi, R.P., & Yi, Y. (1998). On evaluation of structural equations models. *Journal of the Academy of Marketing Science*, 16(1), 74–94.
- Barnett, E. (2012, June 26). Women ‘more attracted to social networking sites’. *Independent.ie*. Retrieved from <http://www.independent.ie/business/technology/women-more-attracted-to-social-networking-sites-3150898.html>.
- Barry, H., Bacon, M.K., & Child, I.L. (1957). A cross-cultural survey of some sex differences in socialization. *Journal of Abnormal and Social Psychology*, 55, 327–332.
- Bem, S.L. (1981). Gender scheme theory: A cognitive account of sex typing. *Psychological Review*, 88, 354–364.
- Bruner, G.C., & Kumar, A. (2005). Explaining consumer acceptance of handheld Internet devices. *Journal of Business Research*, 58(5), 553–558.
- Carr, D. (2005). Contexts, gaming pleasures, and gendered preferences. *Simulation & Gaming*, 36(4), 464–482.
- Charmaz, K (2006). *Constructing grounded theory: A practical guide through qualitative analysis*. Sage Publication: London.
- Craig, C.S., & Douglas, S.P. (2005). *International marketing research* (3<sup>rd</sup> ed.). New York: John Wiley and Sons.
- D’Assumpção-Castro, M.F., & Alves, L.A. (2007). The implementation and use of computers in education in Brazil: Niterói city/Rio de Janeiro. *Computers & Education*, 49(4), 1378–1386.
- Davis, F.D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319–339.
- Davis, F.D., Bagozzi, R.P., & Warshaw, P.R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, 35(8), 982–1003.

- Doll, W.J., Hendrickson, A., & Xiandong, D. (1998). Using Davis's perceived usefulness and ease-of-use instruments for decision making: A confirmatory and multi-group invariance analysis. *Decision Science*, 29(4), 839-870.
- Fidalgo-Neto, A.A., Tornaghi, A.J.C., Meirelles, R.M.S., Berçot, F.F., Xavier, L.L., Castro, M.F.A., & Alves, L.A. (2009). The use of computers in Brazilian primary and secondary schools. *Computers & Education*, 53(3), 677-685.
- Firat, A.F., & Dholakia, N. (1998). The making of the consumer. In A. F. Firat & N. Dholakia (Eds.), *Consuming people: From political economy to theaters of consumption* (pp. 13-20). London, UK: Routledge.
- Ha, I., Yoon, Y. & Choi, M (2007). Determinants of adoption of mobile games under mobile broadband wireless access environment. *Information & Management*, 44(3), 276-286.
- Hair, J.F., Black, B., Babin, B., Anderson, R.E., & Tatham, R.L. (2006). *Multivariate data analysis* (6<sup>th</sup> ed.). Upper Saddle River, NJ: Prentice Hall.
- Hennig-Thurau, T. & Walsh, G. (2004). Electronic word-of-mouth: Motives for and consequences of reading customer articulations on the Internet. *International Journal of Electronic Commerce*, 8(2), 51-74.
- Hsu, C.L., & Lu, H.P. (2004). Why do people play on-line games? An extended TAM with social influences and flow experience. *Information & Management*, 41(7), 853-868.
- Liao, C., Chen, J. L., & Yen, D. C. (2007). Theory of planning behavior (TPB) and customer satisfaction in the continued use of e-service: An integrated model. *Computers in Human Behavior*, 23, 2804-2821.
- Liaw, S. S., Huang, H. M., & Chen, G. D. (2007). Surveying instructor and learner attitudes toward e-learning. *Computers & Education*, 49, 1066-1079.
- Lu, J., Yuk, C.S., Liu, C., & Yao, J.E. (2003). Technology acceptance model for wireless Internet. *Internet Research: Electronic Networking Applications and Policy*, 13(3), 206-222.
- Luarn, P., & Li, H.H. (2005). Toward an understanding of the behavioral intention to use mobile banking. *Computers in Human Behavior*, 21(6), 873-891.
- Martins, C.B.M.J., Steil, A.V., & Todesco, J.L. (2004). Factors influencing the adoption of the Internet as a teaching tool at foreign language schools. *Computers & Education*, 42(4), 353-374.
- Meyers-Levy, J. (1989). Gender differences in information processing: A selectivity inter-

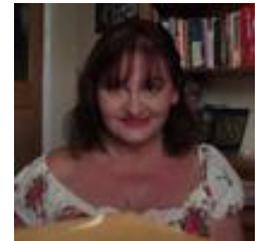
- pretation. In P. Cafferata & A.M. Tybout (Eds.), *Cognitive and affective responses to advertising*. Lexington, MA: Lexington.
- Ong, C.S., & Lai, J.Y. (2006). Gender differences in perceptions and relationships among dominants of e-learning acceptance. *Computers in Human Behavior*, 22(5), 816–829.
- Phillip, M.V., & R. Suri (2004). Impact of gender differences on the evaluation of promotional emails. *Journal of Advertising Research*, 44, 360–368.
- Prakash, V., & Flores, R.C. (1985). A study of psychological gender differences: Applications for advertising format. In E.C. Hirschman & M.B. Holbrook (Eds.), *Advances in consumer research* (pp. 231–237). Provo, UT: Association for Consumer Research.
- Premkumar, G., & Bhattacharjee, A. (2008). Explaining information technology usage: A test of competing models. *Omega*, 36, 64–75.
- Radner, R., & Rothschild, M. (1975). On the allocation of effort. *Journal of Economic Theory*, 10, 358–376.
- Richardson, J. C., & Swan, K. (2003). Examining social presence in on line course in relation to students perceived learning and satisfaction. *Journal of Asynchronous Learning Networks*, 7(1), 68–88.
- Sierpe, E. (2005). Gender distinctiveness, communicative competence, and the problem of gender judgments in computer-mediated communication. *Computers in Human Behavior*, 21(1), 127–145.
- Taylor, S., & Todd, P. A. (1995). Understanding information technology usage: A test of competing models. *Information Systems Research*, 6(2), 144–176.
- The Chronicle of Higher Education* (2012, April 29). Social networks for academics proliferate, despite some doubts. Retrieved from <http://chronicle.com/article/Social-Networks-for-Academics/131726/>.
- Venkatesh, V., & Davis, F.D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science*, 46(2), 186–204.
- Venkatesh, V., & Morris, M.G. (2000). Why don't men ever stop to ask for directions? Gender, social influence, and their role in technology acceptance and usage behavior. *MIS Quarterly*, 24(1), 115–139.
- Wakefield, K. (2012, February 27). Should professors use Facebook to communicate with students? *Faculty Focus*. Retrieved from <http://www.facultyfocus.com/articles/trends-in-higher-education/should-professors-use-facebook-to-communicate-with-students/>

- Wixom, B. H., & Todd, P. A. (2005). A theoretical integration of user satisfaction and technology acceptance. *Information Systems Research*, 16(1), 85-102.
- Wu, J.H., & Wang, S.C. (2005). What drives mobile commerce? An empirical evaluation of the revised technology acceptance model. *Information & Management*, 42(5), 719-729.
- Yuen, A.H.K., & Ma, W.W.K. (2002). Gender differences in teacher computer acceptance. *Journal of Technology and Teacher Education*, 10(3), 365-382.

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# Who am I and What Keeps Me Going? Profiling the Distance Learning Student in Higher Education



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## Abstract

Student retention and progression has exercised the higher education (HE) sector for some time now, and there has been much research into the reasons why students drop out of higher education courses (Allen, 2006; Buglear, 2009). More recently the Higher Education Academy Grants Programme Briefing (HEFCE, 2010) outlined a number of areas that emergent project data revealed as being important to both the retention and progression of students, including areas outlined by a number of researchers as being essential to student success: expectations, support, feedback, and involvement. But there has been less research, particularly within the distance learning sector, into factors that encourage students to stay (O'Brien, 2002). This small scale qualitative project using feminist qualitative research methods and based in the Open University, UK builds upon an intensive institutional research project analyzing what type of interventions make a positive difference to student progression and success. The research revealed insights into factors linked to the expectations, identities, and support of students which proved influential in terms of their resilience and motivation to remain on course.

**Keywords:** Student retention; student progression; distance universities; online identity; forum moderation; online teaching; online support; student identity

## Background

Student retention and progression has exercised the higher education sector for some time now and there has been much research into the reasons why student drop out of courses<sup>1</sup> (Fitzgibbon, 2006; Johnson, et al., 2004; Simpson, 2002; Tinto, 2009). More recently the Higher Education Academy Retention Grants Programme Briefing (HEFCE, 2010) outlined a number of areas that emergent project data revealed to be useful in adding to both retention and progression and include areas highlighted by a number of researchers as being essential to student success: expectations, support, feedback, and involvement (Schofield et al., 2010; Tinto, 2009; Yorke, 1999, 2004). The Open University, like many organisations, is rationalizing its provision in order to create an optimum student experience for the part-time distance learner; as part of this, it is changing its emphasis from a modular<sup>2</sup> based approach (although this will still be available) to one with an emphasis on qualification pathways, moving the learner from a level one qualification through to full degree or diploma. Internationally many campus-based UK and international HE institutions are broadening their online offerings in order to provide more flexible and cost-effective ways in which students may engage with higher education. Research into what motivates distance learners and what encourages them to move from a level one to level three at undergraduate level has relevance for campus-based universities as well as those which have been engaging with online provision for some time (Stryker & Serpe, 1994).

Work done by the UK Higher Education Academy Retention Grants Briefing Programme, (HEA 2010) outlined a number of areas which analysis revealed to contribute most to student retention and progression. These include

1. building relationships to ease student transition to university and enhance the sense of belonging;
2. use of social networking tools such as Facebook to help social and academic integration;
3. forming early strong interpersonal relationships between staff, students and their peers;
4. working closely with students to identify how they can support each other to prosper and succeed at university;
5. reducing factors that make students doubt;
6. increasing factors that make students want to stay;
7. building communications between families and students.

Research into student retention and progression has intensified over the last 40 years. The character and nature of the research has evolved within this time, and recent reviews of the

<sup>1</sup> Courses used to denote an undergraduate qualification

<sup>2</sup> A module is an element of study contributing either 60 or 30 credits towards an undergraduate qualification.

literature in this area revealed key areas for action from both an institutional and sector-wide perspective (Fitzgibbon, 2006; Glogowska et al., 2007; Simpson, 2000; Tinto, 2000). Cross-sector literature in the area has identified not only future individual areas for research, but also a number of factors to be taken into consideration within any institution which hopes to make effective and quantifiable progress in the area of progression. A key challenge for institutions has been identified as the need for any progression programme to achieve centrality within that organisation, a particularly difficult area if this is not already a measure related to performance (Tinto, 1993, 2007). This has meant that for many institutions, while effective programmes to promote progression have been identified and to some extent implemented, the final outcome has had perceptibly less impact than it potentially may have done.

With 200,000 students, 7,000 associate lecturers, and some 65% of modules being offered online, The Open University has a wealth of experience and research on student retention upon which to draw. However recent figures reveal that a substantial number of students enrolling on level one modules fail to register on another module within a 12-month period. This reflects findings by other researchers within the field of distance education (Herbert, 2006; O'Brien, 2002), who note that distance courses have significantly higher dropout rates than those within campus-based universities (Moore et al., 2003). Frydenberg identifies three areas in which recent research into distance education has concentrated: individual characteristics, institutional support systems, and quality of interaction between representatives of the institution and the students (Frydenberg 2007), highlighting the latter as being key to student resilience and reflecting research also done by Simpson and Yorke (Simpson, 2000; Yorke, 1999). But other research in the field has noted that the interaction between the three areas above is more significant in terms of student identity and it is by investigating the interaction between the three elements which is most likely to yield a more holistic view of what is engendered in creation of a salient student identity: which motivational factors convince students to remain (Baxter et al., 2010; Herbert, 2006; Burke & Reitzes, 1991; Scanlon et al., 2007). Kanter (1968) articulates these three areas as three forms of commitment: instrumental commitment or material benefits of belonging to a community, affective commitment or the positive feelings of engaging with others in the community, and moral commitment or the evaluative orientations that provide individuals with a sense of self-worth. Burke and Reizes take this further by suggesting that the meld of the three areas identified by Frydenberg combined with the forms of commitment identified by Kanter produce an identity which is “not necessarily tied to a line of activity, but tied to maintaining reflected appraisals congruent with their identity standards” (Burke & Reitzes, 1991, p. 250), concluding that it is the level of commitment to the particular identity that indicates the degree to which levels of persistence and resilience will feature in the pursuit of a particular path.

This link between student motivation and resilience has been linked to student identity in a number of studies (Burke et al., 1981; Janks, 1999; Burke & Reitzes, 1991; Dutton, et al., 1994; Foote, 1951; Scanlon et al., 2007) and is seen as being intrinsically linked to feelings of effectiveness, acting as a key element in the retention and motivation of the individual

and linking strongly to performance and job satisfaction (Hotho, 2008; McAdams, 1997). Studies in professional and working identities identify that strong working identities are key to individuals' self-salience: the feeling that they are following the right path, enabling them to develop greater levels of professional resilience particularly during periods of difficulty (Baxter, 2010a, 2011; Reeve, 1992). Although student identities are not professional identities, they are working identities developed by the student to make sense of the environments within which they find themselves and subject to institutional discourses, biographical elements, and underlying personal belief systems (Joseph, 2002). They are also subject to hegemonic influences viewed from a critical realist perspective and which indicate the need for the researcher to "move beyond regularities, experiences and events and to study the underlying causal structures that provide ontological depth to identities" (Joseph, 2002; Bhaskar, 1989). To a certain extent, they are learned identities formed from a mix of personal biographies and interactions with communities within their personal and student lives (Lave et al., 1991b; Wenger, 1998), to be viewed as part of a trajectory of intersecting identities that revolve around culture, assumptions, socioeconomic background, gender, and language (Singh et al., 2006). In part they are modeled on others, yet are also uniquely individual (Edwards, 1996; Burke & Reitzes, 1991). Just as professional identities link to motivation and emotion and feelings of doing a good job, a strong and salient student identity links to the extent to which students are retained and progress within higher education.

The diagram below, adapted from work investigating professional identities (Baxter, 2010a; Baxter, 2011a), outlines a framework for analysis of student identities. For the purposes of this study it was used alongside an institutional framework, the student journey (Figure 2), in order to identify key motivational factors, factors which may begin by influencing the student to choose the distance route rather than a traditional campus-based course through to those which influenced their successful progression between the three levels of their undergraduate degree.

Much research carried out within the higher education sector, based within both distance learning and campus-based institutions, indicates that student retention and progression is based upon a complex mix of institutional, personal, and biographical factors. But at what point in the student journey are some factors more influential than others at influencing whether a student stays or drops out (Johnson, et al., 2004; Gardner, 2000; Jones, 2008; Yorke, 1999)? The student journey conceived within The Open University is used to track student progress at various stages within a student's career. In this study it has been used to pinpoint motivational factors influencing student progression at various stages during the student's engagement with the university. Student identities are considered in this paper to meld and interlink with personal identities, forming a trajectory in which they both complement and contrast one another, as Muir and Wetherell articulate:

In social science research, a distinction is sometimes made between the study of personal and social identities. In truth, this is a rather arbitrary distinction: identity is always both about ourselves and about how we are positioned in relation to the world. (2010, p. 4)

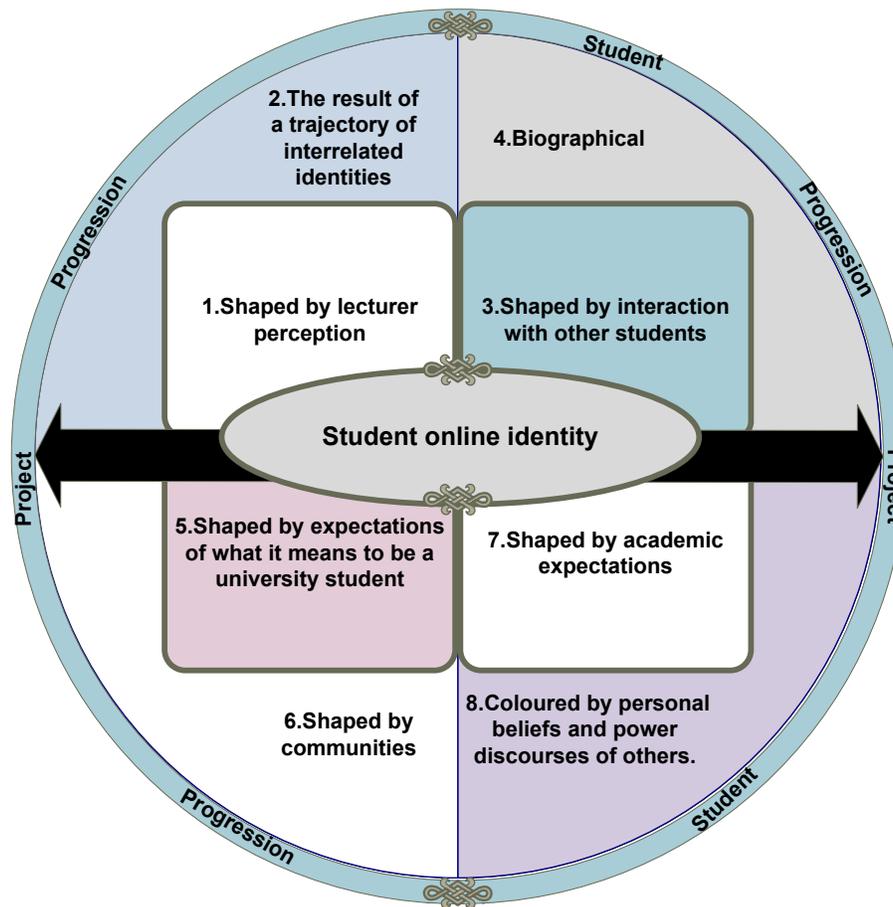


Figure 1. Factors shaping student identities adapted from Factors Shaping Online Identities (Baxter 2011a).

The factors contributing to motivation to progress were analysed according to elements comprising student identities, outlined in the diagram above. These were then mapped to the student journey.

Figure 1 offers a framework for student identity analysis and is based upon the framework for identity analysis in earlier work (Baxter, 2004); it also draws upon an extensive literature review into professional identities (Baxter 2011) and online identities in which student identities are seen to be composed of

1. lecturer perceptions;
2. the result of a trajectory of interrelated activities (Beijaard, 2004; Burke, et al., 1981);
3. interaction with others;
4. biographical elements (McAdams, 2006);

5. expectations of what it means to be a university student;
6. communities (Wenger, 1998);
7. academic expectations (including expectations of the organization) (Jones, 2008; Schofield, et al., 2010; Simpson, 2002); and are
8. coloured by personal beliefs emanating from cultural assumptions, childhood beliefs, language, and socioeconomic background.

Within this study the framework was used to analyse the transcripts and provide insights into student motivation and progression. This is discussed more fully in the following section.

## Methodology

The literature review pursued three lines of inquiry: literature on online retention, literature on retention in conventional higher education institutions, and literature on identity formation. It built on previous work on identity analysis, professional working identities, and student retention and progression (Baxter, 2011(a); Baxter, et al., 2010; Baxter, 2004). In terms of student retention the literature focused only on those studies which focused on affective, cognitive, and situative factors affecting retention and progression as these factors were outlined in previous work as important in the consideration of student identity.

For the reasons outlined above, the research follows a case study format (Yin, 1993), based in the Open University, UK. A series of 16 qualitative interviews were carried out, each lasting between 60 and 75 minutes. The interviews were carried out face to face in the homes of the respondents in order to create an environment in which participants felt comfortable and at ease speaking to the researcher (Elliot, 2005; Gorelick, 1991). Students were self-selecting and drawn from the sample ranges featured in Figure 1. The sample was approved by The University Student Research Panel and the categories chosen emanated from previous research in this area (Ashby, 2004; Baxter, et al., 2010; Johnson, et al., 2004; Jones, 2008; Leadiwood et al., 2003). Students were self-selecting and the study did not discriminate on grounds of gender. The research methodology used was based upon previous work into identity analysis and online working (Burke, et al., 1981), in which a feminist, postmodern phenomenological approach into identity analysis was taken (Langridge, 2007). The phenomenological approach has been used across the public sector to investigate the ways in which professional identities change and evolve according to the circumstances in which they are operating (Baldwin, 2008; Baxter, 2011b; Burke, et al., 1981) and has been found to be particularly useful in uncovering underlying beliefs which, in turn, underlie actions and behaviors. It is also employed by feminist researchers, placing the individual at the heart of their story; their identity is that reflected in their articulation of their own story (Josselson, 1987, 2007; Maclure, 1993). The data were analysed according to the framework in Figure 1 (discussed earlier). The self-selecting nature of the students may have given rise to a sample in which only those with very positive feelings towards the university were interviewed. The

study acknowledges that this may have unduly positively influenced their feelings towards institutional interventions aiding their resilience and motivation. However as the aim of the study was to provide insights into factors aiding progression, this was not thought to unduly affect the overall aims of the research. The study also encountered proportionally far more female respondents than males (in the proportion 60% to 40%) and the reader should consider the results in light of this gender bias. It also raises the question of whether future research should focus on the differences between male and female responses in light of the research questions in this study as some studies have begun to reveal interesting differences in this area (Fozdar & Kumar, 2007; Motiwalla & Tello, 2001).

Group	Description	Numbers
A	Students beginning study post 2004 and completing a qualification (without credit transfer) (aged 18-25)	2
B	Students beginning their study post 2004 and completing a qualification without credit transfer (aged 25+)	2
C	Students beginning their study post 2004 and taking more than 12 months out before completing their qualification	3
D	Students whose study goal has changed, from doing a single module to getting a qualification since November 2011.	3
E	Students from a large level 2 course who have progressed from level one to level 3.	3
F	Students from 2 widening participation initiatives.	3

*Figure 2.* Sample.

The sample, illustrated in Figure 2, was identified on the basis of the research carried out over the previous year, within which these groups of students were identified as having the potential to offer the most powerful insights into ways in which they had felt motivated to progress (Baxter, et al., 2010). The research formed part of an internal report for a university project on student progression in which statistical information combined with qualitative data gained from interviews with staff from regions, nations, and central academic

units was used in order to identify factors affecting student progression. Group A students were chosen due to the fact that the university is attracting a much younger student population than at other times in its history (Maclean, 2004). These students are of particular interest to the project. Group B students still represent the university's largest population distribution, and it was hoped that insights gained by speaking to these students would be helpful in identifying motivational factors within those looking to change career or direction due to unemployment or other factors. Group D students have moved from initially only registering to do a single module (very common within the Open University) to registering on a full qualification; the reasons why this should be so were of great interest to the project. Group E students were identified due to this being the area that is most problematic: the progression from level one to level two. This has also been identified within sector research as being a period in which student drop-out rates are high. Finally, group F students were taken from the Centre for Widening Participation in order to find out how their experiences and motivations compared to other students within the study.

Before the main phase of the study, an initial pilot study was carried out in order to refine questions and ensure that students were comfortable with such in-depth interviews (Brabeck et al., 2009; Holstein et al., 1995; Macfarlane, 2006). The questions were informed by previous research into progression within the Open University and the wider sector (Jones, 2008; Trowler, 2010; Yorke, 1999). Participants were also issued with a description and purpose of the research and an ethics statement, informing them of their right to withdraw at any time. The research design and ethics protocols were approved by the University's Student Research Panel.

The research aimed to find out what factors influence positive trends in progression and to gain insight into the differing journeys of successful students. The interviews were structured around the Open University Student Journey (illustrated below). This is a framework used by the university which tracks students as they progress through various stages of engagement with the university. The first element (o) considers how their previous study experience may influence their decision to study. Moving on from there the seven further stages of the journey take the student from awareness and consideration of study options available to the final stage of completing their qualification. The journey can be considered as part of a cycle leading students from foundation levels of study through to postgraduate level.

(o) Previous study experience	1.Awareness/exploration	2.Consideration	3.Decision
4.Orientation /preparation	5.Study	6.Transition	7.Completion

(Diagram adapted from The Student Journey)

The research questions were as follows:

1. In what ways have student expectations influenced student progression so far?

2. Which factors have had the most influence on student motivation to succeed?
3. Which university initiatives have had the most positive influence on student motivation to succeed?
4. Have students experienced any drawbacks to progression between modules and if so how did students overcome them?

In order to map comments against Figure 1, quotes are numbered with the corresponding element. In cases where quotes indicate the presence of more than one student identity element, they are illustrated with the corresponding numbers. For example the quote below is indicative of expectations of what it means to be distance university student (5) whilst also indicating that academic expectations were shaping this student's perception of self (7). The quote is marked numbers 5 and 7 which indicate the corresponding identity element illustrated in Figure 1.

I thought I'd be on my own, then I realised that for some assignments I would actually be working with other students, sort of like in a group. That was so different to what I thought this would be. (student group B) (5, 7)

## What Makes Students Progress

### In What Ways have Students' Expectations Influenced Student Progression So Far?

Prior to, or at the start of, Open University study, the data suggest that students have a limited understanding and limited expectations of how they will experience distance learning. They know that materials will be sent to them and that they will study them from home. But many other aspects of what the Open University provides come as something of a surprise.

I thought I'd be on my own, then I realised that for some assignments I would actually be working with other students, sort of like in a group. That was so different to what I thought this would be. (student group B) (5, 7)

In most cases the increased engagement with others proved a pleasant surprise, but some students revealed their inhibitions when communicating in this way:

I was prepared for online work but I find it difficult to like have a conversation with people online, especially when you can't see their faces. (student group F) (3, 6)

Insights into how this went on to affect their identity and progression reflected insecurities

at being able to portray their identities online.

I find that some people talk as if they know it all , on the forum, that puts me off sometimes, and I thought , (when I first started), am I going to be able to get on with this?  
(student group D)(8, 4, 3)

The impact of the tutor was very influential at this point in terms of convincing the student that it was worth investing time and energy into learning these new ways of working: becoming part of an academic community (Wenger, 1998).

Realistic student expectations that study will require time and that it will be necessary to reorder part of their lives in order to accommodate this were found to help a great deal during the early part of their study. After that, those who approached the work strategically appeared to gain confidence in their own abilities to cope with the workload.

In the times when I was busy what I used to do was to concentrate only on the assignments and do any extra bits after I had done the work which was going to be marked. Doing things this way, I felt I was getting ahead, I felt more in control. (student group D)(4, 5)

A clear sense of the difference between level one and level two study and realistic expectations on increased workload and autonomy proved to be important in enhancing feelings of self-efficacy and coping in the transition between levels one and two.

I could see what was available but after chatting with xxx (the tutor) we decided that I would be much better going for this module, she reminded me of what I'd done best in during my last module and that really helped. (student group E) (1, 5)

Expectations and beliefs about work and study roles have been found to be important in the retention of students and professionals. Initial expectations which are not well managed can lead to a sense of let-down and erosion of confidence and feelings of agency, which if not addressed lead rapidly to attrition (Duemer et al., 2002).

The insights within this section revealed elements of student identities which focused particularly upon initial expectations around student perceptions of distance study and the ways in which they felt that they would be able to cope with this mode of study. This related particularly to group work and the ways in which they were expected to engage with other students. Responses indicated that tutor intervention at key times during the student journey, particularly just prior to making the transition between levels one and two, were key to their progression. This was particularly true when tutors were able to address metacognitive elements of student learning, moving the students forward in their choice of module

using knowledge of their past performance, strengths, and weaknesses, able to challenge preconceptions and issues with confidence and student identity, and able to draw upon established counseling methods (Heron, 1999).

### Factors Influencing Motivation

The most influential factors appeared at all stages of the student journey and linked with all three areas mentioned earlier in Frydenberg's analysis (2007). The success of these students appeared as a combination of intrinsic determination to succeed, ability to create a home environment which supports study (as mentioned earlier), along with university interventions, particularly when carried out by regional support staff or tutors. Certain characteristics appeared to be influential in creation of robust student identities. In some cases these included positive past learning experiences which created a 'can do' feeling in relation to academic work. However this was not necessarily linked to outstanding academic results; in some cases students may only have scraped through past modules. The feelings of salience, a combination of confidence and agency, seemed to emanate from the differing ways in which their successes were viewed by fellow students, family, and tutors. They also understood clearly that however much help the Open University gave them, in the end they alone were responsible for whether they succeeded or not. This keys into literature that highlights the need for individuals to feel agentic in their progress in order to remain motivated and committed to their particular pathways (Baxter, 2011; Reynolds, 2007; Simpson, 2000; Tinto, 2009)

Study structures and the ways in which students ordered their lives around the need to study linked to both personal characteristics and strategies learned from interaction with other students and feelings of integration with student communities through online forums or other social networking applications outside of university control. They made time to study so that they rarely fell behind, ensuring that both friends and family were aware that study needed to come first. As such, study has become an integral part of their personal story and history, part of the way in which they define themselves (Giddens, 1991; Goodley, 2004). In terms of their identity there was evidence that study was in some cases going some way to changing their belief systems, engaging with several of the factors influencing identity in Figure 1 (and noted alongside the quotes which follow).

Increased confidence appeared in students both through success in passing modules, but also through meeting challenges such as taking exams for the first time after many years or writing essays in spite of dyslexia. This was particularly true in cases in which students experienced the type of support which may not have been experienced previously:

I did start another course at another university, but I found that with my writing issues, I just wasn't getting the help I needed from staff, so I registered here and found it was a whole different ballgame (student group A) (4,7,5, 6)

Positive feelings of independence and self-reliance flowing from successful distance learn-

ing study engendered a sense of resilience, a factor noted within sector research as being key to successful study and attainment of new student identity (Leadiwood, et al., 2003; Trowler, 2010; Yorke, 2004; Yorke et al., 2008)

Academic achievement also featured greatly in the responses: There was a notable pride within some students with regard to their ability to study at degree level, particularly if they had come from backgrounds in which they may have been the only person amongst their peer group and family to undertake university study. This proved a powerful motivator in the building of an aspirational identity:

When I first started to do this they (parents and friends), said oh this isn't you is it Mary? You aren't a university type are you? And I though well, I am doing this course aren't I? (student group D) (2, 4, 6, 8)

These enhanced feelings of self-salience and efficacy, of study having permeated the identity at a deep integrative level and transformed notions of previous identities, forming a type of escape into a new persona, feature prominently in the literature on working identities (McAdams, 2006; Singh, et al., 2006). As study becomes increasingly integrated into the individual's identity, it becomes less likely that a student will give this up, or risk losing a valuable part of themselves. The point at which the new identity is integrated with existing identities has been called 'the point of metanoia' (Alsup, 2006). Lave and Wenger et al. (1991a) see it as the point at which the individual is convinced that substantial investment in the new persona will be beneficial to the individual. In the literature on higher education this is reflected in the emphasis on effective induction programmes (Leadiwood, et al., 2003; Lowe et al., 2003) as well as a focus on the ways in which students may struggle as they move between levels: not purely from an academic point of view, but also as their identity as an autonomous learner develops and they leave behind the high levels of support that they encountered in year one.

For some, improved performance at work either through putting their knowledge into practice or capacity to take on greater responsibilities acted as a powerful motivator again due to the fact that the study permeated at a deep level in terms of their identities, enhancing their personal as well as professional confidence and enabling them to feel a greater degree of agency and control within their lives.

I thought it would be a good thing to do, then I realised that I could try it out at work and suddenly people were treating me differently. (student group D) (2, 4, 6)

The positive impact of continuing professional development on the professional identity of individuals has been widely recognised as being key to feelings of professional motivation, enhancing the sense of professional purpose and engendering greater levels of flexibility and creativity in the workplace, particularly in situations in which differing priorities in multiagency working may be eroding feelings of professionalism (Atkinson et al., 2005;

Baxter, 2011; Reynolds, 2007). The role of study has also been found to be important in increasing individuals' capacity to cope with organisational change (Anning, 2006; Daniels et al., 2007; Reeve, 1992), a constant feature of many organisations, particularly during times of austerity. This too was reflected by students:

I felt that some of the things I was learning helped me to see the bigger picture at work; I didn't get so bogged down. (student group D)(6)

This part of the discussion has highlighted the importance of student resilience in the formation of student identities. It has also drawn attention to the fragile nature of such resilience within the period during which the identities are being formed, as well as indicating the incremental nature of resilience within study. Although this phenomenon has appeared within several other studies into student retention (most commonly associated with student success), this study indicates a need for further research in this area in terms of a much wider scale study into the formation of student identity and the concomitant effect upon study resilience.

### What University Initiatives Have Had the Most Positive Influence on Student Motivation to Succeed?

Students outlined a number of university-led factors which had been important in making them continue. Feelings of value for money were highlighted in terms of both quality of materials provided and the levels of support provided by tutors. Some of the students, particularly those in the younger age groups, felt that it was very important to be receiving value for money. Tutors were considered to be axiomatic to the learning experience and perceptions of value for money at all points within the student journey, providing extrinsic motivation, support through difficult personal and academic periods, models and mentoring upon which to base their practices.

She always responded quickly and she knew how to point me in the right direction, she knew where to find everything (student group B) (1)

But solutions to practical and academic issues were paralleled by tutor ability to respond to more affective issues regarding confidence, personal problems, and learning difficulties:

There were problems, at home but the tutor was able to give me some good advice on how to still carry on studying (student group A) (1, 4, 5)

This affective intervention was seen as particularly important during the transition stage; although some of the students indicated that they had found central support staff very helpful, those that had experienced affective support from tutors appeared to have benefitted greatly when it came to moving from level one to level two.

It was difficult to see where to go next, even though there

were lots of options I didn't know would be best for me until I talked to my tutor. (student group F)(1,4)

Tutors that carried out this activity were able to confront student beliefs that were impeding progression and remind students of how far they had come, appealing to them from a meta-cognitive as well as an affective dimension. This duality of dimensional approach seemed to have a more integrating effect on students, making them feel a part of both the institution and perhaps more importantly a valued member of the academic community, albeit it at a relatively peripheral level. In terms of Lave and Wenger's community of practice theory, it would tend to suggest that the tutor is more instrumental than the institution at creating a sense of integration and strengthening salience and feelings of agency (Lave, et al., 1991)

In terms of social interaction students expressed varying expectations. Most of the respondents stated that their expectations of social interaction were fairly low.

Not something I've thought about because it's distance learning. You're not going to a place; you're doing it from home really. I don't have expectations of the social side. I got the concepts of it being distance learning, being on the internet ... (student group B) (5, 8)

For some people these expectations changed once they established themselves as students; this was particularly prevalent in group D, the group whose study goal had changed from doing a single module to aiming for a full qualification. In part, this seemed to be due to the glimpses of social life viewed through the lens of online forums, the feeling that others were interacting and having a good time.

I regret not making friends early on. Later on I did go to tutorials and made friends I am still in contact with. It was a big mistake not doing that in the first place. Once you made the connections with the people you did the tutorials with, you could monitor each other's progress and how you did. (student group D) (3, 5, 7)

Integration and contact with other students was perceived to be one of the key motivating factors in terms of student progression particularly in groups A, F, and B but concomitantly appeared as one of the factors that led to student attrition. This is discussed in the section which follows.

Although this section concentrates upon ways in which the institution effects a positive impact on student motivation to succeed, it also draws attention to a lack of knowledge around the distance learning experience, particularly in terms of the social realities of distance study. The distance learning student has access to many more social networking opportunities than in the past, and increasing familiarity with applications such as Facebook may concomitantly increase students confidence in online social engagement and the formation

of online student identities (see Baxter 2011a for further discussion). The section which follows discusses some of the issues arising from online student social and learning interactions and their impact upon student identities.

## Factors Impeding Progress

Online forums are key to university-led online interaction. In many modules they increasingly play a key part in online assessment strategies, requiring students to engage with one another in order to complete shared tasks. But forums emerged within this research as being one of the main reasons that students felt that their progress had been impeded. They also appeared to contribute to loss of confidence. Some respondents avoided them altogether or used them less than they could have, admitting to feeling intimidated and confused by postings and struggling with the practical issues of their use. Some were unprepared by removal of what moderators termed ‘inappropriate postings’.

There was a discussion on the forum but it was all taken away straightaway.’ (student group A) (1, 5, 8)

Students felt these issues of belonging, identity, and community were hard for the university to address but their suggestions focused on strengthening the physical bonds/contact of students through activities such as open days, visits to the regional offices or the campus at Milton Keynes. They were also keen to link up with fellow students although not necessarily by use of university social networking tools which were sometimes perceived to be problematic (discussed later in this paper). This seemed to be more of a focus for students in the younger groups:

I like to talk to other students but we’ve formed our own sort of group, chatting on MSN and even meeting up sometimes ...that works well (student group A) (3, 6)

As mentioned earlier, there are tensions between initial student expectations of social interaction and the ways that they feel about this once engaged in study. Although several students admit that one of the reasons for registering with a distance learning provider was due to the fact that no physical presence would be required during study, once they began their studies some students stated how much they had gained, both in terms of motivation and also feelings of developing a student identity (being a student), by meeting with others either online or face to face. However, online interactions did present some issues for students, issues that were, at times, overcome by the intervention of an efficient moderator:

The tutors have been very good. On the forums they see somebody is beginning to flag and come in with some gentle words or you can see they have and a private email with them to say don’t worry about this and they are very supportive. (student group D) (1,5)

Positive motivational factors were also described as impeding motivation at times when students had struggled. The view of the tutor varied quite substantially from being seen as purely a 'facilitator' of learning to being viewed as a mentor and role model as an active member of an occupational group which the student aspired to join. Where this was so, it seemed that the tutor had greater power in terms of their ability to override issues with curriculum, transition, and other extrinsic factors inhibiting progress. This supports evidence in the field which sees the role of the HE tutor as mentor, model, and teacher (Armitage, 1999; Clough, 2002; Cosh, 1998)

In terms of student identity, the quotes reveal that online interactions do have a substantial impact on student identities and that these are shaped by communications with both other students and tutors. The study indicates that there are some issues with the ways in which students articulate online identities that may impede motivation (or enhance it) depending upon the extent to which they are successful at this form of communication. Alternatively this may also depend upon the skill of the online moderator at developing and encouraging student contributions (see Baxter 2011 for further discussion).

## Conclusion

Although small scale, the study revealed that whilst salient student identities are formed from a complex mixture of personal, social, and academic factors, there were key points at which timely interventions, particularly by tutors, could make a substantial difference to student progression. This was particularly so at transition points between levels one and two and also during the induction period. Although many past studies of distance learning indicate that it attracts the type of student who is not particularly interested in socialising and interacting with others, this was certainly not the case in this study. A particularly interesting point that emerged during the research was the mismatch between initial expectations of social interaction and the ways in which these expectations changed and evolved during the study period. Again this was particularly marked in interviews with students from the younger age groups (under 25) but also appeared in all of the groups. This suggests that not only are student perceptions of distance learning changing, but that online interactions outside of the university may well be responsible for the feeling that social interaction plays a far greater part in fully online learning than it did in more blended modes. The study supported work done by HEFCE (2010) and the Higher Education Academy (2010, 2011), but also suggests that the expectations of students who study at a distance are changing partly due to the ability of some of their colleagues to initiate and sustain very successful online interactions and relationships with other students. For some students this is a motivating factor, particularly if interventions from both tutors and support staff are able to address lack of confidence in this area. If not addressed, this study suggests that the feelings of exclusion precipitated by lack of ability to successfully form online friendships may be equally, if not more, powerful reasons than academic issues in terms of why distance learning students fail to progress. It also suggests that this element is key to the formation and sustenance of the type of salient student identity which is robust and resilient enough to ensure that they progress from an initial module through to a full degree.

The study also indicated the ways in which student identity influences student resilience and capacity to progress from one level of study to another, confirming it to be a key factor to be addressed in future studies of retention and progression within the realm of distance learning in higher education.

## Acknowledgement

The author would like to acknowledge the help of J. Leach who assisted with the fieldwork for this study.

## References

- Allen, T. H. (2006). Is the rush to provide on-line instruction setting our students up for failure? *Communication Education*, 55(1), 122-126.
- Alsop, J. (2006). *Teacher identity discourses negotiating personal and professional spaces*. New Jersey: Lawrence Erlbaum Associates Ltd.
- Anning, A. (2006). *Developing multi-professional teamwork for integrated children's services: Research, policy and practice*. Open Univ Pr.
- Armitage, A., Briant, R., Hammersley, M., Hayes, D., & Lawes, S. (1999). *Teaching and training in post compulsory education*. Buckingham: Open University Press.
- Ashby, A. (2004). Monitoring student retention in the Open University: Definition, measurement, interpretation and action. *Open Learning*, 19(4), 65-77.
- Atkinson, M., Doherty, P., & Kinder, K. (2005). Multi-agency working. *Journal of Early Childhood Research*, 3(1), 7.
- Baldwin, L. (2008). *The discourse of professional identity in child and adolescent mental health services*. University of Nottingham, Nottingham.
- Baxter, J. (2011). *Public sector professional identities: Etiolation or evolution; a review of the literature*. Milton Keynes The Open University UK. Retrieved from <http://oro.open.ac.uk/29793/>
- Baxter, J. (2011a). *An investigation into the role of professional learning on the online teaching identities of higher education lecturers*. The Open University UK, Milton Keynes. Retrieved from <http://oro.open.ac.uk/33928/>
- Baxter, J., & Martyn, R. (2010). *Student progression: Effective interventions and areas for development*. The Open University UK.
- Baxter, J. (2010a). *Bien dans sa Peau : An investigation into the role of professional learning on the online teaching identities of HE lecturers*. Paper presented at the 21 Century Academic Identities Conference, The University of Strathclyde. Retrieved from <http://oro.open.ac.uk/26313/>
- Baxter, J. (2004). *Investigation into motivational factors behind using a second language as a means to gaining employment*. Retrieved from <http://www.cilt.org.uk/research/statistics/labourmarket/>
- Bhaskar, R. (1989). *Reclaiming reality*. London: Verso.

- Beijaard, D., Meijer, P.C., & Verloop, N. (2004). Reconsidering research on teachers' professional identity. *Teaching and Teacher Education*, 20, 107-128.
- Brabeck, M., & Brabeck, K. (2009). Feminist perspectives on research ethics. In *The handbook of social research ethics* (pp. 39-53).
- Buglear, J. (2009). Logging in and dropping out: Exploring student non-completion in higher education using electronic footprint analysis. *Journal of Further & Higher Education*, 33(4), 381-393.
- Burke, P. J., & Reitzes, D. C. (1991). An identity theory approach to commitment. *Social Psychology Quarterly*, 239-251.
- Burke, P. J., & Reitzes, D. C. (1981). The link between identity and role performance. *Social Psychology Quarterly*, 83-92.
- Clough, P. (2002). *Narratives and fictions in educational research*. Buckingham: Open University Press.
- Cosh, J. (1998). Peer observation in higher education - A reflective approach. *Innovations in Education and Training International*, 35, 171-176.
- Daniels, H., Leadbetter, J., Warmington, P., Edwards, A., Martin, D., Popova, A., et al. (2007). Learning in and for multi-agency working. *Oxford Review of Education*, 33(4), 521-538.
- Duemer, L., Fontenot, D., Gumfory, K., Kallus, M., Larsen, J. A., Schafer, S., et al. (2002). The use of online synchronous discussion groups to enhance community formation and professional identity development. *The Journal of Interactive Online Learning*, 1(2), 1-12.
- Edwards, R. (1996). Troubled times? Personal identity, distance education and open learning. *Open Learning*, 11(1), 3-11.
- Elliot, J. (2005). *Using narrative in social research*. London: Sage.
- Fitzgibbon, K. a. P., J (2006). Student's early experiences and university interventions - a timeline to aid undergraduate student retention. *Widening Participation and Lifelong Learning*, 8(3), 1, 7-46.
- Fozdar, B. I., & Kumar, L. (2007). Mobile learning and student retention. *International Review of Research in Open and Distance Learning*, 8(2), 18.
- Giddens, A. (1991). *Modernity and self-identity*. Cambridge MA: Polity Press.
- Glogowska, M., Young, P., & Lockyer, L. (2007). Should I go or should I stay?: A study of factors influencing students' decisions on early leaving. *Active Learning in Higher*

*Education*, 8(1), 63-77.

- Goodley, D., Lawthom, R., Clough, P., & Moore, M. (2004). *Life Stories, method theory and analyses in a biographical age*. London: Routledge.
- Gorelick, S. (1991). Contradictions of feminist methodology. *Gender and Society*, 5, 459-477.
- Harrell, I. L., & Bower, B. L. (2011). Student characteristics that predict persistence in community college online courses. *American Journal of Distance Education*, 25(3), 178-191.
- HEA. (2010). *Retention grants programme briefing 2*.
- HEA (2011). *Higher Education Academy what works? Student retention and success*. Retrieved from <http://www.heacademy.ac.uk/retention-and-success>
- Frydenberg, J. (2007). Persistence in university continuing education online classes. *The International Review of Research in Open and Distance Learning*, 8(3).
- Higher Education Funding Council for England (HEFCE) (2010). *Retention grants briefing programme number 3*. Bristol HEFCE - Paul Hamlyn Foundation. Retrieved from <http://www.hefce.ac.uk/>
- Herbert, M. (2006). Staying the course: A study in online student satisfaction and retention. *Online Journal of Distance Learning Administration*, 9(4). Retrieved from <http://fsweb.bainbridge.edu/qep/Files/TeachingRes/Staying%20the%20Course.pdf>
- Heron, J. (1999). *The complete facilitator's handbook*. London: Kogan Page
- Holstein, J. A., & Gubrium, J. F. (1995). *The active interview*. Thousand Oaks: Sage.
- Hotho, S. (2008). Professional identity—product of structure, product of choice: Linking changing professional identity and changing professions. *Journal of Organizational Change Management*, 21(6), 721-742.
- Janks, H. (1999). Critical language awareness journals and student identities. *Language Awareness*, 8(2), 111-122.
- Johnson, G. C., & Watson, G. (2004). 'Oh gawd, how am I going to fit into this?': Producing [mature] first-year student identity. *Language & Education: An International Journal*, 18(6), 474-487.
- Joseph, J. (2002). *Hegemony: A realist analysis*. London: Routledge.
- Jones, R. (2008). *Student retention and success: A synthesis of research*. York: The Higher Education Academy.

- Josselson, R. (1987). *Finding herself: Pathways to identity development in women*. San Francisco: Jossey- Bass.
- Josselson, R. (2007). *Playing Pygmalion: How people create one another*. New York: Jason Aronson.
- Kanter, R. M. (1968). Commitment and social organization: A study of commitment mechanisms in utopian communities. *American Sociological Review*, 499-517.
- Langridge, D. (2007). *Phenomenological psychology*. London: Prentice Hall.
- Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge: Cambridge University Press
- Leadiwood, C., & O'Connell, P. (2003). 'It's a struggle': The construction of the 'new student' in higher education. *Journal of Education Policy*, 18(6), 597-615.
- Lowe, H., & Cook, A. (2003). Mind the gap: Are students prepared for higher education? *Journal of Further and Higher Education*, 27(1), 53-76.
- Macfarlane, B. (2006). *Researching with integrity*. London: Routledge Farmer.
- Maclean, S.(2004). *Students turn to OU to avoid debt*. Retrieved from <http://www.guardian.co.uk/education/2004/jan/12/students.accesstouniversity>
- Maclure, M. (1993). Some thoughts on self-talk in research contexts. *British Journal of the Sociology of Education*, 14(4), 373-384.
- McAdams, D. P. (1997). *Stories we live by; personal myths and the making of the self*. Guildford: Guildford Press.
- McAdams, D. P., Josselson, R., & Lieblich, A. (2006). *Identity and story; create self in narrative*. Washington DC: American Psychological Association.
- Mishler, E. (2000). *Storylines: Craft narratives of identity*. Cambridge MA: Harvard University Press.
- Moore, K., Bartkovich, J., Fetzner, M., & Ison, S. (2003). Success in cyberspace: Student retention in online courses. *Journal of Applied Research in the Community College*, 10(2), 12.
- Motiwalla, L., & Tello, S. (2001). Distance learning on the Internet: An exploratory study. *The Internet and Higher Education*, 2(4), 253-264.
- Muilenburg, L., & Berge, Z. L. (2001). Barriers to distance education: A factor-analytic study. *American Journal of Distance Education*, 15(2), 7-22.

- Muir, R., & Wetherell, M. (2010). *Identity, politics and public policy*. Institute for Public Policy Research. Retrieved from <http://www.ippr.org/publications/55/1765/identity-politics-and-public-policy>
- O'Brien, B. S. (2002). Online student retention: Can it be done? In P. Barker & S. Rebelsky (Eds.), *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications* (pp. 1479-1483).
- Reeve, J. M. (1992). *Understanding motivation and emotion*. Fort Worth: Harcourt Brace Jovanovich College Publishers.
- Reynolds, J. (2007). Discourses of inter-professionalism. *British Journal of Social Work*, 37(3), 441.
- Scanlon, L., Rowling, L., & Weber, Z. (2007). 'You don't have like an identity...you are just lost in a crowd': Forming a student identity in the first-year transition to university. *Journal of Youth Studies*, 10(2), 223-241.
- Schofield, C., & Dismore, H. (2010). Predictors of retention and achievement of higher education students within a further education context. *Journal of Further & Higher Education*, 34(2), 207-221.
- Simpson, O. (2000). *Supporting students in open and distance learning*. Open and Distance Learning Series. London Kogan Page.
- Simpson, O. (2002). *Supporting students in online, open and distance learning*. Routledge Falmer.
- Singh, V., Vinnicombe, S., & James, K. (2006). Constructing a professional identity: How young female managers use role models. *Women in Management Review*, 21(1), 67-81.
- Stryker, S., & Serpe, R. T. (1994). Identity salience and psychological centrality: Equivalent, overlapping, or complementary concepts? *Social Psychology Quarterly*, 16-35.
- Tinto, V. (2009). How to help students stay and succeed. *Chronicle of Higher Education*, 55(22), A33-A33, 31-34.
- Tinto, V. (2007). Research and practice of student retention: What next? *College Student Retention*, 8(1), 1-19.
- Tinto, V. (2000). What have we learned about the impact of learning communities on students? *Assessment Update*, 12(2), 1.
- Trowler, V. (2010). *Student engagement literature review*. Lancaster University. Retrieved from <http://www.heacademy.ac.uk/assets/documents/studentengagement/StudentEngagementLiteratureReview.pdf>

- Wenger, E. (1998). *Communities of practice: Learning meaning and identity*. New York: Cambridge University Press.
- White, C. (2007). Innovation and identity in distance language learning and teaching. *International Journal of Innovation in Language Learning and Teaching*, 1(1), 97-110.
- Yin, R. K. (1993). *Applications of case study research*. London: Sage.
- Yorke, M., & Longden, B. (2008). *The first year experience of higher education in the UK*. York: The Higher Education Academy
- Yorke, M. (2004). Retention, persistence and success in on- campus higher education, and their enhancement in open and distance learning. *Open Learning*, 1(9), 19-33.
- Yorke, M. (1999). *Leaving early: Undergraduate non-completion in higher education*. London: Falmer.

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# Organizational Factors' Effects on the Success of E-Learning Systems and Organizational Benefits: An Empirical Study in Taiwan



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## Abstract

E-learning development for enterprises is still in its infancy in that scholars are still working on identifying the critical success factors for e-learning in organizational contexts. This study presents a framework considering how organizational factors affect the quality and service of e-learning systems and how these factors influence organizational benefits in the view of IS success model and resource-based theory. A questionnaire survey of 120 Taiwanese companies was performed to validate the framework. The results show that top management support, information security policy, and institutional policy are positively related to system quality, while top management support, organizational learning culture, and institutional policy are positively related to system service. Additionally, system service is significantly related to organizational benefits. Our model provides two novel aspects of e-learning study. Firstly, we extend IS success model by incorporating four organizational factors as antecedents influencing system quality and system service. Secondly, the model is framed and examined on an organizational level, which provides a top-down view for managers when designing and implementing e-learning systems in the organizational context.

**Keywords:** E-learning system; top management support; organizational learning culture; information security policy; institutional policy; organizational benefits

## Introduction

The e-learning system (ELS), which is an information system (IS), is often associated with human resources and can be seen as a strategic tool for organizations. The benefits to introduce ELS include (a) higher employee satisfaction, (b) better opportunities for career growth and flexible learning for employees, (c) increased innovation, (d) better operation-

al efficiency, and (e) cost savings (Cukusic, Alfirevic, Granic, & Garaca, 2010; Lai & Liou, 2010). These benefits help organizations obtain outstanding employees, more efficient business procedures, and lower costs. However, e-learning development for enterprises is still in its infancy and two research streams have been studied. One stream focused on case studies which presented the processes and implications of introducing various ELS to enterprises, such as Telenor (Netteland, 2009), Virgin Atlantic Airways (Carruth, 2007), BT Dials (Overton, 2007), Lucent (Gold, 2003), and Kodak (Gold, 2003). These studies demonstrated the difficulties enterprises encountered and how these difficulties were tackled. Another stream focused on identifying the CSFs for enterprises. For example, McPherson and Nunes (2006) conducted a focus group and revealed 66 CSFs divided into four clusters: leadership, structure and culture, design, technology and delivery. Sela and Sivan (2009) conducted twelve semistructured interviews and categorized CSFs into “must-have” and “nice-to-have.” The former included useful and easy to use tools, marketing, management support, right organizational culture, and a real need for organizations. The latter included time to learn, support, mandatory learning, and incentives. These studies highlighted the key issues as a guideline when designing and implementing ELS.

However, these up-to-date studies only proposed scattered factors instead of an intact framework to depict how organizational factors affect ELS success and organizational benefits. Altarawneh (2011) reported that organizational issues account for 70% of ELS implementation problems. These organizational issues are insufficient funds to develop ELS (83%), a lack of ELS strategies and politics (67%), a lack of clear, accessible communication channels (51%), a lack of interest regarding e-learning education (49%) and a human resource strategy (43%). Additionally, studies exploring the critical success factors of implementing ELS in organizations reported that organizational factors are important for ELS success, such as business process redesign, learning culture (Chen & Hsiang, 2007; Sela & Sivan, 2009), manager support (Sela & Sivan, 2009; Elliott & Clayton, 2009), and policy set up and enforcement (Admiraal & Lockhorst, 2009). It can be concluded that ELS success depends on the support of other participants in organizations, such as the human resources, finance, and technology divisions. Thus, organizational factors cannot be ignored when considering the sustainability of ELS (Netteland, 2009). Additionally, scholars (e.g., Lai & Liou, 2010) have reported that ELS improves an organization's profitability and productivity, which implies that ELS success has positive effects on organizational benefits. Therefore, we assume that organizational factors affect ELS success, and ELS influences organizational benefits.

By revealing the relationships among organizational factors, ELS, and organizational benefits, the results of such empirical study are capable of supporting educationalists and practitioners to evaluate and construct ELS at both organizational and strategic levels. Therefore, the aims of this study are

1. to identify the factors affecting organizational benefits in the context of enterprises, and
2. to develop and empirically examine the proposed framework and provide support for managers to improve ELS and organizational benefits.

The rest of this paper is organized as follows: We begin by identifying the factors affecting organizational benefits based on the information system success model and resource-based theory. Then we present the proposed model and hypotheses. The research methodology section describes the methods of collecting questionnaires. Results of the data analysis by partial-least-squares (PLS) are presented next along with a discussion of our findings. We conclude by considering the implications for managers and future researchers.

## Theoretical Background

### Information System Success Model (ISSM)

The IS success model (ISSM) by DeLone and McLean (1992) is one of the most widely cited. Scholars have applied this model to examining various IS contexts, such as knowledge management (Kulkarni, Ravindran, & Freeze, 2006, 2007) and e-commerce (Garrity, Glassberg, Kim, Sanders, & Shin, 2005). Their model provides a scheme for classifying the numerous IS success factors and suggests causal relationships between the categories. The updated ISSM (DeLone & McLean, 2003) claimed that information quality, system quality, and service quality are the antecedents influencing organizational benefits. Information quality captures IS content issues, such as personalization, completeness, relevance, ease of understanding, and security. System quality measures IS performance: usability, availability, reliability, adaptability, and response time. Service quality evaluates the overall support for users by the department. These three quality measures affect users' satisfaction and in turn influence organizational benefits.

Traditional IS is product-oriented and its evaluation focuses on system performance, which directly influences users' satisfaction with the system. For example, data inaccuracy and slow response time may quickly dissatisfy users. However, IS also plays a service role (Pitt, Watson, & Kavan, 1995). In an ELS context, ELS service provides services like staff training (Carruth, 2007), new information updating (Overton, 2007), flexible queries (Morch, Engen, & Asand, 2004), and skill and career updating (O'Brien & Hall, 2004). As to information quality, the information produced by ELS can be course materials, personal learning schedules, and outcomes, which can be seen as a segment of ELS service. Thus, the idea of information quality overlaps service quality, that is, the concept of information quality can be covered by service quality. This leads to our conclusion that both system quality and service quality should be incorporated in our model.

The three issues should be noticed for applying ISSM to our study. Firstly, the assumption of ISSM is that the users volunteer to use the system (Freeze, Alshare, Lane, & Wen, 2010). Nevertheless employees in enterprises are required to use ELS. That is, whether employees are pleased or not, they must study through ELS. From an organizational viewpoint, users' satisfaction could be noticeable but whether employees possess the indispensable skills and apply these skills to create benefits is more important. Another issue is that ISSM mainly focuses on an individual level instead of an organizational level. When designing ELS, managers' lenses must focus on organizational and strategic levels (Chen & Hsiang, 2007), such

as how to reduce costs and create competitive advantage. Therefore, the organization would benefit from managers' decision-making if ISSM is interpreted on an organizational level. The third issue is that ISSM emphasizes the importance of information quality, system quality, and service quality but shows no clues about what antecedents affect them. These antecedents could be critical when designing and implementing ELS. Revealing these factors would contribute significantly to managers' decision-making. Based on the discussion above, we apply ISSM on an organizational level and investigate organizational antecedents which affect system quality and service quality based on resource-based theory.

## Resource-Based Theory

Resource-based theory (Barney, 1991) is used to provide a theoretical foundation to explore the antecedents which affect system quality and service. This theory suggests that organizational resources which are costly or hard to imitate help organizations retrieve competitive advantage. One resource-based research stream has considered the functional capabilities of IS as the source of competitive advantage (e.g., Bharadwaj, 2000). Another perspective has focused on how resources are channelled and utilized to bring competitive advantage (e.g., Ravichandran & Lertwongsatien, 2005). However, both streams agree that resource availability determines IS capabilities and further affects organizational performance (Ray, Muhanna, & Barney, 2005).

Powell and Dent-Micallef (1997) categorized organizational resources as human, business, and technology. Human resource relates to people and ambiance of organizations, including culture, communication, consensus, CEO commitment, and strategy integration. Business resource relates to process and policy, including supplier relationship, training, process, and performance benchmarks. Technology resource includes computer hardware and software. For our study, technology resource can be incorporated by system quality, thus we applied the two dimensions to our model: human and business resources.

In order to explore the organizational factors to form the framework, we analyzed past studies that conducted interviews, case studies, and focus groups to explore a variety of CSFs for ELS. Four factors were summarized to fit the two dimensions. Organizational learning culture (McPherson & Nunes, 2006; Chen & Hsiang, 2007; Admiraal & Lockhorst, 2009; Sela & Sivan, 2009) and senior management support (McPherson & Nunes, 2006; Sela & Sivan, 2009; Elliott & Clayton, 2009) were classified as human dimension while institutional policy (Chen & Hsiang, 2007; Admiraal & Lockhorst, 2009) and information security policy (McPherson & Nunes, 2006; Elliott & Clayton, 2009) were classified as business dimension. The four factors provide a lens explaining the critical resources possessed by organizations and how they could impact ELS capabilities.

## Research Framework and Hypotheses

Figure 1 shows the proposed framework which presents linkages among the four organizational factors, system quality and service, and organizational benefits. System quality and system service intermediate the impacts from organizational factors to organizational ben-

efits. Organizational benefits evaluate the advantages brought by ELS. The following sections discuss each construct and build the hypotheses.

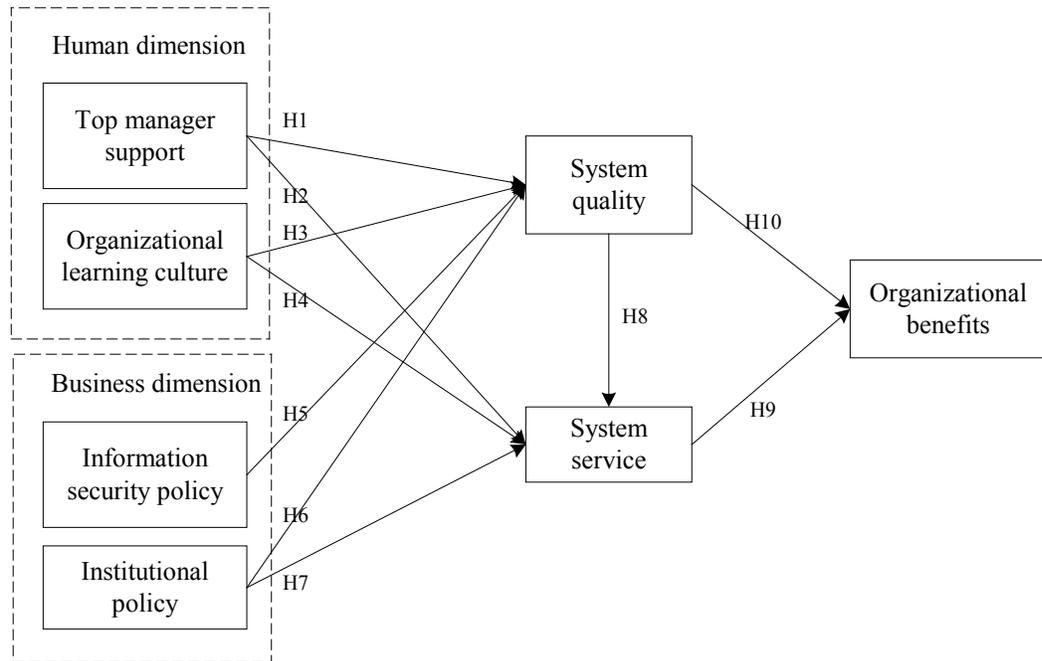


Figure 1. The framework of this study.

## Top Management Support (TMS)

TMS is defined as the involvement and participation of top-level leaders. Mintzberg (1971) stated that managers are specialists who perform a particular set of specialized managerial roles that consist of three dimensions: interpersonal roles (figurehead, leader, and liaison), informational roles (monitor, disseminator, and spokesman), and decisional roles (entrepreneur, disturbance handler, resource allocator, and negotiator). Among them, decisional roles are critical for identifying business needs, allocating resources and negotiating conflicts between divisions, and ensuring that ELS is exploited in a planned and strategic manner. The full support of top managers ensures richer resources, better communication between different departments, and superior decision-making (Sela & Sivan, 2009; Elliott & Clayton, 2009).

We hypothesize that TMS is positively related to system quality and system service. TMS is one of the important factors to IT success (Sohal, Moss, & Ng, 2001) and positively influences the performance of IS development projects (Lu, Zhao, & Han, 2008). With TMS, the commitment of financial and technological resources improves system function and reliability, which promotes better system quality (Wang & Chen, 2006). Additionally, these resources also guarantee better services. For example, an excellent help desk service can reduce users' anxiety and a well-designed ELS can provide better information quality, definite learning direction, and career advice. TMS can also lower users' resistance and ensure the proper implementation of ELS (Thong, Chee-Sing, & Raman, 2001; Lu et al., 2008).

Therefore, the following hypotheses are proposed.

Hypothesis 1: Top management support is positively related to system quality.

Hypothesis 2: Top management support is positively related to system service.

### Organizational Learning Culture (OLC)

OLC is a set of norms and values concerning the functioning of an organization that support systematic and in-depth methods of generating knowledge or achieving higher level strategy through phases of information acquisition, information interpretation, and changes to employees' behavior and cognition (Škerlavaj, Štemberger, Škrinjar, & Dimovski, 2007). In the e-learning context, OLC focuses on the value of an atmosphere of knowledge creation and sharing, mutual help, and the achievement of organizational goals.

When designing and implementing ELS solutions, adapting OLC to the solutions is crucial to avoid potential conflict (McPherson & Nunes, 2006). OLC joins content, technologists, experts, and employees to construct an e-learning environment. Škerlavaj et al. (2007) reported that OLC has a positive direct impact on nonfinancial performance (performance from the employees, customers, and suppliers) and a positive indirect impact on financial performance through employee performance. They concluded that cultivating an environment where employees can and should continually learn and share their knowledge is crucial to the competitive advantage of organizations. Chou (2003) explained that OLC moderates the influence of ELS on organizational learning, which implies that OLC acts with ELS to accumulate organizational knowledge.

Strong OLC ensures employees overcome their differences and head toward organizational goals (Martins & Treblanche, 2003), so user resistance can be reduced and better communication can be achieved (Khan, 2005). Therefore, the planning and implementation of ELS can be controlled, allowing better system quality (Cukusic, et al., 2010). Thus, Hypothesis 3 is proposed.

Hypothesis 3: Organizational learning culture is positively related to system quality.

OLC is a powerful aid to knowledge management and organizational change, owing to its potential for affecting individual behaviors and organizational outcomes. The former includes employees' information-sharing behaviors and the ability to exploit technology and knowledge, while the latter includes innovativeness and competitive advantage (Lai, Lin, Lin, Wang, & Huang, 2009; Škerlavaj, Song, & Lee, 2010; Liao & Wu, 2010). To make e-learning effective, continuously adjusting the functions and strategies in line with the business environment is important for the sustainability of ELS. OLC improves an organization's ability to apply and adapt e-learning to cope with its predicaments. For example, Lucent Technologies (Gold, 2003), a communications network provider, needed to integrate over 12 systems across different countries to consolidate them into a single and standardized ELS. The adaptation of different cultures, different languages, and business procedures was the key to the integration task. The organizational culture of Lucent, which

promoted sharing, respect, and synergy, helped individuals give up a certain amount of freedom and individuality. In turn Lucent's ELS provided satisfactory service for customers and staff. In sum, OLC promotes information integrity, information-sharing behavior, and the allocation of more labor and budget to ELS projects. More resources also create better help service by reducing the obstacles to promoting ELS. Therefore, Hypothesis 4 is proposed.

Hypothesis 4: Organizational learning culture is positively related to system service.

### Information Security Policy (ISP)

Information security is an interdisciplinary field encompassing aspects of organization, management, and technology (Werlinger, Hawkey, & Beznosov, 2009). Most efforts in this field have been traditionally dedicated to technical or managerial issues. As the role of information security shifts from a supporter to a value creator, it faces more challenges due to the increasingly sophisticated threats to information safety. McPherson and Nunes (2006) conducted research using a focus group and reported that interviewees identified ISP as one of the CSFs of ELS. ELS may contain confidential information that is important for business operations, such as patent documents and customers' information. Organizations obtain benefits from protecting them. These benefits include enhancing organizations' reputation, increasing customer trust, and sustaining business resiliency (Opstal, 2007; Nyanchama, 2005). Conversely, failure to establish ISP can disrupt business operations and deteriorate organizational reputation and competitiveness as well as that of its customers (Fratto, 2009).

Information security measures include access control and information privacy (Khan, 2005), and they should be enacted as policy. For example, Kodak's (Gold, 2003) enterprise-wide ELS delivered digital learning to 50,000 employees in 57 countries. Some courses contained classified information that might damage the company's competitive advantage, reputation, and customers' trust if leaked. Therefore, to protect the system from outside hackers and internal employees who might unwittingly download and install malicious software, only authorized people were allowed to access the Internet by inputting codes. Even those with Internet access authorization were restricted by firewalls from downloading files, programs, email attachments, and plug-ins.

In sum, ISP ensures the confidentiality, integrity, availability, and better control of information assets. It also responds promptly to and recovers quickly from information security attacks (Hagen, Albrechtsen, & Johnsen 2011), allowing for a more stable ELS with better system quality. Thus, Hypothesis 5 is proposed as below.

Hypothesis 5: Information security policy is positively related to system quality.

### Institutional Policy (ITP)

ITP refers to the organization's commitments, goals, and values and how these can be transmitted and achieved. It facilitates the rapid diffusion of e-learning within organizations (Nichols, 2008) and is a driving force in the ground-level activities that move orga-

nizations forward (Rossiter, 2007). ITP can be categorised into three levels: senior-level formal support, e-learning structures, and institution-wide systems (Czerniewicz & Brown, 2009). The first relates to senior managers' commitments in terms of support and resource allocation. The latter two relate to e-learning course content, delivery, evaluation method, and computer systems. ITP which should be publicized in written format creates a legal norm for everyone to follow and establishes a predictive environment in which to work. Those supportive, flexible, non-restrictive policies benefit effective e-learning and foster organizational innovation.

From a resource-based view, ITP is enacted through the resources of organizations. Adequate resources ensure that organizations can construct e-learning structures and systems (Marshall & Mitchell, 2005). Without sufficient monetary and expert support, satisfactory system quality is rarely achieved. Thus, Hypothesis 6 is proposed.

Hypothesis 6: Institutional policy is positively related to system quality.

ITP affects both the professional development of employees and the strategic adjustment of organizations (Admiraal & Lockhorst, 2009). In the initial stage of implementing ELS, organizations need to provide incentives that motivate employees to use ELS (Schreurs, Gelan, & Sammour, 2011), such as rewards, promotion, or personal growth. In the latter stage, competency assessment helps employees improve their learning skills and direct organizations to renovate functions, courses, and strategies. Thus, with the guidance of an appropriate ITP, a climate of consensus of learning and sharing can be formed, and the functions of ELS can be enhanced to meet employees' needs. And in turn system service can be improved. Hypothesis 7 is proposed.

Hypothesis 7: Institutional policy is positively related to system service.

### System Quality, System Service, and Organizational Benefits

Usefulness and ease of use are compulsory for ELS (Sela & Sivan, 2009) and system quality is positively related to service quality (Kettinger, Park, & Smith, 2008). According to the TAM (technology acceptance model), an easy-to-use system gives users a greater perception of usefulness and promotes a positive attitude toward the system, which implies that a system with better quality (such as better response time, reliability, and accuracy) can deliver better services. Additionally, according to ISSM, system quality may affect organizational benefits. Thus, Hypothesis 8 and 9 are proposed.

Hypothesis 8: System quality is positively related to system service.

Hypothesis 9: System quality is positively related to organizational benefits.

ELS service is positively related to service value and users' satisfaction (Kettinger et al., 2008; Cenfetelli & Bassellier, 2009). Users' satisfaction is positively related to the intention to use the system (Garrity et al., 2005) and in turn affects individual performance and organizational performance (Garrity & Sanders, 1998). Sustaining users' intentions to use

ELS is a key to achieve organizational goals. Therefore, we assume that providing better services can improve users' satisfaction and prolong the intention to use ELS, which increases organizational benefits. Therefore, Hypothesis 10 is proposed.

Hypothesis 10: System service is positively related to organizational benefits.

## Research Methodology

### Measurement Development

Seven constructs were evaluated: information security policy, top management support, organizational learning culture, institutional policy, system quality, service quality, and organizational benefits. Measurement items derived from past studies were reworded to relate specifically to ELS in the organizational context. The review and refinement of the items by two MIS professors secured content validity. A pilot test was conducted; questionnaires were sent to 30 companies that had introduced ELS and 20 companies responded. Measurement items were then revised according to their responses and are shown in the Appendix.

### Subjects

Our analytic unit was organization instead of individual; thus, we collected only one questionnaire for each organization to represent the idea of that organization. These questionnaires were analyzed to validate our model to present a generalized result. We obtained the initial target companies which currently were using ELS to support their business from e-learning conferences and friends. Then we contacted the senior managers individually, like CEOs or ELS managers who were estimated as having adequate knowledge of the organizational learning culture, policy setting, ELS performance, and organizational benefits. Only one questionnaire was sent to the person we contacted and he/she was asked to fill in the questionnaire or forward it to someone who was eligible and willing to participate. To increase the sample size, we adopted a snowball sampling method which requested the participants' favor of providing both other companies they knew that were using ELS and possible participants. As a result, we distributed the questionnaires to 136 Taiwanese companies and a total of 120 companies/participants responded, giving a final response rate of 88.2%. These 120 questionnaires represented the ideas from 120 companies. We used the data to validate the model and the result was able to present a general schema of how these factors affect organizational benefit in an organizational view.

## Data Analysis and Results

### Measurement Validity

Partial-least-squares (PLS) was used to construct the path coefficients for the model. Compared to structural equation modeling, PLS is more suited to the early stages of theory

development and smaller sample sizes (Henseler, Ringle, & Sinkovics, 2009). Thus, Smart-PLS 2.0 was used to perform measurement validity and structural modeling.

Construct validity was evaluated by convergent validity and discriminant validity. According to Henseler et al. (2009) both validities can be confirmed if the indicators fit these conditions: (a) a factor loading has a higher correlation with another latent variable than with its respective latent variable; (b) the average variance extracted (AVE) is higher than 0.5; (c) the composite reliability (CR) must be greater than 0.6; and (d) the square root of each construct's AVE is larger than its correlations with other constructs. All indicator factor loadings were well loaded on their constructs; their own loadings were much higher than the cross-loadings with other constructs (see Table 1). The reliability was evaluated using Cronbach's alpha and the values were all above 0.70 (see Table 2), which indicates a reliable measurement instrument. The AVE values were all above 0.50 and CR values were all above 0.83 (see Table 2). The square roots of AVE values were greater than the correlations between any pairs of constructs located in their horizontal lines and vertical columns, proving that the AVE values for the seven constructs were higher than the variance due to measurement error. Thus, each construct was verified as distinct and the test of discriminant validity was successful.

Table 1

*Results of Validity – Cross Loadings*

Items	TMS <sup>d</sup>	OLC <sup>a</sup>	ISP <sup>b</sup>	ITP <sup>c</sup>	SQL <sup>e</sup>	SSV <sup>f</sup>	OGB <sup>g</sup>
TMS1	0.66	0.30	0.32	0.11	0.09	0.16	0.32
TMS2	0.69	0.20	0.36	0.16	0.05	0.08	0.22
TMS3	0.89	0.31	0.43	0.25	0.17	0.35	0.36
TMS4	0.84	0.35	0.24	0.32	0.24	0.25	0.41
TMS5	0.92	0.42	0.41	0.31	0.24	0.32	0.34
OLC1	0.51	0.84	0.40	0.28	0.58	0.60	0.46
OLC2	0.40	0.93	0.37	0.42	0.65	0.71	0.53
OLC3	0.36	0.89	0.43	0.34	0.60	0.67	0.51
OLC4	0.41	0.88	0.47	0.51	0.64	0.53	0.50
OLC5	0.05	0.84	0.29	0.56	0.84	0.68	0.62
OLC6	0.31	0.82	0.18	0.61	0.78	0.59	0.73
ISP1	0.27	0.10	0.61	0.28	0.22	0.21	0.47
ISP2	0.27	0.36	0.75	0.17	0.32	0.41	0.10
ISP3	0.32	0.23	0.85	0.02	0.20	0.36	0.14
ISP4	0.42	0.44	0.64	0.18	0.39	0.50	0.28
ISP5	0.15	0.23	0.63	0.23	0.23	0.20	0.32
ISP6	0.03	0.12	0.43	0.30	0.15	0.04	0.04
ITP1	0.30	0.04	0.21	0.54	0.18	0.21	0.49
ITP2	0.17	0.36	0.35	0.89	0.67	0.60	0.60
ITP3	0.05	0.23	0.11	0.75	0.42	0.20	0.32
ITP4	0.39	0.69	0.17	0.87	0.69	0.62	0.61
SQL1	0.18	0.85	0.32	0.51	0.86	0.79	0.61
SQL2	0.13	0.78	0.33	0.52	0.87	0.73	0.65
SQL3	0.10	0.55	0.23	0.58	0.84	0.67	0.55
SQL4	0.33	0.67	0.43	0.66	0.86	0.67	0.73
SQL5	0.02	0.49	0.36	0.63	0.83	0.73	0.66
SSV1	0.23	0.57	0.37	0.50	0.77	0.87	0.66
SSV2	0.34	0.67	0.50	0.47	0.65	0.83	0.57
SSV3	0.27	0.54	0.35	0.62	0.70	0.88	0.60
SSV4	0.19	0.59	0.32	0.52	0.75	0.92	0.73
OGP1	0.19	0.53	0.32	0.44	0.59	0.71	0.82
OGP2	0.03	0.34	0.02	0.53	0.58	0.58	0.71
OGP3	0.39	0.44	0.21	0.46	0.49	0.29	0.66
OGP4	0.49	0.47	0.44	0.57	0.58	0.51	0.76
OGP5	0.17	0.49	0.10	0.52	0.73	0.72	0.82

<sup>a</sup>Organizational Learning Culture, <sup>b</sup>Information Security Policy, <sup>c</sup>Institutional Policy, <sup>d</sup>Top Management Support, <sup>e</sup>System Quality, <sup>f</sup>System Service, <sup>g</sup>Organizational Benefits

Table 2

*AVE, Square Root of AVE, Alpha, CR, and Correlations*

	TMS	OLC	ISP	ITP	SQL	SSV	OGB	Al- pha	CR	AVE
TMS	0.71 <sup>a</sup>							0.85	0.83	0.50
OLC	0.41	0.71 <sup>a</sup>						0.85	0.85	0.51
ISP	0.41	0.42	0.74 <sup>a</sup>					0.86	0.87	0.55
ITP	0.31	0.53	0.29	0.75 <sup>a</sup>				0.85	0.84	0.57
SQL	0.23	0.64	0.42	0.71	0.76 <sup>a</sup>			0.81	0.83	0.57
SSV	0.32	0.70	0.50	0.62	0.79	0.80 <sup>a</sup>		0.90	0.88	0.64
OGB	0.42	0.65	0.35	0.68	0.70	0.72	0.76 <sup>a</sup>	0.88	0.87	0.57

<sup>a</sup>Square root of AVE

### PLS Path Modeling and Hypotheses Testing

The hypotheses were then examined by the path coefficients of the model shown in Figure 2. As expected, Hypothesis 1 and 2 were supported, which implies that TMS was associated with system quality and system service. OLC was positively related to system service but not system quality, showing that Hypothesis 3 was supported but Hypothesis 4 was not. Hypothesis 5, 6, and 7 were supported, proving that ISP and ITP were positively related to system quality, and ITP was positively related to system service. System quality was proved to be positively related to system service but not to organizational benefits, and system service was positively related to organizational benefits. These results confirmed Hypothesis 8 and 9 were supported but Hypothesis 10 was not. Table 3 summarizes the significant direct/indirect/total effects of variables on organizational benefits. Analysis of Table 3 indicated that ITP and OLC had stronger impacts, TMS had a moderate impact, and ISP had a weak impact on organizational benefits individually. Also, system service served as an important mediator for the indirect relationships between other variables and organizational benefits.

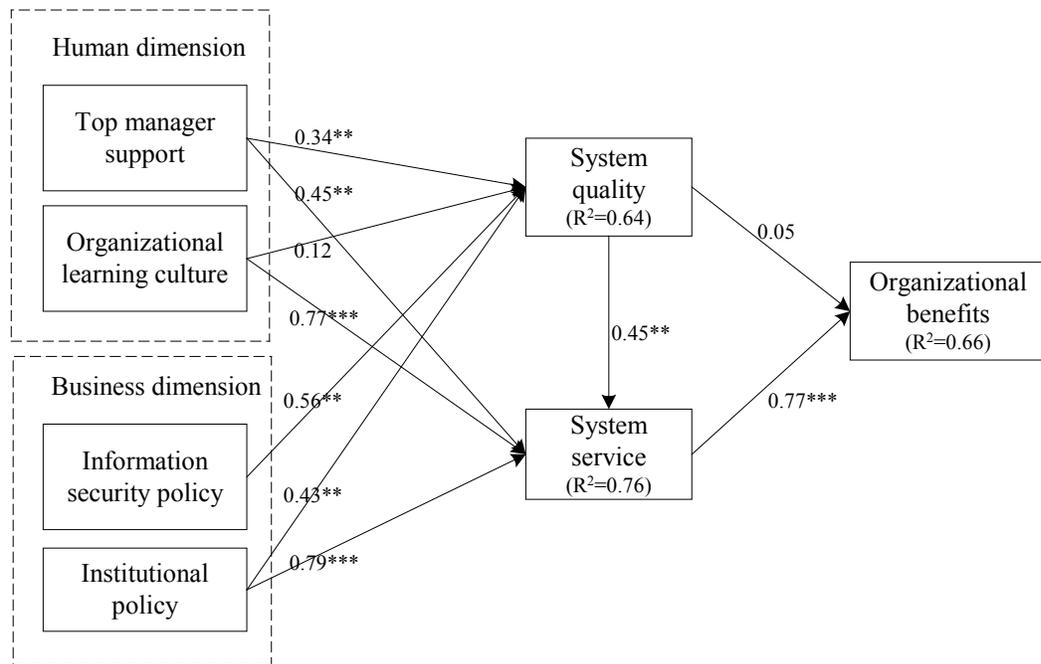


Figure 2. PLS path model (\*\*p < 0.05, \*\*\*p < 0.01)

Table 3

*Direct/Indirect/Total Effects of Variables on Organizational Benefits*

Factors	Direct effect	Indirect effect	Total effect
Top management support		0.47	0.47
Organizational learning culture		0.59	0.59
Information security policy		0.19	0.19
Institutional policy		0.75	0.75
System quality		0.35	0.35
System service	0.77		0.77

## Discussion and Implication

The empirical results indicated the relationships between the four organizational factors, system quality, system service, and organizational benefits. TMS, ISP, and ITP were positively related to system quality and accounted for 64% of the variance of system quality. These findings were consistent with past studies (e.g., Wang & Chen, 2006; Czerniewicz & Brown, 2009). From the observation of path coefficients, business dimension factors (ISP and ITP) contributed more than a human dimension factor (TMS), which implies that the establishment of process and policy is slightly more important than the ambiance of an organization in terms of upholding a high-quality ELS. The results also suggested that system quality depends not only on high-performance computer hardware and software but also the supports of managers, appropriate security policy, and the performance evaluation of

employees and ELS. TMS guarantees that adequate resources, such as budget and labor, are allocated to support ELS. ISP ensures the confidentiality, integrity, availability, and better control of information assets, which allows for a better system quality. ITP creates a legal norm to which employees must adhere. Its competency assessments not only help employees realize their learning performance but also help managers modify ELS structures and functions.

TMS, OLC, and ITP were positively related to system service. These findings were consistent with past studies (e.g., Škerlavaj et al., 2007; Lu et al., 2008; Škerlavaj et al., 2010). From the observation of path coefficients, business dimension factors (TMS and OLC) and a human dimension factor (ITP) contributed equally to system service, which implies that both the establishment of policy and the ambiance of organizations are important for improving service of ELS. ELS service quality is nurtured by the supports of managers, organizational learning culture, and the performance evaluation of employees and ELS. The support of managers is capable of reducing employees' resistance and improving help desk service to increase the users' satisfaction. OLC creates an atmosphere of sharing, respect, and synergy for both users and IT staff. The evaluation of ELS provides the chance to adjust system service in line with the change of working environment and processes.

System quality was proved to be significantly related to system service but insignificantly related to organizational benefits. System service was proved to be significantly related to organizational benefits. The results induced an implication: system service is a key index to organizational benefits. System quality for ELS is compulsory and fundamental. It could be critical at the initial stage of implementing ELS but diminish over time (Wu & Wang, 2006). System service provides a baseline judgment about whether system quality satisfies users and other organizational factors are available and successfully implemented. Thus, system service can be seen as a threshold to evaluate whether ELS creates benefits for organizations. Most IS development projects focus on building secure, fast, multifunctional, and stable systems but guarantee no organizational benefits. Therefore, ELS managers need to focus on designing service by carefully analyzing organizational needs and providing satisfactory service.

TMS had a moderate effect on organizational benefits. It is a prerequisite for ELS projects and is essential to sustain a steady development of ELS (Sela & Sivan, 2009; Elliott & Clayton, 2009). Senior managers should display their full support by attending every important meeting, contributing their opinions to the decision-making process, and arbitrating the conflicts between divisions. They also need to assure the availability of budgets for updating hardware and software and for faster Internet connectivity.

The two factors (ISP and ITP) related to policy were proved to significantly impact organizational benefits intermediated by system quality and system service. This result indicated the importance of policy establishment toward the success of ELS. ITP refers to the policy which realizes organizations' commitments, goals, and values while ISP refers to employees' behaviors to secure ELS stability and information assets. Both factors create a legal norm for employees to obey. The legal norm guides employees to make a concerted effort

to accomplish the organizational goals. However, ISP was found to have a weak impact on organizational benefits (see Table 3). Although organizations may suffer from the negative impact of information security accidents caused by loose control, rigid control may hinder information flow and knowledge sharing. Most ELS in participant companies may only provide online courses which cultivate skills for routines and fundamental jobs and may not contain much critical and confidential information. Thus the result was understandable. However, when ELS plays a vital role in training employees and supporting business, ISP may display its gravity.

## Conclusion

The empirical results of this study provided considerable support for the proposed model. Eight of the 10 hypotheses were found to be significant, providing valuable insight into how organizational factors affect system quality, system service, and organizational benefits. The four organizational factors should be considered in aggregate when designing and implementing ELS. Organizations must establish goals and strategize in line with OLC. These strategies must be publicized in written documents such as ISP and ITP. Also, TMS ensures that enough resources are allocated and guarantees policy enforcement. Furthermore the four factors may have different weights at different stages. OLC should be considered comprehensively in the design phase and top managers should provide their full support in the implementation phase. ISP assures ELS security and ITP guides staff toward better learning outcomes and career paths while ELS is functioning.

Our framework created two new aspects for e-learning researchers and practitioners. Firstly, ISSM emphasized how IS affects users' satisfaction but the antecedences influencing system quality and system service were missing. Our model filled in this gap by incorporating four antecedences and empirically examined their relationships. For practitioners, these key factors helped managers focus on critical jobs to improve ELS performance and bring the maximum benefits for organizations. For researchers, we recommend extending our model by investigating more exogenous variables, such as leadership, strategy, and trust, and the interactions between these variables. Secondly, most studies which applied ISSM focused on an individual level (see Petter & McLean, 2009). Although users' satisfaction could be important, the support from the organization is the foundation to nurture ELS. Our model which was framed and examined at an organizational level provided managers a practical view to evaluate ELS. For example, conditions such as whether the board provides full support to implement ELS or whether ELS fits into the organizational culture need to be considered seriously before an ELS project commences. For scholars, our model illuminated a new research aspect of ISSM. Applying ISSM in an organizational context can provide a top-down view of IS projects and extend the applicability of ISSM.

## References

- Admiraal, W., & Lockhorst, D. (2009). E-learning in small and medium-sized enterprises across Europe-Attitudes towards technology, learning and training. *International Small Business Journal*, 27(6), 743-767.
- Altarawneh, H. (2011). A survey of e-learning implementation best practices in Jordanian Government Universities. *International Journal of Advanced Corporate Learning*, 4(2), 9-17.
- Barney, J. B. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 77(1), 99-120.
- Bharadwaj, A. (2000). A resource-based perspective on information technology capability and firm performance: An empirical investigation. *MIS Quarterly*, 24(1), 169-197.
- Carruth, J. (2007, Jun 24-25). Flying high. *E.learning Age*.
- Cenfetelli, R. T., & Bassellier, G. (2009). Interpretation of formative measurement in information systems research. *MIS Quarterly*, 33(4), 689-707.
- Cukusic, M., Alfirevic, N., Granic, A., & Garaca, Z. (2010). E-learning process management and the e-learning performance: Results of a European empirical study. *Computers & Education*, 55(2), 554-565.
- Chen, R.-S., & Hsiang, C.-H. (2007). A study on the critical success factors for corporations embarking on knowledge community-based e-learning. *Information Sciences*, 17(2), 570-586.
- Chou, S.-W. (2003). Computer systems to facilitating organizational learning: IT and organizational context. *Expert Systems with Applications*, 24(3), 273-280.
- Czerniewicz, L., & Brown, C. (2009). A study of the relationship between institutional policy, organisational culture and e-learning use in four South African universities. *Computers & Education*, 53, 121-131.
- DeLone, W. H., & McLean, E. R. (1992). Information systems success: The quest for the dependent variable. *Information Systems Research*, 3(1), 60-95.
- DeLone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of information systems success: A ten-year update. *Journal of Management Information Systems*, 19(4), 9-3.
- Elliott, R., & Clayton, J. (2009). *Critical success factors in e-learning for large enterprises*. Paper presented at the ALT-C, Manchester, England.
- Fratto, M. (2009). *2009 strategic security survey*. Retrieved from <http://i.cmpnet.com/>

custom/strategicsecurity/assets/InformationWeek\_Analytics\_2009\_Strategic\_Security\_Survey.pdf (accessed 22 July 2011).

- Freeze, R. D., Alshare, K. A., Lane, P. L., & Wen, H. J. (2010). IS success model in e-learning context based on students' perceptions. *Journal of Information Systems Education, 21*(2), 173-184.
- Garrity, E. J., & Sanders, G. L. (1998). Dimensions of information systems success. In E. J. Garrity & G. L. Sanders (Eds.), *Information systems success measurement* (pp. 13- 45). Hershey, PA: Idea Group Publishing.
- Garrity, E. J., Glassberg, B., Kim, Y. J., Sanders, G. L., & Shin, S. K. (2005). An experimental investigation of web-based information systems success in the context of electronic commerce. *Decision Support Systems, 39*(3), 485-503.
- Gold, M. (2003). E-learning, the Lucent way. *T + D, 57*(7), 46.
- Gold, M. (2003). Developing enterprise e-learning at Kodak. *T+D, 57*(6), 48.
- Hagen, J., Albrechtsen, E., & Johnsen, S. O. (2011). The long-term effects of information security e-learning on organizational learning. *Information Management & Computer Security, 19*(3), 140 - 154.
- Hall, J. H., Sarkani, S., & Mazzuchi, T. A. (2011). Impacts of organizational capabilities in information security. *Information Management & Computer Security, 19*(3), 155-176.
- Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares path modeling in international marketing. In R. R. Sinkovics & P. N. Ghauri (Eds.), *New challenges to international marketing* (Advances in international marketing) (Vol. 20, pp. 277-319). Emerald Group Publishing Limited.
- Kettinger, W. J., Park, S.-H. S., & Smith, J. (2008). Understanding the consequences of information systems service quality on IS service reuse. *Information and Management, 46*(6), 335-341.
- Khan, B. (2005). *Managing e-learning strategies: Design, delivery, implementation and evolution*. Hershey, PA: Information Science Publishing.
- Kulkarni, U. R., Ravindran, S., & Freeze, R. (2006-7). A knowledge management success model: Theoretical development and empirical validation. *Journal of Management Information Systems, 23*(3), 309 - 347.
- Lai, C.-Y., & Liou, W.-C. (2010). Implementation of e-learning and corporate performance-An empirical investigation. *International Journal of Advanced Corporate Learning, 3*(1), 4-10.

- Lai, M., Lin, Y., Lin, L., Wang, W., & Huang, H. (2009). Information behavior and value creation potential of information capital: Mediating role of organizational learning. *Expert Systems with Applications*, 36(1), 542-550.
- Liao, S.-H., & Wu, C.-c. (2010). System perspective of knowledge management, organizational learning, and organizational innovation. *Expert Systems with Applications*, 37(2), 1096-1103.
- Lu, X., Zhao, X., & Han, H. (2008). *Analysis on factors impacting to information system development*. Paper presented at the Future Information Technology and Management Engineering, FITME '08, Leicestershire, United Kingdom.
- Marshall, S. J., & Mitchell, G. (2005). *E-learning process maturity in the New Zealand tertiary sector*. Paper presented at the EDUCAUSE conference, Auckland, New Zealand.
- Martins, E. C., & Treblanche, F. (2003). Building organizational culture that stimulates creativity and innovation. *European Journal of Innovation Management*, 6(1), 64-74.
- McPherson, M., & Nunes, M. B. (2006). Organisational issues for e-learning: Critical success factors as identified by HE practitioners. *International Journal of Educational Management*, 20(7), 542-558.
- Mintzberg, H. (1971). Managerial work: Analysis from observation. *Management Science*, 18(2), 97-110.
- Morch, A. I., Engen, B. K., & Asand, H.-R. H. (2004). *The workplace as a learning laboratory: The winding road to e-learning in a Norwegian service company*. Paper presented at the eighth conference on Participatory design, Toronto, Ontario, Canada.
- Netteland, G. (2009). Implementation of e-learning in a large organization: The critical role of relevance to work. *International Journal of Advanced Corporate Learning*, 2(3), 58-65.
- Nichols, M. (2008). Institutional perspectives: The challenges of e-learning diffusion. *British Journal of Educational Technology*, 39(4), 598-609.
- Nyanchama, M. (2005). Enterprise vulnerability management and its role in information security management. *Information Systems Security*, 14(3), 29-56.
- O'Brien, E., & Hall, T. (2004). *Training needs analysis - The first step in authoring e-learning content*. Paper presented at the 2004 ACM symposium on Applied Computing, Cyprus, Nicosia.

- Opstal, D. (2007). *The resilient economy: Integrating competitiveness and security*. Council on Competitiveness. Retrieved from [http://www.compete.org/images/uploads/File/PDF/Files/Transform\\_The\\_Resilient\\_Economy\\_FINAL\\_pdf.pdf](http://www.compete.org/images/uploads/File/PDF/Files/Transform_The_Resilient_Economy_FINAL_pdf.pdf) (accessed 22 July 2011).
- Overton, L. (2007, Jun, 18-20). BT dials success. *E.learning Age*.
- Petter, S., & McLean, E. R. (2009). A meta-analytic assessment of the DeLone and McLean IS success model: An examination of IS success at the individual level. *Information & Management*, 46(3), 159-166.
- Pitt, L. F., Watson, R. T., & Kavan, B. C. (1995). Service quality: A measure of information system effectiveness. *MIS Quarterly*, 19(2), 173-187.
- Powell, T. C., & Dent-Micallef, A. (1997). Information technology as competitive advantage: The role of human, business and technology resources. *Strategic Management Journal*, 18(5), 375-405.
- Ravichandran, T., & Lertwongsatien, C. (2005). Effect of information systems resources and capabilities on firm performance: A resource-based perspective. *Journal of Management Information Systems*, 21(4), 237-276.
- Ray, G., Muhanna, W. A., & Barney, J. B. (2005). Information technology and the performance of the customer service process: A resource-based analysis. *MIS Quarterly*, 29(4), 625-652.
- Rossiter, D. (2007). Whither e-learning? Conceptions of change and innovation in higher education. *Journal of Organizational Transformation and Social Change*, 4(1), 93-107.
- Schreurs, J., Gelan, A., & Sammour, G. (2011). E-learning readiness in organisations-Case healthcare. *International Journal of Advanced Corporate Learning*, 2(2), 34-39.
- Sela, E., & Sivan, Y. Y. (2009). Enterprise e-learning success factors: An analysis of practitioners' perspective (with a Downturn Addendum). *Interdisciplinary Journal of E-Learning and Learning Objects*, 5, 335-344.
- Škerlavaj, M., Štemberger, M. I., Škrinjar, R., & Dimovski, V. (2007). Organizational learning culture-the missing link between business process change and organizational performance. *International Journal of Production Economics*, 106(2), 346-367.
- Škerlavaj, M., Song, J. H., & Lee, Y. (2010). Organizational learning culture, innovative culture and innovations in South Korean firms. *Expert Systems with Applications*, 37(9), 6390-6403.
- Sohal, A. S., Moss, S., & Ng, L. (2001). Comparing IT success in manufacturing and ser-

- vice industries. *International Journal of Operations & Production Management*, 21(1/2), 30-45.
- Tao, Y.-H. (2008). Typology of college student perception on institutional e-learning issues-An extension study of a teacher's typology in Taiwan. *Computers & Education*, 50(4), 1495-1508.
- Thong, J. Y. L. (2001). Resource constraints and information systems implementation in Singaporean small business. *Omega*, 29(2), 143-156.
- Thong, J. Y. L., Chee-Sing, T., & Raman, K. S. (1996). Top management support, external expertise and information systems implementation in small business. *Information Systems Research*, 7(2), 248-267.
- Wang, E. T. G., & Chen, J. H. F. (2006). Effects of internal support and consultant quality on the consulting process and ERP system quality. *Decision Support Systems*, 42(2), 1029-1041.
- Werlinger, R., Hawkey, K., & Beznosov, K. (2009). An integrated view of human, organizational, and technological challenges of IT security management. *Information Management & Computer Security*, 17(1), 4-19.
- Wu, J. H., & Wang, Y. M. (2006). Measuring KMS success: A respecification of the Delone and McLean's model. *Information and Management*, 43(6), 728-739.

## Appendix

## Measurement Items, Factor Loading, Error, T-Value, SMC

Construct (source)	Measurement items	Factor loading	Error	t-value	SMC
Top management support (Thong et al., 1996)	For the issues regarding to e-learning system, our top managers always				
	TMS1: attend project meetings	0.57	0.49	5.57	0.52
	TMS2: provide necessary resources	0.60	0.28	11.96	0.60
	TMS3: involve in information analysis	0.66	0.62	10.25	0.67
	TMS4: involve in decision-making	0.64	0.44	6.39	0.68
	TMS5: involve in monitoring project	0.90	0.45	7.09	0.54
Organizational learning culture (Chou, 2003)	In my organization, employees are				
	OLC1: willing to share their knowledge and expertise	0.89	0.35	4.85	0.57
	OLC2: encouraged to share their knowledge or creativity	0.79	0.83	5.27	0.65
	OLC3: discussing their problems and difficulties with other colleagues	0.74	0.21	4.55	0.56
	OLC4: competing with the other members of the organization	0.59	0.71	10.56	0.77
	OLC5: exchanging their working practices each other	0.66	0.53	5.60	0.77
	OLC6: Our organization is trying to transfer to a learning organization	0.46	0.21	7.14	0.75
Information security policy (Hall et al., 2011)	I think our information security policy				
	ISP1: maintains appropriate protection of information assets	0.73	0.37	8.86	0.58
	ISP2: achieves security compliance with legislation or industry requirements	0.70	0.32	4.77	0.57
	ISP3: responds promptly to information security attacks	0.74	0.21	4.45	0.47
	ISP4: recovers quickly from system failure or interruption	0.87	0.16	9.41	0.56
	ISP5: keeps information security risks to a minimum	0.71	1.01	7.56	0.61
	ISP6: allows for better control of information assets	0.82	0.82	10.12	0.65

Construct (source)	Measurement items	Factor loading	Error	t-value	SMC
Institutional policy (Tao, 2008)	I feel our institutional policy regarding to e-learning				
	ITP1: effectively integrates resources	0.91	0.85	8.54	0.51
	ITP2: accelerates the diffusion of e-learning among employees	0.71	0.41	4.89	0.52
	ITP3: promotes information exchange between employees	0.89	0.81	4.49	0.59
	ITP4: treats e-learning as a long-term investment strategy	0.35	0.92	3.44	0.55
System quality (Delone & McLean, 2003)	I am satisfied with our e-learning system in terms of				
	SQL1: availability	0.55	0.42	6.49	0.75
	SQL 2: reliability	0.59	0.33	3.87	0.88
	SQL 3: response time	0.83	0.39	10.95	0.57
	SQL 4: usability	0.92	0.56	4.90	0.52
	SQL 5: adaptability	0.85	0.45	6.80	0.52
System service (Kettinger et al. (2008)	I think our e-learning system				
	SSV1: provides the services I need	0.88	0.72	17.49	0.75
	SSV2: provides prompt service	0.59	0.33	19.87	0.88
	SSV3: staff are helpful	0.83	0.19	10.95	0.67
	SSV4: staff respond to my requests quickly	0.92	0.24	11.90	0.62
Organizational benefits (Hall et al., 2011)	I feel after implementing e-learning system, it				
	OGB1: increases customer trust	0.75	0.72	10.49	0.75
	OGB2: prevents costly legal action from government agencies and stockholders	0.59	0.33	10.87	0.88
	OGB3: preserves public's perception of brand strength or organizational reputation	0.83	0.19	6.95	0.67
	OGB4: improves customer service	0.92	0.46	3.90	0.52
	OGB5: preserves market valuation	0.87	0.67	6.45	0.53

## Exploring Learner to Content Interaction as a Success Factor in Online Courses



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### Abstract

Interaction plays a critical role in the learning process. For online course participants, interaction with the course content (learner-content interaction) is especially important because it can contribute to successful learning outcomes and course completion. This study aims to examine the relationship between learner-content interaction and course grade to determine if this interaction type is a contributing success factor. Data related to student interaction with course content, including time spent reviewing online course materials, such as module PowerPoint presentations and course videos and time spent completing weekly quizzes, were collected for students in three sections of an online course ( $N = 139$ ). The data were then correlated against grades achieved in the course to determine if there was any relationship. Findings indicate statistically significant relationships between the amount of time the learner spent with the content and weekly quiz grades ( $r = .-72$ ). The study concludes that learners who spent more time interacting with course content achieve higher grades than those who spent less time with the content.

**Keywords:** Interaction; online course; success; grades

## Introduction

As the number of online course offerings in higher education institutions continues to grow, research continues to try and determine educational success factors for learners participating in these courses. Interaction has been identified as an important factor affecting educational success in online courses (Tsui & Ki, 1996; Beaudodin, 2002). Prior to 1989, dimensions of interaction in online courses had yet to be defined. In his editorial in *The American Journal of Distance Education*, Moore (1989) closed this gap by identifying a three-dimensional construct that characterized interaction as either learner to content, learner to instructor, or learner to learner. Moore's framework has been widely accepted in the literature and has sparked extensive studies and empirical research on learner-instructor (Dennen, Darabi, & Smith, 2007; Garrison, 2005; Garrison & Cleveland, 2005; Garndzol & Grandzol, 2010) and learner-learner (Bain, 2006; Burnett, 2007) dimensions of interaction, but the learner-content interaction and how this impacts course success has not been a focus in the research. It can be deduced that part of the reason for this lack of attention is the fact that content is such a broad term and content interaction can vary widely depending on course structure, design, and format. Further, although course management systems (CMS) can track the amount of time a student spent online with the course open, it does not tell us if this time is truly spent reviewing course materials.

Although these challenges exist, researchers continue to discuss the importance of understanding learner-content interaction. Vrasida (2000) states that learner-content interaction is "the fundamental form of interaction on which all education is based" (p.2). Tuovinen (2000) calls learner-content interaction the most critical form of interaction because it is here that student learning takes place. To date, very few empirical studies have attempted to examine the role that learner-content interaction plays in course success outcomes. Because of the importance that a learner's interaction with course content plays in education, the body of research is incomplete without a deeper exploration of the impact that it has on course success. The academic and practitioner communities need rigorous studies that examine learner-content interaction.

To address these gaps in the literature, this study examined learner-content interaction as a contributing success factor for students in an online course. Using Moore's (1989) theory of interaction as a framework, this study contributes to our understanding of interaction by analyzing learner-content interaction through the dimensions of timing and quantity specifically for online courses. To support this purpose, three steps are presented. The first step is to review the recent online learning and interaction studies that shaped various interaction definitions and points of view. Next, two hypotheses that guided this research are explored empirically and an analysis of the results is discussed. Finally, implications for instructors and online course designers are provided.

## Purpose of the Study

The purpose of this study was to determine if there was a relationship between learner-content interaction and the course grades. In many courses, grades are the tangible evidence

of the quality and quantity of work completed. Therefore, grades were used as the tangible measurement of the course outcome in each part of the study. The study looked at the amount of time spent completing the quizzes and the total amount of time spent reviewing the content in the course for each student and correlated this information against grades achieved. It is hypothesized that the more time spent up front with content will decrease the amount of time needed to complete quizzes because students will be familiar with the information. Therefore

H1: The amount of time a student spends completing course quizzes will negatively correlate with the grade achieved on the quiz;

H2: Students who spend larger amounts of time with the overall course content (quantity of discussion postings read, total number of files read, and the total amount of time spent in the CMS reviewing overall content) will achieve higher final course grades than those who spend less time with the content.

## Online Courses

According to the Sloan Consortium (2011), of the 19.7 million students enrolled in college overall, 5.6 million (28.4%) college students in the continental United States reported taking at least one online course in 2010. This represented a 20% increase over the 2009 numbers. Online courses offer more flexibility, thus allowing for increased enrollment by the nontraditional college student. Some institutions offer degree programs where students never have to step foot on a traditional campus. With these types of course and degree program offerings on the rise, it is no surprise that the literature is saturated with research related to online learning.

Early studies sought to explore the legitimacy of online course learning by examining differences in learning outcomes for students taking online versus traditional courses (Hannay & Newvine, 2006; Mullen & Tallent-Runnels, 2006; Salter, 2003). Mullen and Tallent-Runnels (2006) used interviews to examine differences between online and traditional courses by focusing on instructor support, student motivation, and self-regulation, while Salter used an integrative literature review approach to study the same topic. Both studies suggested a slight difference in the formats themselves, but could not definitively state that one format or the other led to better learning outcomes. Other studies provided evidence suggesting that student achievement and perceived skill development were higher in online teaching formats (Hacker & Sova, 1998; Shneiderman, Borowski, Alavi, & Norman, 1998), while opposing studies suggested that no significant differences existed (Jones, 1999; Navarro & Shoemaker, 1999; Schulman & Sims, 1999). Again here, more successful learning outcomes could not be attributed to either format. For example, Hacker and Sova (1998) tested 43 students to determine if the efficacy of computer-mediated courses was significantly different from that of traditional university delivery methods. Twenty-two of the students were taught in a traditional lecture course and 21 were taught via the Internet in an online course. Results of this study showed the achievement gains were 15% higher for

students in the online course versus those participating in the traditional lecture course. Conversely, Navarro and Shoemaker (1999) in a similar study using 63 students (31 traditional, 32 online) found that there was no statistical difference in course achievement for students taking the same course online versus those taking it in the traditional setting. In both studies, GPAs and GMAT scores were similar in the online versus traditional students. Though the abovementioned studies suffered from small sample size, thus limiting the generalizability of the results, a key point noticed was online courses could not be counted out as a viable form of education in the higher learning arena.

In more recent research, there is agreement that no noticeable differences exist in learning outcomes for students who completed traditional versus online courses (Liu, 2008). However, a common thread found among all research streams discussed is that many of the conclusions drawn about the outcomes hinged on the amount and types of interaction that led to learning success for students taking online courses. This research provides a strong foundation for viewing all kinds of interaction as a factor affecting potential course outcomes, especially in online course formats.

## Interaction

Interaction in general has been discussed as central to the educational experience and a primary focus in the study of learning outcomes in online classes (Garrison & Cleveland-Innes, 2005). Prior to 1989, dimensions of interaction in educational courses had yet to be defined. Moore (1989) closed this gap by identifying a three-dimensional framework that characterized interaction as either learner-content, learner-instructor, or learner-learner. Learner-instructor interaction is communication between students and the instructor in a course, while learner-learner interaction is communication between the learner and peers in the same course. For online courses, this interaction can take place using both synchronous (video-conferencing, online chat sessions) and asynchronous (e-mail, discussion boards) methods (Kearsley, 1995). In its most basic definition, learner-content interaction refers to the time spent with course content including textbooks, PowerPoint, web pages, and discussion forums (Su, Bonk, Magjuka, Liu, & Lee, 2005).

Though Moore's (1989) theory of interaction can be applied to any educational format, more recent research using the framework has been related to online courses. This is an obvious direction because of the growing trend of online course offerings in higher education. As the learning forum moved from face-to-face classes to online courses, completeness of the three-dimensional construct began to come in question as the most comprehensive way to view interaction (Anderson, 1998; Hillman, Willis, & Gunawardena, 1994; Soo & Bonk, 1998; Tuovenin, 2000). To address these concerns, scholars began to revisit the original theory and additional dimensions of interaction were introduced. Hillman, Willis, and Gunawardena (1994) introduced learner to interface interaction as an additional dimension to the construct. Learner-interface suggests that for online courses, the learner has to interact with some form of technology medium as part of the course requirements. This interaction is crucial to the online experience because it enhances cognition and is the

interaction which makes online learning possible (Tuovinen, 2000). Learner to interface interaction has emerged as a fourth dimension to the interaction construct and has been explored theoretically and empirically in the literature (Dunlap, Sobel, & Sands, 2007; Jung & Choi, 2002; Rhode, 2009). From a theoretical perspective, Dunlap, Sobel, and Sands (2007) built a conceptual taxonomy of student to content interface interaction strategies. In it, they compared the cognitive interactions between the student and the technology to the cognitive dimensions of Bloom's taxonomy. Jung and Choi (2002) empirically tested learner to interface interaction with 124 participants in an online course. The study investigated the effect that learning in a web-based training (WBT) environment had on the students' satisfaction, participation, and attitude towards online learning. It was concluded that "regardless of the type of interaction, WBT experiences resulted in a more positive view of online learning" (Jung & Choi, 2002, p. 160). In both studies, the authors asserted that learner-interface interaction would help involve students in deep and meaningful learner-content interactions in online courses. At the core of these studies is the course structure and design of the course. These factors have increased importance when the ability for eye contact and direct conversation are removed from the learning process.

Because interaction with an interface can take on many complex forms within learner-interface interaction, subdimensions exist. Anderson (1998) introduced the teacher-content interaction, content-content, and teacher-teacher interaction as ways of examining challenges that instructors have with course technology. Teacher-content examines the structure and flexibility of the course. Unlike learner-content, this looks at how teachers connect with each other and use this connection to enhance their comfort in interacting with the course. This element also explores the role that professional development plays in the teaching of online classes. Anderson mentioned teacher-teacher interaction as a way of further enhancing the comfort level and recommends that teachers attend virtual conferences and other World Wide Web options to develop their comfort level with and knowledge of technology. Finally, content-content interaction is used to discuss the ways in which the course can be structured to have the CMS deliver the various types of content (PowerPoint, wikis, etc.) to students in the course.

Soo and Bonk (1998) also suggested learner-self interaction as an additional dimension. Learner-self interaction examines the learner's reaction to the content and asserts that their reflections and inner-dialogue (called "self-talk") are related to the learning process. Their study sought to clarify the interaction types that were essential to online learning and rank them in order of significance. Learner-self interaction is often treated as part of the learner-content dimension.

## Measuring Online Learning Outcomes

While there is general agreement in the literature on the validity of Moore's interaction framework, different scholars have presented different perspectives on interaction related to the success of learning outcomes. The literature revealed two main streams of thought related to how learning outcomes were measured in online courses. In the first stream,

scholars have placed more emphasis on the human interaction components and measured success in terms of learner satisfaction (Akyol & Garrison, 2011; Rhode, 2009). Learner satisfaction is closely related to learner perceptions and deals with cognitive viewpoints. It is deduced from the literature that this is a critical component because the way a learner processes the information in a course can be an outcome of the amount of learning they feel has taken place. Success in the course is measured by satisfaction with others and how much knowledge learners felt they took away from the course. From an alternate viewpoint, others have focused on the course structure and measured success in terms of the level of self-direction the learner takes in interacting holistically with the course content (Anderson, 1998; Song 2007). This lens focuses more on the way the learner completes the assignments and is tied more to their personal, intrinsic motivation to learn. With learner self-direction, cognition is still a factor, but the drivers for success are viewed as outcomes of interaction with the content. Success is measured in terms of the learner's motivation to interact and tangible outcomes such as course grades. These differing perspectives, along with names of authors related to the research, are summarized in Table 1 below.

Table 1

*Interaction and Learning Outcomes*

		Human interaction	Content interaction
Perspective	Description	Author	
Learner satisfaction	Success defined by interaction with others	Akyol, 2011	
	How learners feel is the main driver for success (thought-oriented)	Brooks, 2011 Burch, 2008	
	Perceptions represent based on survey are the qualitative and/or quantitative surveys are main data source	Burnett, et. al., 2007 Fisher, 2011 Garfield, 2012 Swinton, 2010	
	Success is defined by personal motivation to interact with the content		Anderson, 1998 Dennen, 2007
	How learners act is the main driver for success (action-oriented)		Garrison, 2005
	Qualitative and quantitative surveys and course grades are main data sources		Jung & Choi, 2002 Song, 2007

Though many factors can influence the way students perform in a course, interaction in some form has been shown to affect their feelings and thoughts on what has been learned. It is clear from the research that learner-content interaction is an important factor in successful learning outcomes for online courses. Despite the thoroughness of the studies discussed, it remains a fact that limited research exists to measure course success in terms of learner-content interaction. The literature has led to a proposed definition of content interaction, which is one major factor towards more research in this area. Additionally, the need for such studies has been put forth as necessary to fully understand the impact that learner-content interaction has on this stream of research.

## Methodology

### Study Design and Background

This study was carried out at a large higher education institution in the Southwestern United States. Students were enrolled in one of three sections of the same management course. All sections were taught during the same term using the same format and materials and by the same instructor. A total of 185 students was originally enrolled across the three sections but after the add-drop period, only 139 remained ( $N = 139$ ). The course was taught asynchronously using the Blackboard CMS, and students relied completely on materials posted online to complete the requirements. Students were required to complete both a discussion assignment and a five-question quiz each week. No make-ups were allowed for either. Students had a total of seven days between assignments. They were allowed to complete them at any point during the seven-day period. The content was made available to all students at the same time. There was no direct interaction between the author and the students during the term. All data were collected from the grade book or the statistical reports sections on the CMS. There were no synchronous meetings held during the semester.

Weekly quizzes were timed and learners had to complete the assessments during the allotted time to receive a grade. Students had the option to complete them using an open-book format. There were no mandatory requirements given to the students about the number of discussion postings they either needed to post or review, nor was any direction given by the instructor on the amount of time they should spend reviewing the PowerPoints and other course material provided each week.

### Data Collection and Analysis

Data on the quizzes were pulled and recorded from the CMS each week. This data included the amount of time spent completing the quiz and the grade achieved on the quiz. Since the quizzes were timed, there is confidence that the time that the students showed completing the quizzes was actually dedicated to this activity. At the end of the course, the total amount of time spent reviewing content (i.e., PowerPoints and course videos), the number of discussion postings reviewed by each student, the cumulative time spent completing quizzes, and the final grade were also recorded. The CMS system discussed in this study

automatically recorded the amount of time spent reviewing any of the content tied to the course upon access. For example, when a student opened one of the course videos, the CMS began recording time. The system stopped recording when a student closed the video and calculated the total time for that session. Data analysis was performed using the Statistical Package for the Social Sciences for Windows (SPSS ver. 20.0). Frequencies, descriptive statistics, and histograms were run to examine the distribution of the data. Visual inspection revealed no problems with normality, and there were no outliers. Data were analyzed using correlation and multiple regression analysis. The level of significance used for the analysis was .05.

## Results

Data were recorded each week on the amounts of time a student spent completing the weekly quiz and the grade received. This data was considered learner-content interaction for two reasons. First, the students were allowed to utilize an online textbook, PowerPoints, and videos when completing the quizzes, and, second, the quiz questions were derived directly from the online textbook, PowerPoints, and videos. For these reasons, it can be deduced that the amount of time the students spent reviewing the course content both before and during the quiz contribute to learner-content interaction and resulting outcomes. Correlation between the grade received on the quiz and the amount of time spent completing the quiz was  $-.716$ . This is statistically significant and means that the more time a student spent on the quiz, the lower the grade received. Grades achieved were higher for those students who completed the quiz in less time. Data is shown in Table 2.

To answer the question on whether there was a grade difference among students who spent more time reviewing overall course content, multiple regression analysis was performed, including descriptive statistics. The number of discussions posted was counted, and the total amount of time spent reviewing all content was tallied and recorded based on the CMS records. Results revealed that there was no statistical significance between the students but the frequency of passing grades (A, B, or C) was noticeably higher among students who spent more time reviewing the course content, indicating practical significance in this area. Statistical results of the analysis for hypothesis 2 is shown in Table 3 and frequency counts for each letter grade are shown in Table 4.

Table 2

*Correlation between Weekly Quiz Grade and Amount of Time Spent Completing the Quiz*

Descriptive Statistics			
	Mean	Std. deviation	N
Grade	4.3125	.60208	16
Time	2.8806	.45485	16

Correlations			
	Grade	Time	
Grade	Pearson correlation	1	-.716**
	Sig. (2-tailed)		.002
	N	16	16
Time	Pearson correlation	-.716**	1
	Sig. (2-tailed)	.002	
	N	16	16

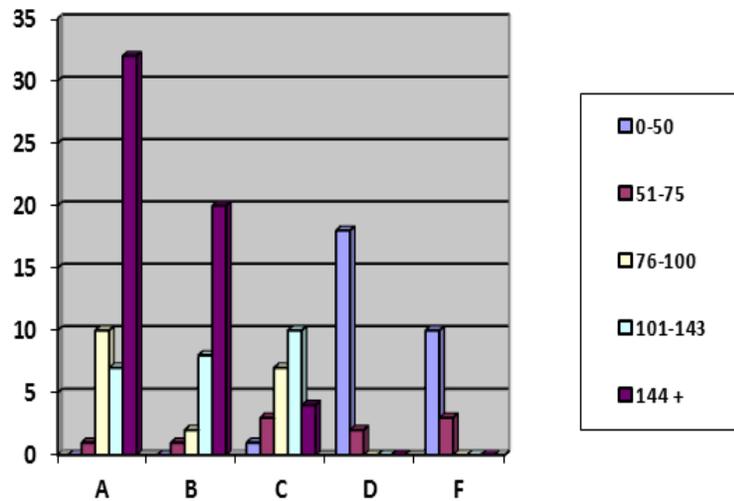
Table 3

*Regression Analysis for the Total Amount of Time Spent with Content and Final Course Grade*

Correlations				
		Grade	Postings	Time
Pearson correlation	Grade	1.000	-.185	-.190
	Postings	-.185	1.000	.176
	Time	-.190	.176	1.000
Sig. (1-tailed)	Grade	.	.015	.012
	Postings	.015	.	.019
	Time	.012	.019	.
N	Grade	139	139	139
	Postings	139	139	139
	Time	139	139	139

Table 4

*Comparison of Letter Grade Frequency Compared to Hours Spent Reviewing Content*



## Discussion and Limitations

Additional research will be needed to determine the full relationship between learner-content interaction and course success. However, the results of this study suggest that learners who interact with the content more frequently achieve higher success in online courses. The results of hypothesis 1 indicate that students who spent more time with the content overall required less time to complete the quiz. This supports the hypothesis and a strong statistical correlation was shown. Further, results of the initial correlations study related to the weekly quizzes revealed that those who spent less time completing the timed quizzes scored higher. This suggests that these students may have known the answers and thus did not need to search for them during the open book quiz. This assumption is supported by the fact that there was a higher frequency of passing grades achieved by students who spent more time overall with the content.

Implications for online course instructors lie in these findings. First, instructors are encouraged to discuss the importance of interacting with the content as a way to achieve success. Although this should be intuitive to most students, their perceptions of online courses might lead them to believe that the only requirements are the quizzes and potentially the book. Since online courses are often accompanied with additional content like blogs and PowerPoint lectures, this should be expressly discussed with the students. From a course design perspective, CMS designers should work to ensure that the content is easy to access and engaging. This could heighten the motivation that learners have to spend time with the materials.

This study is not without its limitations. First, the small sample size and the fact that all participants were in the same course limits the generalizability of this study. Also, the

quantitative nature of the study limited additional findings. For example, it is not known if students were actually reviewing content for the full amount of time that they were recorded as being “in class” based on the CMS. It is also not known what attributed to the quantity of discussion postings and why some students chose to participate more than others. In future studies, these limitations could be addressed by conducting a mixed-methods approach where student interviews or feedback surveys take place. For this study, interaction with the students was not possible so interviews and surveys were not completed. Future research should consider these limitations and care for them during empirical studies involving learner-content interaction.

## References

- Anderson, T., & Garrison, D.R. (1998). Learning in a networked world: New roles and responsibilities. In C. Gibson (Ed.), *Distance learners in higher education* (p. 97-112). Madison, WI.: Atwood Publishing.
- Akyol, Z., & Garrison, R. (2011). Understanding cognitive presence in an online and blended community of inquiry: Assessing outcomes and processes for deep approaches to learning. *British Journal of educational Technology*, *42*, 233-250.
- Bain, Y. (2006). Do online discussions foster collaboration? Views from the literature. *PIC-TAL* (pp. 1-11). Aberdeen: PICTAL Conference Proceedings.
- Dennen, V. P., Darabi, A. A., & Smith, K. J. (2007). Instructor-learner interaction in online courses: The relative perceived importance of particular instructor actions on performance and satisfaction. *Distance Education*, *28*, 65-79.
- Dunlap, J. C., Sobel, D., & Sands, D. I. (2007). Designing for deep and meaningful student to content interactions. *Tech Trends*, *51*, 20-31.
- Garrison, D. R. (1993). A cognitive constructivist view of distance education: An analysis of teaching-learning assumptions. *Distance Education*, *14*, 199-211.
- Garrison, D. R., & Cleveland-Innes, M. (2005). Facilitating cognitive presence in online learning: Iteration is not enough. *American Journal of Distance Learning*, *19*, 133-148.
- Grandzol, C. J., & Grandzol, J. R. (2010). Interaction in online courses: More is not always better. *Online Journal of Distance Learning Administration*, *13*, 1-18.
- Hacker, R., & Sova, B. (1998). Initial teacher education: A study of the efficacy of computer mediated courseware delivery in a partnership context. *British Journal of Educational Technology*, *29*, 3312-3341.
- Hannay, M., & Newvine, T. (2006). Perceptions of distance learning: A comparison of online and traditional. *Journal of Online Learning and Teaching*, *2*(1), 1-6.
- Hillamn, D. C., Willis, D. J., & Gunawardena, C. N. (1994). Learner-interface interaction in distance education: An extension of contemporary models and strategies for practitioners. *The American Journal of Distance Education*, *8*(2), 30-43.
- Jones, E. (1999). *A comparison of all web-based class to a traditional class*. Texas: ERIC Document Reproduction Service.
- Jung, I., & Choi, S. (2002). Effects of different types of interaction on learning achievement, satisfaction and participation in web-based instruction. *Innovations in Education and Teaching International*, *39*(2), 153-162.

- Kearsely, G. (1995). The nature and value of interaction in distance learning. *Distance Education, 12*, 83-92.
- Liu, Y. (2008). Effects of online instruction vs. traditional instruction on students' learning. *International Journal of Instructional Technology and Distance Learning, 2*(3), 57-65.
- Moore, M. G. (1989). Three types of interaction. *American Journal of Distance Education, 3*(2), 1-7.
- Mullen, G. E., & Tallent-Runnels, M. K. (2006). Student outcomes and perceptions of instructors' demands and support in online and traditional classrooms. *The Internet and Higher Education, 9*, 257-266.
- Navarro, P., & Shoemaker, J. (1999). The power of cyberlearning: An empirical test. *Journal of Computing in Higher Education, 11*, 33-46.
- Rhode, J. F. (2009). Interaction equivalency in self-paced online learning environments: An exploration of learner preferences. *International Review of Research in Open and Distance Learning, 10*(1), 1-23.
- Salter, G. (2003). Comparing online and traditional teaching-a different approach. *Campus-Wide Information Systems, 20*, 137-145.
- Schulman, A. H., & Sims, R. L. (1999). Learning in an online format vs. an in-class format: An experimental study. *T.H.E. Journal, 26*, 54-56.
- Shneiderman, B., Borkowski, E., Alavi, M., & Norman, K. (1999, January 26). *Emergent patterns on teaching/learning in electronic classrooms*. Retrieved from Electronic Classrooms: <ftp://ftp.cs.umd.edu/pub/hcil/Reports-Abstracts-Bibliography/98-04HTML/98-04.html>
- Song, L. (2007). A conceptual model for understanding self-directed learning in online environments. *Journal of Interactive Online Learning, 6*, 27-42.
- Soo, K. S., & Bonk, C. J. (1998). Interaction: What does it mean in online distance education? *ED Media & ED-Telecom*. Frieburg, Germany.
- Su, B., Bonk, C. J., Magjuka, R. J., Liu, Z., & Lee, S.-h. (2005). The importance of interaction in web-based education: A program-level case study of online MBA courses. *Journal of Interactive Online Learning, 4*, 1-19.
- Torraco, R. J. (2005). Writing integrative literature reviews: Guidelines and examples. *Human Resource Development Reviews, 4*, 356-367.
- Tuovinen, J. E. (2000). Multimedia distance education interactions. *Education Media International, 37*(1), 16-24.

Vrasidas, C. (2000). Constructivism versus objectivism: Implications for interaction, course design, and evaluation in distance education. *International Journal of Educational Telecommunications*, 6, 339-362.

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# Assumptions and Challenges of Open Scholarship



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## Abstract

Researchers, educators, policymakers, and other education stakeholders hope and anticipate that openness and open scholarship will generate positive outcomes for education and scholarship. Given the emerging nature of open practices, educators and scholars are finding themselves in a position in which they can shape and/or be shaped by openness. The intention of this paper is (a) to identify the assumptions of the open scholarship movement and (b) to highlight challenges associated with the movement’s aspirations of broadening access to education and knowledge. Through a critique of technology use in education, an understanding of educational technology narratives and their unfulfilled potential, and an appreciation of the negotiated implementation of technology use, we hope that this paper helps spark a conversation for a more critical, equitable, and effective future for education and open scholarship.

**Keywords:** Openness; open scholarship; digital scholarship

## Assumptions and Challenges of Open Scholarship

Openness in a variety of educational and scholarly practices has gained wide interest and attention in recent years (Wiley, 2006; Wiley & Hilton, 2009). Activities associated with openness are often envisioned to occur within widely accessible online venues such as social media, and might include such activities as open teaching, the production and dissemination of open educational resources, publishing in open access journals, keeping a professional blog, and sharing of research data in online venues. In this paper, we will use the term *open scholarship* to refer to teaching and research practices that espouse openness and we will refer to those scholars who participate in such practices as being part of the *open scholarship movement*.

Many scholars hope and anticipate that open practices will broaden access to education and knowledge, reduce costs, enhance the impact and reach of scholarship and education, and foster the development of more equitable, effective, efficient, and transparent scholarly and educational processes. Wiley and Green (2012, p. 88) note that “only time will tell” whether practices of open scholarship will transform education or whether the movement “will go down in the history books as just another fad that couldn’t live up to its press.” Given the emerging nature of such practices, educators are finding themselves in a position in which they can shape and/or be shaped by openness (Veletsianos, 2010). The intention of this paper is (a) to identify the assumptions of the open scholarship movement and (b) to highlight challenges associated with the movement’s aspirations of broadening access to education and knowledge. The goal of this paper is not to frame open scholarship as a problematic alternative to the status quo. Instead, as we see individuals, institutions, and organizations embrace openness, we have observed a parallel lack of critique of open educational practices. We find that such critiques are largely absent from the educational technology field, as members of the field tend to focus on the promises of educational technologies, rarely pausing to critique its assumptions. Selwyn (2011b, pp. 713) even charges that our field’s inherent positivity “limits the validity and credibility of the field as a site of serious academic endeavour.” Our intention is to spark a conversation with the hopes of creating a more equitable and effective future for digital education and scholarship. To this end, this paper is divided into three major sections. First, we review related literature to introduce the reader to the notion of open scholarship. Next, we discuss the assumptions of openness and open scholarship. We then identify the challenges of open scholarship and discuss how these may limit or problematize its outcomes.

## Review of Related Literature

We view *open scholarship* as a collection of emergent scholarly practices that espouse openness and sharing. Boyer’s (1990) framework of scholarship is often used as a starting point for defining scholarly practices in the digital age, and a number of authors have sought to update Boyer’s model to reflect contemporary thinking related to scholarly practice (e.g., Garnet & Ecclesfield, 2011; Heap & Minocha, 2012; Pearce et al., 2010; Weller, 2011). Nonetheless, there appears to be little consensus in the field about what exactly constitutes open

scholarship. In this paper, we take an inclusive approach to open scholarship and consider it to take three major forms: (1) open access and open publishing, (2) open education, including open educational resources and open teaching, and (3) networked participation. In our previous work, we have discussed networked participatory scholarship, which is the third component of open scholarship and refers to scholars' uses of online social networks to share, critique, improve, validate, and enhance their scholarship (Veletsianos & Kimmons, 2012). We are taking an inclusive approach to open scholarship because we believe that this is reflective of current scholarly practice. All three manifestations noted above are instances of open scholarship, but they are enacted or made visible in different forms. Within our frame of understanding, open scholarship is a set of phenomena and practices surrounding scholars' uses of digital and networked technologies underpinned by certain grounding assumptions regarding openness and democratization of knowledge creation and dissemination.

Next, we discuss what open scholarship has come to look like and by laying out some of the core, shared assumptions of these manifestations, we will provide the groundwork for a discussion related to limitations, problems, or unaddressed issues within the open scholarship movement.

## What Does Open Scholarship Currently Look Like?

Discussions of openness gained traction after Friedman (2005) argued that digital technologies and open sourcing of software had helped to connect knowledge centers across the globe, thereby “flattening” the world and helping to create an even playing field between nations, groups, and individuals in a variety of ways (e.g., economics, research, etc.). More recently, Bonk (2009) built upon this idea and argued that digital technologies are specifically acting to democratize the education process. He argues that “anyone can now learn anything from anyone at anytime” and believes that this shift in the educational milieu offers a “new hope for educating citizens of this planet” (pp. 7–8). Similarly, proponents of the open scholarship movement have argued that by participating with emerging technologies, scholars can help to democratize knowledge production and dissemination via public online venues such as blogs and social networking sites. For example, Kumashiro et al. (2005) suggested that “technological changes are going to flood how we currently think about, do, and represent research” (p. 276), Greenhow, Robelia, and Hughes (2009) posited that “participatory internet technologies... have the potential to change the way academics engage in scholarship” (p. 252), and Garnett and Ecclesfield (2011) argued that social media could empower scholars to “co-create” knowledge through networks.

These observations and projections have taken form in a variety of emergent open practices amongst scholars, including (1) publishing in open access journals and submitting publications and data to institutional or national repositories; (2) maintaining digital presence via blogs, microblogs, personal Web sites, and social networking sites; and (3) providing and making use of open educational resources and leading and engaging in open courses and open teaching practices. We give a brief overview of each of these and then discuss some

underlying assumptions and characteristics that they share.

## Open Access Journals and Institutional Repositories

As increasing numbers of print media are being replaced by digital equivalents and as issues of copyright infringement and illegal sharing become more common, scholars have begun questioning the traditional publication process and sharing their work more freely through online venues. Open access (OA) publishing has grown rapidly over the last fifteen years (Laakso et al., 2011), and OA journals have quickly arisen as

- an option for scholars to publish their work so that anyone with an Internet connection can access scholarly work without facing traditional financial, legal, or technical barriers;
- a means for limiting potentially abusive publisher behaviors; and
- a way of returning control of scholarly work to the authors (c.f. Furlough, 2010; Wiley & Green, 2012).

Researchers have also found open access to be financially prudent for universities and institutions interested in starting a journal (Getz, 2005; Houghton & Sheehan, 2006) and have found that OA journals may produce a greater impact (in terms of readership and citations) than non-open access (NOA) journals (Brody & Harnad, 2004; Evans, 2008; Evans & Reimer, 2009; Eysenbach, 2006; Getz, 2005; Kurtz & Brody, 2006; Lawrence, 2001; Lewis, 2006; Norris et al., 2008). Further, researchers have found that some OA journals can attain a high level of impact within just a few years of launch and that OA journal articles are twice as likely to be cited as their NOA peers (Brody & Harnad, 2004; Kurtz & Brody, 2006).

Though a causal relationship between a journal's impact and its OA status alone is not supported by research findings (Craig et al, 2007; Davis, 2006; Davis & Fromerth, 2007; Gargouri et al., 2010; Henneken et al., 2006; Moed, 2006) and "OA will not make an unuseable (hence unciteable) paper more used and cited" (Gargouri et al., 2010, p. 18), it becomes clear that "wherever there are subscription-based constraints on accessibility, providing OA will increase the usage and citation of the more useable and citeable papers" (Gargouri et al., 2010, p. 18). As a result, Getz (2005, p.17) anticipates that such increased usage may lead to scholarship being "of wider influence in our society and across the planet," forecasting that "[open scholarship] researchers are likely to be more productive and students will learn more by using open scholarship" and that "within ten years, open journals are likely to dominate scholarly communication." Empirical evidence from Hajjem, Harnad, and Gingras (2005) supports this argument, as these authors found that 1.3 million NOA papers in ten disciplines that were self-archived between 1992 and 2003 have had more citations than papers that were not self-archived.

In addition to OA publications, many scholars have found benefit in sharing their data and manuscripts via institutional or national repositories in hopes of improving research and development (Houghton et al., 2009; Lynch, 2003) and making tax-funded research (often

conducted by public universities) available to the public (Kuchma, 2008). Ukraine, for instance, has moved to a mandated OA system for all publicly funded research, and there has been similar interest in the United States (Kuchma) and in projects funded by the European Union (European Commission, 2012).

## Digital Presence through Blogs, Microblogs, Personal Web Sites, and Social Networking Sites

Web 2.0 technologies have helped to make Web site creation and self-publishing seamless and easy, contributing to an increasing incidence of individual presence online. A simple web search will reveal personally maintained Web sites or blogs for a number of education scholars, prominent and emerging alike. In addition, social networking sites (SNS) have recently risen in popularity to such an extent as to make platforms like Facebook, Twitter, and LinkedIn common household and editorial topics. A recent survey in the United States by the Pew Internet & American Life Project (Hampton et al., 2011) for example reports that 39% of adult Internet users (30+ years of age) currently use an SNS and that on a typical day 25% of all adult internet users utilize an SNS. Such data are not limited only to the US. In Canada for example, about 60% of individuals who use the Internet have a profile on an online social networking site (Ipsos, 2011). Higher education faculty have also adopted SNS in growing numbers. Moran, Seaman, and Tinti-Kane (2011), for instance, found that amongst nearly two thousand higher education faculty surveyed, well over 90% were at least aware of the major SNS and over 50% of all surveyed visited Facebook in the previous month, with over 40% posting something to the SNS in that time.

Use of these digital spaces may reflect an interest in having debate platforms for scholars who seek to live as public intellectuals, recording and sharing logs of research, or offering spaces around which critical discussions of the scholarly enterprise can occur (Kirkup, 2010; Walker, 2006). By maintaining a web presence, scholars may express their opinions, solicit feedback, reflect, share information pertaining to their professional practice, network with colleagues, reach multiple audiences, and cultivate their identity as scholars (Veletsianos, 2012; Kjellberg, 2010; Martindale & Wiley, 2005; Nardi, Schiano, & Gumbrecht, 2004).

While scholars have also considered the pedagogical value of SNS within the classroom (Veletsianos & Navarrete, 2012b; Bull et al., 2008; Greenhow & Robelia, 2009a, 2009b; Mazer et al., 2007; Mazer et al., 2009; Munoz & Towner, 2009), in a survey conducted by Moran et al. (2011), it was found that 45% of higher education respondents use Facebook for professional, non-classroom purposes. Such nonclassroom uses of SNS may reflect an interest in online social grooming or using online tools as “a means to improve one’s reputation and status as well as access to resources and social and practical solidarity” (Tufekci, 2008, p. 546) and are indicative of a larger cultural movement toward online culture building and connection such that, for many scholars, it may now be “hard to think of a life offline” (Beer, 2008, p. 521).

Nevertheless, the tendency to use SNS in organized professional contexts appears to be lim-

ited. For example, online science-related journals that have experimented with community commenting platforms to support scholarly discussion around articles have exhibited a low volume of comments (Neylon & Wu, 2009), suggesting that though culturally we have come to use SNS for a variety of purposes, enthusiasm for these media has not fully carried over to professional scholarly purposes.

## Open Educational Resources, Open Teaching, and Open Courses

The open educational resources (OER) and open teaching movements seek “to provide open access to high quality digital educational material” (Caswell, et al., 2008) in a “spirit similar to that of free and open software” (Wiley, 2003 ¶9) and OA journals. UNESCO (2002) defines OER as “the open provision of educational resources, enabled by information and communication technologies, for consultation, use and adaptation by a community of users for non-commercial purposes” (p. 22), and OECD (2007) defines OER as “digitised materials offered freely and openly for educators, students and self-learners to use and reuse for teaching, learning and research” (p. 10). Major projects and examples that could fall under the umbrella of OER include OER Commons, MIT OpenCourseWare, the Wikimedia Foundation, Project Gutenberg, Creative Commons, Flat World Knowledge, and Saylor.org. Though there is no universally accepted definition of what constitutes OER, the overarching characteristics of OER are “resources that reside in the public domain or have been released under an intellectual property license that permits their free use or re-purposing by others” (Atkins, Seely Brown, & Hammond, 2007, p. 4). The OER movement has gained worldwide attention as a wide variety of governmental, institutional, and philanthropic organizations have adopted OER policies and have supported OER development (Hoosen, 2012), and it is believed that such practices have the potential to provide “individuals who might otherwise never have the opportunity to experience post-secondary learning a free and open chance to participate” (Wiley & Green, 2012, p. 88). Though still in its infancy, the OER movement has exhibited some positive outcomes (Wiley, 2010) though not necessarily a “discernable impact” (Wiley, Hilton, Ellington, & Hall, 2012). For instance, an exploratory investigation of open textbook adoption in the state of Utah by Wiley et al. (2012) found significant cost reductions that were accompanied by no significant changes in learning outcomes as measured by standardized test scores.

Closely related to the OER movement is the practice of creating open courses that a number of faculty members and universities have begun adopting. Similar to MIT’s OpenCourseWare project, numerous universities have made available course materials to the public in the form of syllabi, video lectures, audio recordings, course notes, presentation files, and other learning objects. Building off of this idea, institutions have also recently begun offering a type of free online course referred to as massive open online courses (MOOCs). In these courses, primary activities emphasize connected learning through active aggregation of information, “remixing” aggregated information through building relations to earlier experiences, repurposing information by generating digital artifacts, and sharing (Kop & Fournier, 2010). The major difference between MOOCs and OER is that the former are intended to serve as online learning environments that support learners in the edu-

cational process (e.g., providing feedback, completing assignments, sharing information, etc.), rather than merely making content available to them. As Fini (2009) explains, “open online courses may be considered to be a special type of OER, which solves the problem of the lack of interaction that is typical of most OER initiatives,” and “the real potential of an OOC [open online course] is to be found in the emergence of learning networks among participants in a many-to-many relationship, rather than the traditional one-to-many model of interactions between a teacher and his or her students” (p. 3). Prominent examples of MOOCs include the Connectivism and Connective Knowledge (CCKo8) course offered by Siemens and Downes (2008), Jim Groom’s (2011) Digital Storytelling course (#ds106) at the University of Mary Washington, Thrun and Norvig’s (2011) Introduction to Artificial Intelligence course at Stanford, MITx’s Circuits and Electronics course (2012), and the courses offered by educational startups such as Coursera, Udacity, and EdX.

### What Do these Practices Say about Open Scholarship?

Given these examples of open scholarship, we should be able to recognize some common themes and assumptions about openness, sharing, and Internet technologies that unite such practices. First, *open scholarship has a strong ideological basis rooted in an ethical pursuit for democratization, fundamental human rights, equality, and justice*. As the Budapest Open Access Initiative (2002) explains, the aim of openness is “building a future in which research and education in every part of the world are ... more free to flourish,” thereby reflecting ideals of democracy, free speech, and equality. Caswell, Henson, Jensen, and Wiley (2008) further explain this ideological basis with a statement of belief:

We believe that all human beings are endowed with a capacity to learn, improve, and progress. Educational opportunity is the mechanism by which we fulfill that capacity. Therefore, free and open access to educational opportunity is a basic human right, ... [and] we have a greater ethical obligation than ever before to increase the reach of opportunity. (p. 26)

Directing these desires for ensuring basic human rights, transparency, and accountability is a sense of justice or fairness in scholarly endeavors. Based on this ideological foundation, openness and sharing in scholarship are seen as fundamentally ethical behaviors that stand as moral requirements for any who value ideals of democracy, equality, human rights, and justice.

Second, *open scholarship emphasizes the importance of digital participation for enhanced scholarly outcomes*. Arguments for openness tend to focus on addressing the shortcomings and limitations of current institutionalized practices through faculty participation in online spaces. For instance, Greenhow, Robelia, and Hughes (2009, p. 253) argue that Web 2.0 “tools might positively affect—even transform—research, teaching, and service responsibilities—only if scholars choose to build serious academic lives online, presenting

semipublic selves and becoming more invested in and connected to the work of their peers and students.” Throughout these arguments for openness, the undesirable alternative is depicted as being “closed” or unresponsive to calls for equity, sharing, and transparency.

Third, *open scholarship is treated as an emergent scholarly phenomenon that is co-evolutionary with technological advancements in the larger culture*. Though ideals espoused in the first assumption are not new developments, their reintroduction into and re-emphasis in discussions of scholarship come in conjunction with the development and diffusion of a variety of social technologies. As Wiley and Green (2012) point out, open practices “allow the full technical power of the Internet to be brought to bear on education” (p. 82), and though causal relationships between technology developments and social trends are multidimensional, historical precedents suggest that social trends evolve in conjunction with technology development in a negotiated and co-evolutionary manner (cf. Veletsianos & Kimmons, 2012; Binkley, 1935). Thus, when discussing openness in scholarship, technology must be seen as both being an actor (i.e., influencing changes in scholarly culture and thereby influencing cultural behaviors) and being acted upon (i.e., being influenced by scholarly and other cultures and thereby reflecting cultural behaviors).

Finally, *open scholarship is seen as a practical and effective means for achieving scholarly aims that are socially valuable*. Such aims might range from ideological values (as mentioned above) to a variety of others including reduced cost of delivery, improved efficiency, greater accuracy, and so forth. For instance, one argument in favor of OA journals is that “the cost savings alone are likely to be sufficient to pay for open access journal publishing or self-archiving, independent of any possible increase in returns to R&D that might arise from enhanced access” (Houghton et al., 2009, p. XIX). Similar arguments have been made about improved research efficiency in sharing data sets (Trinidad et al., 2010), increasing the reach of universities via MOOCs (Carson & Schmidt, 2012), and using SNS for research purposes (Greenhow, 2009). Considering an educational perspective, such efficiency may also have pedagogical value because as Wiley and Green (2012) argue, “Education is a matter of sharing, and ... [open practices] enable extremely efficient and affordable sharing” (p. 82). In their view, “those educators who share the most thoroughly of themselves with the greatest proportion of their students” are seen as successful (p. 82). From this perspective, openness is seen as an effective vehicle for achieving various scholarly goals like affordability, efficiency, accuracy, accessibility, sustainability, dissemination, and effective pedagogy.

## The Need for a Critical Examination of our Practices

Empirical findings on researchers’ and instructors’ digital, networked, and open participation and practices have so far been minimal and have largely indicated that the use of participatory technologies for learning and scholarship is rife with tensions rather than realized transformative potential (Veletsianos & Kimmons, in press; Selwyn 2011a). Still, although we may have an early understanding of why individuals may not engage in open practices, we have not paused to examine potential unintended consequences of embracing activities associated with open scholarship.

A few reasons have already been proposed in the literature that may describe why scholars might not engage with digital scholarship. First, higher education faculty may be more inclined to use “traditional” technologies in their practice, such as email, than students (Roblyer, McDaniel, Webb, Herman, & Witty, 2010), and thereby may not necessarily capitalize on networked opportunities for scholarship. A second reason may be due to the relative newness of the concept of open scholarship and specialized social media tools targeting scholars, as social networking sites for academics (e.g., Mendeley and Academia.edu) have only been available since about 2007. As with every emerging technology used in education, it takes time for these tools to be evaluated, adopted, and appropriated into wide practice (Veletsianos, 2010). Finally, Zaugg, West, Tateishi, and Randall (2011, p. 32) argue that widespread use of such tools may be hindered because scholars might (a) perceive social media as an unnecessary time commitment and (b) “hesitate to openly post their developing research lest they get pre-empted by another researcher or receive public criticism for their still-evolving research.”

However, we see a pressing need for a critical examination of open scholarly practices, because the dominant educational technology narratives embraced in the field present an overwhelmingly positive picture of technology use in education that we believe is detrimental to our future. The promise of technology revolutionizing education has persisted since the 1930s (Mishra, Koehler, & Kereluik, 2009), though contemporary narratives may include “Web 2.0 technology as user-generated and hence emancipatory, or of learning analytics as allegedly leading to efficient, personalised teaching and learning, or of technology as implicitly progressive” (Hall, 2011, ¶14). Selwyn (2011b) even charges that, as a field, we *need* to be more negative to be taken more seriously. We believe that it is through (a) critiques of technology use in education, (b) an understanding of educational technology narratives and their unfulfilled potential, and (c) an appreciation of the complex and negotiated implementation of technology use ‘on the ground’ that our field will become a site of evaluative, rather than optimistic, discourse about the relationship between technology, education, and scholarship. In the words of Hall (2011, ¶11), “in order to understand our present position, and to develop alternatives that matter, we need stories and metaphors and critiques of where we are.”

## Researcher Positionality

Prior to explaining the challenges facing openness and open scholarship, it is important to clarify our position with respect to these issues so that the reader better understands our frame of reference and the validity of our arguments. Both authors are actively involved in researching emerging technologies (e.g., social media), technology-enhanced scholarship, and emerging forms of learning and participation. In addition, we both believe that various degrees of openness are worthwhile for scholars and educators, and we practice openness in our own work through our own blogs, our participation in social media, our sharing of OER, our publishing in open access journals when we feel a journal is appropriate for our work, and our self-archiving of our publications in ways that allow others to access them in an open manner. We also recognize that open scholarship challenges cultural, social, publishing, and institutional norms, thereby facing institutional obstacles and contesting

corporate interests. Finally, we also believe that the relationship between technology and practice is negotiated in that technology shapes practice and practice shapes the way technology is used. This belief provides part of the impetus for writing this paper as we believe that technologies shape the ways we enact openness while at the same time our beliefs, understanding, and actions pertaining to openness will shape how we use technology.

## Challenges of Openness and Open Scholarship

In the preceding sections, we highlighted some core assumptions of the open scholarship movement. While we believe that open scholarship tackles deficiencies, injustices, and problems of the status quo, it is imperative to clarify its pitfalls and challenges so that educators, researchers, and administrators can consider and address them. We discuss these issues in detail below in the context of each assumption. Table 1 summarizes these challenges with respect to each assumption.

Table 1

### *Assumptions and Challenges facing Open Scholarship*

Common themes and assumptions	Challenges
Open scholarship has a strong ideological basis rooted in an ethical pursuit for democratization, fundamental human rights, equality, and justice	Are these ideals essential components of the open scholarship movement or are they merely incidental to those who are pioneering the field?
Open scholarship emphasizes the importance of digital participation for enhanced scholarly outcomes	Scholars need to develop an understanding of participatory cultures and social/digital literacies in order to take full advantage of open scholarship.  Need to redesign university curricula to prepare future scholars to account for the changing nature of scholarship.
Open scholarship is treated as an emergent scholarly phenomenon that is co-evolutionary with technological advancements in the larger culture	Technology both shapes and is shaped by practice.  Technology is not neutral, and its embedded values may advance tensions and compromises (e.g., flat relationships, homophily, filter bubbles).
Open scholarship is seen as a practical and effective means for achieving scholarly aims that are socially valuable	Open scholarship introduces new dilemmas and needs (e.g., personal information management challenges; social stratification and exclusion).

## Assumption #1: Ideals of Democratization, Human Rights, Equality, and Justice

Though few would argue against framing practices around ideals such as democratization, human rights, equality, and justice, it is presently unclear whether these ideals are essential components of the open scholarship movement or are merely incidental to those who are pioneering the field. That is, at the moment, such scholarly practices may largely reflect the values of early adopters who already engage in them, and these values may not be held as inviolate, or even important, by others who begin replicating them. For example, Cohen (2007, ¶4) presents a list of fourteen characteristics that describe “social scholars” (e.g., “a social scholar initiates or joins an online community devoted to her topic, using any of a number of social software services or tools”). Burton (2009, ¶5) describes the “Open Scholar” as someone who “makes their intellectual projects and processes digitally visible and who invites and encourages ongoing criticism of their work and secondary uses of any or all parts of it—at any stage of its development.” In both of these descriptions, there is no clear necessity for the scholar to value democratization, human rights, equality, and so on, and we should consider the possibility that scholars engage in open scholarly practices for a variety of reasons that may not be entirely noble (Veletsianos, 2012).

While open scholarly practices may share some of these noble goals (e.g., providing access to scholars who could not otherwise afford access to recently published research), scholars and institutions need to evaluate the purposes and functions of scholarship and take part in devising systems that reflect and safeguard these values of scholarly inquiry. For instance, the development of OA journals that charge authors (and by extension their institutions) to publish their manuscripts limits the diversity of voices in the scholarly process to those able to pay for publication. As with those in any community, scholars engaging in open scholarship are susceptible to the risks of making decisions about the future of their community which may be arbitrary, prejudiced, or otherwise harmful to the community’s well-being, and, thus, scholars should be vigilant and reflective of their digital and open practices as these practices continue to emerge and develop. Such vigilance should focus both on determining who profits from such practices and who is excluded from them so as to combat both under-use by some (e.g., those lacking entry to or knowledge of useful networks) and over-use or exploitation by those with the wealth, power, and prestige necessary to effectively strip mine sources (c.f. Chander & Sunder, 2004). While solutions to these problems may not be simple, forward-thinking approaches to proactive prevention with regard to the protection of scholarly freedom, and the upholding of these early-adopted ideals, are superior to *post facto* reparation.

To illustrate further, massive open online courses (MOOCs) were originally designed as moral imperatives and alternatives to traditional higher education, as attempts to offer free education that was co-created with learners (McAuley, Stewart, Siemens, & Cormier, 2010). In this formulation, MOOCs were flexible enough to offer self-directed learners the ability to define for themselves the types of outcomes they desired, while at the same time offering opportunities for communal learning (Rodriguez, 2012). During 2011-2012, we saw bur-

growing interest in distance education by entrepreneurs, investors, and universities, and a resulting appropriation of MOOCs followed, such that the original MOOCs offered by Siemens, Downes, Cormier vis-à-vis the ones popularized by initiatives such as Coursera and Udacity share little resemblance other than the fact that they are freely available online courses. While the mass media celebrated the disruptive nature of online education and the death of higher education institutions (e.g., see McKenna, 2012 in *The Atlantic*, and Lewin, 2012 in the *New York Times*), a potential future defined by Coursera- and Udacity-type courses contrasts starkly with the narrative of MOOCs as flexible and empowering courses.

Many contemporary MOOCs can be more appropriately described as commodified education, rather than the type of open education initiatives suggested by their acronym. A clear example of this commoditization can be found in the rapid adoption of business-oriented models of distance education. While the intention of distance education enthusiasts and scholars from the inception of the field was to devise approaches to provide learning opportunities to individuals who could not otherwise physically attend educational institutions, such as learners who live in remote geographical areas (Davis, 2000), distance education is increasingly characterized as a product to be packaged and reused for efficient delivery to massive numbers of students (c.f. Noble, 2002; Wilson, Parrish, & Veletsianos, 2008). While Coursera, Udacity, and EdX allow access to educational opportunities, this argument conceals the fact that (a) the type of education offered by these initiatives appears to be reserved for students who are intrinsically motivated, self-directed, and have the necessary prior knowledge to succeed; and (b) education has goals broader than effectiveness and efficiency, namely engagement and social justice (Wilson, Parrish, & Veletsianos, 2008). In the words of Stewart (2012, ¶22), “the problem with EdX is that, scale and cost aside, it IS essentially a traditional learning model revamped for a new business era.”

Given these dichotomies, we should consider whether current implementations of open scholarship and open education (e.g., in the form of MOOCs) hold true to the ideals of democratization, equality, and justice or whether organizations might be appropriating the garb of open education without necessarily embracing the ideals of its founders.

## Assumption #2: Emphases on Digital Participation for Enhanced Outcomes

While technological advances may enable scholars efficient access to up-to-date information, networks of colleagues, and the potential to connect and network with diverse audiences, scholars need to develop an understanding of participatory cultures in order to take full advantage of open scholarship. For example, scholars need to develop an understanding of the affordances of the participatory web for scholarship and consider the implications of online identity and digital participation (c.f. Coiro, Knobel, Lankshear, & Leu, 2008).

To participate productively in scholarly networks online, scholars not only need to understand the participatory nature of the Web, they also need to develop the social and digital literacies and skills essential for effective engagement with such networks. Unequal access to technology and/or lack of digital literacies is referred to as the participation gap (c.f.

Jenkins et al., 2006). In the context of open scholarship, the participation gap may refer to those scholars and learners who participate in networked spaces and are able to take advantage of digital literacies to advance their learning, teaching, research, and career (e.g., learning new teaching approaches, bringing their research to the attention of broad audiences, organizing colleagues to tackle important professional issues) vis-à-vis those who have had no exposure to participatory cultures or who do not have the essential literacies to engage in such activities online. Rheingold (2010) is convinced that individuals need literacies affording them to decode and encode digital information. These literacies relate to attention, participation, collaboration, network awareness, and critical consumption (Rheingold). Without access to these literacies, contemporary scholars and learners will be ineffective participants in online spaces. Subscribing, following, and commenting on other scholars' blogs, for example, will at some point become too much of a time commitment. Nevertheless, scholars who are literate in digital matters are capable of devising ways to manage participation. For instance, the use of web services to alert scholars of newly published information relating to their research interests (e.g., through the use of Google Alerts) allows scholars to effortlessly remain current in developments in their field.

These issues introduce a need to redesign university curricula preparing future scholars to account for the changing nature of scholarship. In such curricula, we envision the teaching of tools to manage scholarly participation online and engagement with issues such as participatory cultures, open access publishing, information management, digital literacies, community-engaged scholarship, and scholarship evaluation metrics. In addition, we envision the development of learners' skills in situ, where their learning occurs in scholarly communities of practice, enabling scholars-in-training to understand both the content and the digital culture of open scholarship. For instance, digitally conscious scholars might employ the services of text-mining technologies (e.g., Google Alerts) to track mentions of their name or their publications such that they can take an active role in managing how they are represented online. These issues become increasingly important because, given the amount of information that exists online, including the publication of journals in digital form, the presence of university profiles, and the use of social media services for personal reasons, it is highly likely that scholars are already searchable and findable online.

### Assumption #3: Co-Evolutionary Relationship between Technology and Culture

Technological innovations present opportunities for advancing how education and knowledge are negotiated and enacted, but we must recognize that technology, and social media in particular, are not neutral. Importantly, while contemporary discourse suggests that technology can transform and disrupt current educational and knowledge-creation processes (e.g., Mazoue', 2012), such discussion is largely guided by techno-enthusiasm and techno-determinism, focusing on viewing technology as a solution for cultural, systemic, and economic problems. However, technologies have embedded values and norms that may be in conflict with the values and norms of higher education cultures, advancing tensions and compromises.

For example, social media tools currently structure relationships and power structures in

relatively flat and non-hierarchical manners (e.g., all connections are “friends,” or all connections are “followers”), and such a stance may be incompatible with how relationships are structured in educational settings and other contexts offline (Veletsianos & Kimmons, in press). At the same time, while participation in social media offers opportunities for connectedness and sharing of knowledge, we need to remain vigilant of the potential that social media might reinforce existing structures and norms. The tendency to connect with similar or like-minded individuals online as offline, what Thelwall (2009) calls homophily, means that social media may not foster diverse spaces for knowledge exchange and negotiation, leading instead to “echo chambers,” a situation in which we share knowledge and perspectives with individuals who already share the same views as ourselves. At the same time, social media may shape the information that scholars access online via algorithms that are intended to support personalization but have the side effect of blinding users to diversity and encouraging uniformity. Pariser (2011) describes this phenomenon as the “filter bubble” and presents a convincing array of examples in which Internet tools have limited users’ exposure to diverse information because web algorithms are designed to retrieve information that they deem relevant to the user (i.e., that which confirms prior behavior).

Given the fact that various technologies are negotiated spaces with embedded values, we should recognize that practices developing in conjunction with emergent technologies (e.g., Facebook, Twitter, Google) will be influenced by the embedded values of those technologies and that not all of these influences may be positive. For example, though Google Search may give scholars quick access to a wide array of open resources, the presentation of such resources might be biased to support the researcher’s opinions, thereby hiding conflicting evidence. Additionally, though Twitter might allow researchers to follow one another and discuss topics of interest, such discussions may go unchallenged if participants are only followed by those who have similar educational training and beliefs.

#### Assumption #4: Practicality and Effectiveness for Achieving Scholarly Aims

Though open scholarship may offer some clear benefits to improve scholarly efficiency and to practically address perennial problems in scholarly institutions (e.g., data sharing, research dissemination), such practices may also open the door to new dilemmas and make some aspects of current practice less efficient. For example, authors argue that the volume of information online has skyrocketed (Aro & Olkinuora, 2007) and that the information age has produced a data “deluge” (Baker, 2008) or “explosion” (Delen & Al-Hawamdeh, 2009). Though information overload is hardly a new concept (Rosenberg, 2003), due to the increasing availability of scholarly publications online, the data trails left behind by scholars when participating in social media, and the ease with which scholars can access resources from a diverse range of sources (e.g., from YouTube, to the New York Times, to this journal), scholars may come to face a personal information management challenge that entails (a) keeping up-to-date with newly published information, (b) filtering information, (c) rapidly differentiating between helpful and irrelevant information, and (d) saving helpful information for future retrieval. In other words, though open practices may make some aspects of scholarly practice more efficient (e.g., information sharing), such efficiency may

create bottlenecks for other aspects of scholarly endeavor (e.g., differentiating between important and peripheral information).

To overcome this challenge, scholars need to develop skills, devise methods, and use technologies to manage (e.g., efficiently collect, categorize, and retrieve) digital information pertinent to their work and their digital participation. RSS readers and aggregators for example are viable solutions to information management challenges. RSS readers are applications that individuals can use to subscribe to feeds (e.g., blogs). These applications monitor feeds and download new content when it becomes available. Because RSS feeds download content to a central location as it becomes available, the user no longer needs to visit sites in search of content that is of interest to him/her. Scholars can use such applications to efficiently retrieve and archive digital information relevant to their professional interests via blogs, twitter feeds, journal feeds, and other sources of continuously updated information.

However, merely developing digital literacies, effectively using technologies, and participating in online scholarly communities does not mean that scholars will necessarily become efficient or equal participants in online spaces. Social stratification and exclusion in online environments and networks is possible, especially if scholars do not understand the cultural norms of networked participation. While digital literacies and an understanding of social technologies may enable scholars to engage in open scholarship, it does not necessarily follow that participation will be without perils or inequities. Where there is freedom to share and collaborate, there is often also freedom to abuse and exploit, so we should be careful not to indulge in idealized notions of participation, sharing, and openness that may be misguided. As Chander and Sunder (2004, p. 1332) point out when discussing what they term *the romance of the public domain*,

[c]ontemporary scholarship extolling the public domain presumes a landscape where each person can reap the riches found in the commons [equally] ... [b]ut, in practice, differing circumstances - including knowledge, wealth, power, and ability - render some better able than others to exploit a commons.

Thus, in the case of open scholarship, issues surrounding the provision of MOOCs, use of open access journals, accessibility and use of OER, participation in scholarly networks, and use of social media by diverse audiences will arise and should be a matter of concern for participants when considering who profits from, and can efficiently and practically use, their collaborative or shared work. As a simple example of this issue, while we can advocate that individuals should publish in OA journals or that they should use social media in their professional practice, we must recognize that if we engage professionally with these practices ourselves, our advocacy comes from a position of power and we might be better positioned to benefit from these practices than others whose individual circumstances prevent them from fully adopting such practices.

## Conclusion

In this paper, we identified a number of assumptions of the open scholarship movement and highlighted challenges associated with the aspirations of broadening access to education and knowledge through openness. We noted that even though openness and open scholarship have generated positive outcomes for those who enact and participate in such practices, individuals in the field infrequently critique their assumptions. The assumptions we identified suggest that open scholarship

- is rooted in an ethical pursuit of democratization, human rights, equality, and justice;
- highlights the importance of digital participation;
- is treated as co-evolutionary with technological advances;
- is considered as an approach capable of achieving socially valuable scholarly aims.

Challenges facing open scholarship are associated with each one of these assumptions. Examples include the misappropriation of open scholarship; the need for scholars developing social and digital literacies; the consideration that technology is neither neutral, nor a single solution to problems facing education and scholarship; and the consideration that open scholarship introduces new dilemmas relating to power, fairness, and equity.

In the introduction of our paper, we noted that Friedman (2005) argued that digital technologies and open source initiatives have contributed to the development of an even playing field between nations, groups, and individuals. Friedman however also noted that there is no guarantee that technologies will be used for the benefit of humanity, as he argues that the disempowered live in a flat world, but “don’t have the tools or the skills or the infrastructure to participate in any meaningful or sustained way” (p. 382). Open scholarship has the potential to enhance scholarly endeavors, but it requires paradigmatic shifts in the ways that we think about education, knowledge, learning, teaching, and research. It also requires shifts in the ways that we view our identity as scholars, in the ways we think about media, and in the ways that we think about social stratification. Future research should examine these issues using both theoretical and empirical approaches, reporting on both the challenges individuals face when engaging with open scholarship, their successes and failures, as well as any breakthroughs developed to address the challenges we identified. In the process of creating scholarly and educational systems for the future, we, as an education community, need to remain critical of the systems we are creating and question our assumptions and practices. While such systems might arise from the inadequacies and shortcomings of the status quo, this does not make them exemplar or just.

## References

- Atkins, D., Seely Brown, J. & Hammond, A. (2007). *A review of the open educational resources (OER) movement: Achievements, challenges, and new opportunities* (Report to The William and Flora Hewlett Foundation). Retrieved from <http://www.hewlett.org/uploads/files/ReviewoftheOERMovement.pdf>
- Beer, D. D. (2008). Social network(ing) sites... revisiting the story so far: A response to danah boyd & Nicole Ellison. *Journal of Computer-Mediated Communication*, 13(2), 516–529.
- Binkley, R. C. (1935). New tools for men of letters. *The Yale Review*, 24, 519-537.
- Bonk, C. J. (2009). *The world is open: How Web technology is revolutionizing education*. San Francisco, CA: John Wiley and Sons.
- Boyer, E. (1990). *Scholarship reconsidered: Priorities for the professoriate*. Princeton, NJ: The Carnegie Foundation for the Advancement of Teaching.
- Brody, T., & Harnad, S. (2004). Comparing the impact of open access (OA) vs. non- OA articles in the same journals. *D-Lib Magazine*, 10(6).
- Budapest Open Access Initiative (2002). Retrieved from <http://www.soros.org/openaccess/read.shtml>
- Bull, G., Thompson, A., Searson, M., Garofalo, J., Park, J., Young, C., & Lee, J. (2008). Connecting informal and formal learning experiences in the age of participatory media. *Contemporary Issues in Technology and Teacher Education*, 8(2), 100–107.
- Burton, G. (2009). The open scholar. *Academic Evolution blog*. Retrieved from <http://www.academicrevolution.com/2009/08/the-open-scholar.html>
- Carson, S., & Schmidt, J. (May, 2012). The massive open online professor. *Academic Matters*. Retrieved from <http://www.academicmatters.ca/2012/05/the-massive-open-online-professor/>
- Caswell, T., Henson, S., Jensen, M., & Wiley, D. (2008). Open content and open educational resources: Enabling universal education. *The International Review Of Research In Open And Distance Learning*, 9(1).
- Chan, L. (2004). Supporting and enhancing scholarship in the digital sge: The role of open access institutional repository. *Canadian Journal of Communication*, 29(3). Retrieved from <http://cjc-online.ca/index.php/journal/article/view/1455>
- Chander, A., & Sunder, M. (2004). The romance of the public domain. *California Law Review*, 92(5), 1331-1373.

- Cohen, L. (2007). Social scholarship on the rise [Blog entry posted to Library 2.0: An Academic's Perspective]. Retrieved from [http://liblogs.albany.edu/library20/2007/04/social\\_scholarship\\_on\\_the\\_rise.html](http://liblogs.albany.edu/library20/2007/04/social_scholarship_on_the_rise.html)
- Coiro, J., Knobel, M., Lankshear, C., & Leu, D. (2008). Central issues in new literacies and new literacies research. In J. Coiro, M. Knobel, C. Lankshear, C., & D. Leu (Eds.), *Handbook of research on new literacies* (p. 1-21). New York: Lawrence Erlbaum.
- Couros, A. (2010). Developing personal learning networks for open and social learning. In Veletsianos G. (Ed.), *Emerging technologies in distance education* (p. 109-128). Edmonton, AB: Athabasca University Press.
- Craig, I. D., Plume, A. M., McVeigh, M. E., Pringle, J., & Amin, M. (2007). Do open access articles have greater citation impact? A critical review of the literature. *Journal of Informetrics*, 1(3), 239-248.
- Davis, L. (2000). Electronic highways, electronic classrooms: Distance education in Canada. In M. B. Castellano, L. Davis, & L. Lahache (Eds.), *Aboriginal education: Fulfilling the promise* (pp. 224-251). Vancouver, BC: UBC Press.
- Davis, P. (2006, March). Do open-access articles really have a greater research impact? *College & Research Libraries*, 67(2).
- Davis, P., & Fromerth, M. J. (2007). Does the arXiv lead to higher citations and reduced publisher downloads for mathematics articles? *Scientometrics*, 71(2), 203-215.
- European Commission (2012). *A reinforced European research area partnership for excellence and growth*. Communication from the Commission to the European parliament. Retrieved from [http://ec.europa.eu/research/science-society/document\\_library/pdf\\_06/era-communication-partnership-excellence-growth\\_en.pdf](http://ec.europa.eu/research/science-society/document_library/pdf_06/era-communication-partnership-excellence-growth_en.pdf)
- Evans, J. A. (2008). Electronic publication and the narrowing of science and scholarship. *Science*, 321(5887), 395-399.
- Evans, J. A., & Reimer, J. (2009). Open access and global participation in science. *Science*, 323(5917), 1025.
- Eysenbach, G. (2006). Citation advantage of open access articles. *PLoS Biol*, 4(5), e157.
- Fini, A. (2009). The technological dimension of a massive open online course: The case of the CCKo8 course tools. *International Review of Research in Open and Distance Learning*, 10(5).
- Friedman, T. L. (2005). *The world is flat: A brief history of the twenty-first century*. New York: Farrar, Straus, and Giroux.

- Furlough, M. (2010). Open access, education research, and discovery. *The Teachers College Record*, 112(10), 2623-2648.
- Gargouri, Y., Hajjem, C., Larivière, V., Gingras, Y., Brody, T., & Harnad, S. (2010). Self-selected or mandated, open access increases citation impact for higher quality research. *Plos one*, 5(10), e13636.
- Garnet, F., & Ecclesfield, N. (2011). Towards a framework for co-creating open scholarship. *Proceedings of the Association for Learning Technologies Conference (ALT-C)*.
- Getz, M. (2005). *Open scholarship and research universities*. Working Paper 0517, Department of Economics, Vanderbilt University. Retrieved from <http://ideas.repec.org/p/van/wpaper/0517.html>
- Geser, G. (2012). *Open educational practices and resources: OLCOS Roadmap 2012*. Salzburg, Austria: Salzburg Research, EduMedia Group. Retrieved from [http://www.olcos.org/cms/upload/docs/olcos\\_roadmap.pdf](http://www.olcos.org/cms/upload/docs/olcos_roadmap.pdf)
- Greenhow, C. (2009). Social scholarship: Applying social networking technologies to research practices. *Knowledge Quest*, 37(4), 42-47.
- Greenhow, C., & Robelia, B. (2009a). Old communication, new literacies: Social network sites as social learning resources. *Journal of Computer-Mediated Communication*, 14(4), 1130-1161.
- Greenhow, C., & Robelia, B. (2009b). Informal learning and identity formation in online social networks. *Learning, Media & Technology*, 34(2), 119-140.
- Greenhow, C., Robelia, B., & Hughes, J. (2009). Learning, teaching, and scholarship in a digital age: Web 2.0 and classroom research: What path should we take now? *Educational Researcher*, 38(4), 233-245.
- Hajjem, C., Harnad, S., & Gingras, Y. (2005). Ten-year cross-disciplinary comparison of the growth of open access and how it increases research citation impact. *IEEE Data Engineering Bulletin*, 28(4), 39-47.
- Hall, R. (2011). Triple crunch and the politics of educational technology. *DMU Learning Exchanges blog*. Retrieved from <http://www.learnex.dmu.ac.uk/2011/06/08/triple-crunch-and-the-politics-of-educational-technology/>
- Heap, T., & Minocha, S. (2012). An empirically grounded framework to guide blogging for digital scholarship. *Research In Learning Technology*, 20. doi:10.3402/rlt.v20i0.19195
- Henneken, E., Kurtz, M., Eichhorn, G., Accomazzi, A., Grant, C., Thomson, D., & Murray, S. (2006). Effect of e-printing on citation rates in astronomy and physics. *Journal*

of *Electronic Publishing*, 9(2).

- Hilton, J., & Wiley, D. (2010). Free: Why authors are giving books away on the Internet. *TechTrends*, 54(2), 43–49.
- Houghton, J., & Sheehan, P. (2006). *The economic impact of enhanced access to research findings*. Centre for Strategic Economic Studies Working paper, Victoria University, Melbourne. Retrieved from <http://www.cfses.com/documents/wp23.pdf>
- Hoosen, S., (2012). *Survey on governments' open educational resources (OER) policies* (Report for UNESCO and the Commonwealth of Learning). Retrieved from [http://www.col.org/PublicationDocuments/Survey\\_On\\_Government\\_OER\\_Policies.pdf](http://www.col.org/PublicationDocuments/Survey_On_Government_OER_Policies.pdf)
- Ipsos. (2011, July 14). *Canada's love affair with online social networking continues*. Retrieved from <http://www.ipsos-na.com/news-polls/pressrelease.aspx?id=5286>
- Jenkins, H., Clinton K., Purushotma, R., Robinson, A.J., & Weigel, M. (2006). *Confronting the challenges of participatory culture: Media education for the 21st century*. Chicago, IL: The MacArthur Foundation.
- Kirkup, G. (2010). Academic blogging: Academic practice and academic identity. *London Review of Education*, 8(1), 75–84.
- Kjellberg, S. (2010). I am a blogging researcher: Motivations for blogging in a scholarly context. *First Monday*, 15(8). Retrieved from <http://www.uic.edu/htbin/cgiwrap/bin/ojs/index.php/fm/article/view/2962/2580>
- Kop, R., & Fournier, H. (2010). New dimensions to self-directed learning in an open networked learning environment. *International Journal of Self-Directed Learning*, 7(2), 2-20.
- Kuchma, I. (2008). Open access, equity, and strong economy in developing and transition countries: Policy perspective. *Serials Review*, 34(1), 13–20.
- Kumashiro, K., Pinar, W., Graue, E., Grant, C., Benham, M., Heck, R., Scheurich, J., Luke, A., & Luke, C. (2005). Thinking collaboratively about the peer-review process for journal-article publication. *Harvard Educational Review*, 75(3), 257-285.
- Kurtz, M., & Brody, T. (2006). The impact loss to authors and research. In N. Jacobs (Ed.), *Open access: Key strategic, technical and economic aspects*. Oxford: Chandos Publishing.
- Laakso, M., Welling, P., Bukvova, H., Nyman, L., Björk, B.-C., & Hedlund, T. (2011). The development of open access journal publishing from 1993 to 2009. *PLoS ONE*, 6(6), e20961.

- Lawrence, S. (2001). Free online availability substantially increases a paper's impact. *Nature Web debates*. Retrieved from <http://www.nature.com/nature/debates/e-access/Articles/lawrence.html>
- Lewin, R. (July, 2012). Universities reshaping education on the Web. *The New York Times* [electronic edition]. Retrieved from <https://www.nytimes.com/2012/07/17/education/consortium-of-colleges-takes-online-education-to-new-level.html>
- Lewis, S. P. (2006). Open access articles have a greater research impact than articles not freely available. *Evidence Based Library and Information Practice*, 1(3), 57-59.
- Lynch, C. A. (2003). Institutional repositories: Essential infrastructure for scholarship in the digital age. *Portal: Libraries and the Academy*, 3(2), 327-336.
- Martindale, T., & Wiley, D. A. (2005). Using weblogs in scholarship and teaching. *TechTrends*, 49(2), 55-61.
- Mazer, J., Murphy, R., & Simonds, C. (2007). I'll see you on "Facebook": The effects of computer-mediated teacher self-disclosure on student motivation, affective learning, and classroom. *Communication Education*, 56(1), 1-17.
- Mazer, J., Murphy, R., & Simonds, C. (2009). The effects of teacher self-disclosure via Facebook on teacher credibility. *Learning, Media and Technology*, 34(2), 175-183.
- Mazoue', J. (in press). The deconstructed campus. *Journal of Computing in Higher Education*.
- McAuley, A., Stewart, B., Siemens, G., & Cormier, D. (2010). *The MOOC model for digital practice* (University of Prince Edward Island, Social Sciences and Humanities Research Council's Knowledge synthesis grants on the Digital Economy report). Retrieved from [http://www.elearnspace.org/Articles/MOOC\\_Final.pdf](http://www.elearnspace.org/Articles/MOOC_Final.pdf).
- McKenna, L. (May, 2012). The big idea that can revolutionize higher education: 'MOOC.' *The Atlantic* [electronic edition]. Retrieved from <http://www.theatlantic.com/business/archive/2012/05/the-big-idea-that-can-revolutionize-higher-education-mooc/256926/>
- Mishra, P., Koehler, M. J., & Kereluik, K. (2009). The song remains the same: Looking back to the future of educational technology. *TechTrends*, 53(5), 48-53.
- Moed, H. F. (2006). The effect of "Open Access" upon citation impact: An analysis of ArXiv's condensed matter section. *Journal of the American Society for Information Science and Technology*, 58(13), 2145-2156.
- Moran M., Seaman J. & Tinti-Kane H. (2011). *Teaching, learning, and sharing: How today's higher education faculty use social media for work and for play*. Pearson

Learning Solutions.

- Munoz, C., & Towner, T. (2009). Opening Facebook: How to use Facebook in the college classroom. *Proceedings of Society for Information Technology & Teacher Education International Conference* (pp. 2623–2627).
- Nardi, B. A., Schiano, D. J., & Gumbrecht, M. (2004). Blogging as social activity, or, would you let 900 million people read your diary? *Proceedings of the 2004 ACM conference on Computer supported cooperative work* (pp. 222–231).
- Neylon, C., & Wu, S. (2009). Article-level metrics and the evolution of scientific impact. *PLoS Biology*, 7(11), e1000242.
- Noble, D. (2002). *Digital diploma mills: The automation of higher education*. New York, NY: Monthly Review Press.
- Norris, M., Oppenheim, C., & Rowland, F. (2008). The citation advantage of open-access articles. *Journal of the American Society for Information Science and Technology*, 59(12), 1963-1972.
- OECD (2007). *Giving knowledge for free: The emergence of open educational resources*. Retrieved from <http://www.oecd.org/edu/cei/38654317.pdf>
- Pariser, E. (2011). *The filter bubble: What the Internet is hiding from you*. London: Viking/Penguin Press.
- Pearce, N., Weller, M., Scanlon, E., & Kinsley, S. (2010). Digital scholarship considered: How new technologies could transform academic work in education. *In Education*, 16(1).
- Rheingold, H. (2010). Attention, and other 21st-century social media literacies. *EDUCAUSE Review*, 45(5), 14-24.
- Roblyer, M., McDaniel, M., Webb, M., Herman, J., & Witty, J. V. (2010). Findings on Facebook in higher education: A comparison of college faculty and student uses and perceptions of social networking sites. *The Internet and Higher Education*, 13(3), 134-140.
- Rodriguez, O. (2012). MOOCs and the AI-Stanford like courses: Two successful and distinct course formats for massive open online courses. *European Journal of Open and Distance Learning*, 15. Retrieved from <http://www.eurodl.org/index.php?p=current&article=516>
- Rosenberg, D. (2003). Early modern information overload. *Journal of the History of Ideas* 64(1), 1-9.

- Selwyn, N. (2011a). Social media in higher education. In Gladman, A., (Ed.), *The Europa world of learning* (pp. 1-9). London, UK: Routledge.
- Selwyn, N. (2011b). Editorial: In praise of pessimism—the need for negativity in educational technology. *British Journal of Educational Technology*, 42(5), 713-718.
- Stewart, B. (May, 2012). The problem with EdX. *Inside Higher Ed*. Retrieved from <http://www.insidehighered.com/blogs/university-venus/problem-edx>
- Trinidad, S. B., Fullerton, S. M., Bares, J. M., Jarvik, G. P., Larson, E. B., & Burke, W. (2010). Genomic research and wide data sharing: Views of prospective participants. *Genetics in Medicine*, 12(8), 486-495.
- Tufekci, Z. (2008). Grooming, gossip, Facebook, and MySpace. *Information, Communication & Society*, 11(4), 544-564.
- UNESCO (2002). *Forum on the impact of open courseware for higher education in developing countries: Final report*. Retrieved from <http://unesdoc.unesco.org/images/0012/001285/128515e.pdf>
- Veletsianos, G. (2010). A definition of emerging technologies for education. In G. Veletsianos (Ed.), *Emerging technologies in distance education* (pp. 3-22). Edmonton, AB: Athabasca University Press.
- Veletsianos, G. (2012). Higher education scholars' participation and practices on Twitter. *Journal of Computer Assisted Learning*, 28(4), 336-349.
- Veletsianos, G., & Kimmons, R. (in press). *Scholars and faculty members lived experiences in online social networks*. The Internet and Higher Education.
- Veletsianos, G., & Kimmons, R. (2012). Networked participatory scholarship: Emergent techno-cultural pressures toward open and digital scholarship in online networks. *Computers & Education*, 58(2), 766-774.
- Veletsianos, G., & Navarrete, C. (2012). Online social networks as formal learning environments: Learner experiences and activities. *The International Review Of Research In Open And Distance Learning*, 13(1), 144-166.
- Walker, J. (2006). Blogging from inside the ivory tower. In A. Bruns & J. Jacobs (Eds.), *Uses of blogs*. New York, NY: Peter Lang.
- Weller, M. (2011). *The digital scholar: How technology is transforming scholarly practice*. London, UK: Bloomsbury Academic.
- Wiley, D. (2003). A modest history of OpenCourseWare. *Autounfocus blog*. Retrieved from <http://www.reusability.org/blogs/david/archives/000044.html>
- Wiley, D. (2006). Open source, openness, and higher education. *Innovate* 3(1). Retrieved

from <http://www.innovateonline.info/index.php?view=article&id=354>

- Wiley, D. (2010). Open education. In M. K. Barbour & M. Orey (Eds.), *The foundations of instructional technology*. Retrieved from [http://projects.coe.uga.edu/ITFoundations/index.php?title=Open\\_Education](http://projects.coe.uga.edu/ITFoundations/index.php?title=Open_Education)
- Wiley, D., & Hilton III, J. (2009). Openness, dynamic specialization, and the disaggregated future of higher education. *The International Review Of Research In Open And Distance Learning*, 10(5). Retrieved from <http://www.irrodl.org/index.php/irrodl/article/view/768>
- Wiley, D., Hilton III, J., Ellington, S., & Hall, T. (2012). A preliminary examination of the cost savings and learning impacts of using open textbooks in middle and high school science classes. *The International Review Of Research In Open And Distance Learning*, 13(3), 262-276.
- Wiley, D., & Green, C. (2012). Why openness in education? In D. Oblinger (Ed.), *Game changers: Education and information technologies* (pp. 81-89). Educause.
- Wilson, B., Parrish, P., & Veletsianos, G. (2008). Raising the bar for instructional outcomes: Towards transformative learning experiences. *Educational Technology*, 48(3), 39-44.
- Zaugg, B. H., West, R. E., Tateishi, I., & Randall, D. L. (2011). Mendeley: Creating communities of scholarly inquiry through research collaboration. *TechTrends*, 55(1), 32-36.

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## Beyond the Net Generation Debate: A Comparison of Digital Learners in Face-to-Face and Virtual Universities



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### Abstract

In the last decade, an important debate has arisen about the characteristics of today's students due to their intensive experience as users of ICT. The main belief is that frequent use of technologies in everyday life implies that competent users are able to transfer their digital skills to learning activities. However, empirical studies developed in different countries reveal similar results suggesting that the "digital native" label does not provide evidence of a better use of technology to support learning. The debate has to go beyond the characteristics of the new generation and focus on the implications of being a learner in a digitalised world. This paper is based on the hypothesis that the use of technology to support learning is not related to whether a student belongs to the Net Generation, but that it is mainly influenced by the teaching model.

The study compares behaviour and preferences towards ICT use in two groups of university students: face-to-face students and online students. A questionnaire was applied to a sample of students from five universities with different characteristics (one offers online education and four offer face-to-face education with LMS teaching support).

Findings suggest that although access to and use of ICT is widespread, the influence of teaching methodology is very decisive. For academic purposes, students seem to respond to the requirements of their courses, programmes, and universities. There is a clear relationship between students' perception of usefulness regarding certain ICT resources and their teachers' suggested uses of technologies. The most highly rated technologies correspond with those proposed by teachers. The study shows that the educational model (face-to-face or online) has a stronger influence on students' perception of usefulness regarding ICT support for learning than the fact of being a digital native.

**Keywords:** Net Generation, digital learner, students' characteristics, online learning, higher education

## Introduction

*Net Generation* (Tapscott, 1998), *digital natives* (Prensky, 2001), and *Millennial Learners* (Oblinger & Oblinger, 2005) are three of the most popular terms that have been used to refer to current students, born after 1982. Each author describes this new generation using a different term, but all of them share similar features. Their main hypothesis is that immersion in a technological context influences the skills and interests of the new generation in a considerable way. The most common characteristics attributed to members of this generation are that they make extensive use of technology for communication purposes and that this intensive use makes them experts in technology (Oblinger & Oblinger, 2005; Prensky, 2001; Tapscott, 1998).

These ideas have become very controversial since the main part of the debate has not been informed empirically. Moreover, Bayne and Ross (2007) consider that there is a paradox at the centre of this debate because each person is fixed by his or her generational position—you either are or you are not a “native.” This fact has important consequences because it introduces a difficult perspective in terms of professional development. Older teachers and academic staff will never be able to bridge the gap arising from their generational position (Bayne & Ross, 2007).

Most of the empirical evidence demonstrates that the situation is not so simple and that it is not obvious that such a digital generation actually exists in a homogenous way. There may be age-related differences concerning perceptions and experiences of technology-mediated learning, but there may also be other demographic characteristics, such as gender (Selwyn, 2008) and academic discipline (Kennedy, Judd, Churchward, Gray, & Krause, 2008).

Empirical studies about the digital generation approach are mainly focused on the analysis of access to technology, the different types of use, and the transfer of technological skills to learning. Beyond these approaches, the initial hypothesis of this research is that the use of technology to support learning is not related to whether a student belongs to the Net Generation. It depends, rather, on the pedagogical and teaching models of the institution. Our study focuses on the analysis of ICT uses in academic contexts, comparing students at an online university versus students at traditional universities.

## Technology Access and Uses

Kennedy et al. (2008) found that there was significant diversity among first-year Australian students' use of technologies. Access, use, and preference varied considerably among students and degree programmes. The results of this research call into question the assumptions that underpin the idea of digital natives and the Net Generation. In the UK, Margaryan and Littlejohn (2008) found that students used a limited range of established technologies for learning, personal, and social use. They found that the youngest students were not used to advanced technologies and services, such as virtual worlds and personal web publishing. Furthermore, there was no evidence to support the idea that students were adopting radically different study patterns. Selwyn (2008) considered that we could not talk about a homogenous new generation of learners on the basis of a survey of UK students. There are important variations across age, gender, and socioeconomic status. Caruso and Kvavik (2005) found that students were comfortable with a core set of technologies but that they were less comfortable with specialised technologies.

## Transfer

The main argument supporting the Net Generation discourse is that through frequent use of technologies, students become competent users, which makes them capable of transferring their digital skills to learning with the support of technology. However, most studies suggest that although today's students come to university with some digital skills, the use of digital media for studying might be quite different and the transfer of these skills is not automatic (Bullen, Morgan, & Qayyum, 2011; Romero, Guitert, Bullen, & Morgan, 2011; Kennedy et al., 2008; Kirkwood & Price, 2005). Moreover, some characteristics, such as these students' ability to simultaneously process multiple channels of information, can have negative effects. For example, assuming that Facebook is something that students use concurrently with studying or other activities, Kirschner and Karpinski (2010) found a significant negative relationship between the use of Facebook and academic performance.

Kirkwood and Price (2005) argue that few students have high levels of competence across a wide range of applications and that familiarity with the use of email does not imply expertise in rigorous online debate and discussion (Kirkwood & Price, 2005: 271). Margaryan and Littlejohn (2008) state that

for learning, mainly established ICTs are institutional VLEs [Virtual Learning Environment], Google and Wikipedia, and mobile phones... [The] findings point to a low level of use of and familiarity with collaborative knowledge creation tools, virtual worlds, personal web publishing, and other emergent social technologies. (p. 1)

Helsper and Eynon (2009) analysed the different aspects of what a digital native is by exploring whether it is determined by age, experience, or breadth of use. The conclusion was that the degree of digital expertise is related to confidence in the use of technologies, the use of the Internet as a first port of call for information, and the use of the Internet for learning, as well as other activities (Helsper & Eynon, 2009, p. 9).

The main findings suggest that communication and social activities are supported by the use of technology in daily life, while there are significant differences in the use of technology for learning. Along this line, Kennedy et al. (2008) have established an interesting distinction between “living” and “learning” technologies. Living technologies are those that people choose to use in their everyday life, mainly for social and leisure purposes. On the other hand, learning technologies are those that students use for intellectual or study purposes.

To summarise, young people have extensive access to technology, but the use of technology to support learning is very heterogeneous. There are some who engage in a wide range of technology-based activities, including content creation and self-publishing, while others never participate in those activities.

Taking into account that the use of technology to support learning in higher education is becoming more and more relevant, the debate must go beyond the characteristics of the new generation and focus on what it means to be a learner in a digital environment.

According to Dabbagh (2007), online learners must be ready to share their work, interact within small and large groups in virtual settings, and collaborate on projects online.

Studies have found that not all students report the same quality of conceptions of learning (Prosser & Trigwell, 1999; Ramsden, 2002) and that this has a strong influence on student behaviour. In this direction, Jones, Ramanau, Cross, and Healing (2010) demonstrate that students are active users of technology but that they seem to respond to the requirements of their local course, programme, and university contexts.

## Aims and Methodology

This article aims to clarify issues relating to the types of activities that technologies support in everyday and academic life for younger and older students. In this study, most of the younger students attend face-to-face universities, while the older learners attend an online university. The initial hypothesis is that the use of technology to support learning is not related to whether a student belongs to the Net Generation. It depends, rather, on the type of actions and tasks being carried out and is also influenced by the teaching model of the institution at which the learners are studying (online or face-to-face).

The main research questions of the study are as follows:

1. What are the differences between the use of “living” technologies and “learning” technologies by younger and older students?
2. What kinds of activities are supported by those technologies in everyday life and in academic life among younger and older students?
3. In which way does the university model affect learners in terms of ICT use and preferences?

To respond to these questions, we have analysed the results obtained from a questionnaire

applied to a sample of students from five universities with different characteristics (one offers online education and four offer face-to-face education with LMS teaching-support)<sup>1</sup>. The participating students were selected using a set of criteria that would allow different profiles to be built. Thus, in this research, the independent variables considered are age, gender, education, employment activity, ICT equipment available, university institution of origin (educational model, virtual or face-to-face), course, and area of knowledge.

The dependent variables considered are as follows:

1. academic use of ICT (teacher-led): type, frequency of use, and perception of usefulness
2. academic use of ICT (decided by the students): type, frequency of use, and perception of usefulness
3. perception and evaluation of the use of ICT

The analysed population is the total number of students enrolled in their first or fourth year of study during the 2010–2011 academic year at Catalan universities. The final sample of participating students was a total of 1,042 people (error 5%, confidence interval 95.5%), and the selection was random.

The questionnaire is divided into two parts: the first part was developed with reference to a prior survey conducted by Kennedy, Judd, Churchward, Gray, and Krause (2008). The second part, based on a Likert-type scale, aims to analyse the students' perceptions of the use of ICT for learning.

To obtain a deeper analysis of the students' views, we conducted three focus groups. The main goal was to have a qualitative approach to the perception of the use of technology to support learning. A total of 17 students participated in the discussion. In each group, there were students from both the face-to-face and the online universities, and the ages varied: 11 students were between 19 and 25 years old, and 6 students were more than 26 years old.

In the following section, we present the results obtained from different types of analysis and from the focus groups. Firstly, we detail the main characteristics of the sample of students participating in the study. Secondly, we provide some general results regarding the use of technologies at the university, distinguishing between those suggested by teachers and those freely chosen by the students to help them carry out their academic work. Thirdly, using a segmentation analysis, we present the most characteristic and differentiating features of the two groups of students (face-to-face and online). Finally, we present an analysis focused on the students' attitudes and perceptions of the use of ICT in the university.

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1 The online university is the Open University of Catalonia and the traditional/face-to-face universities are the University of Barcelona, the Polytechnic University of Catalonia, the Rovira and Virgili University, and the University of Lleida.

## Results

### Sample Characteristics

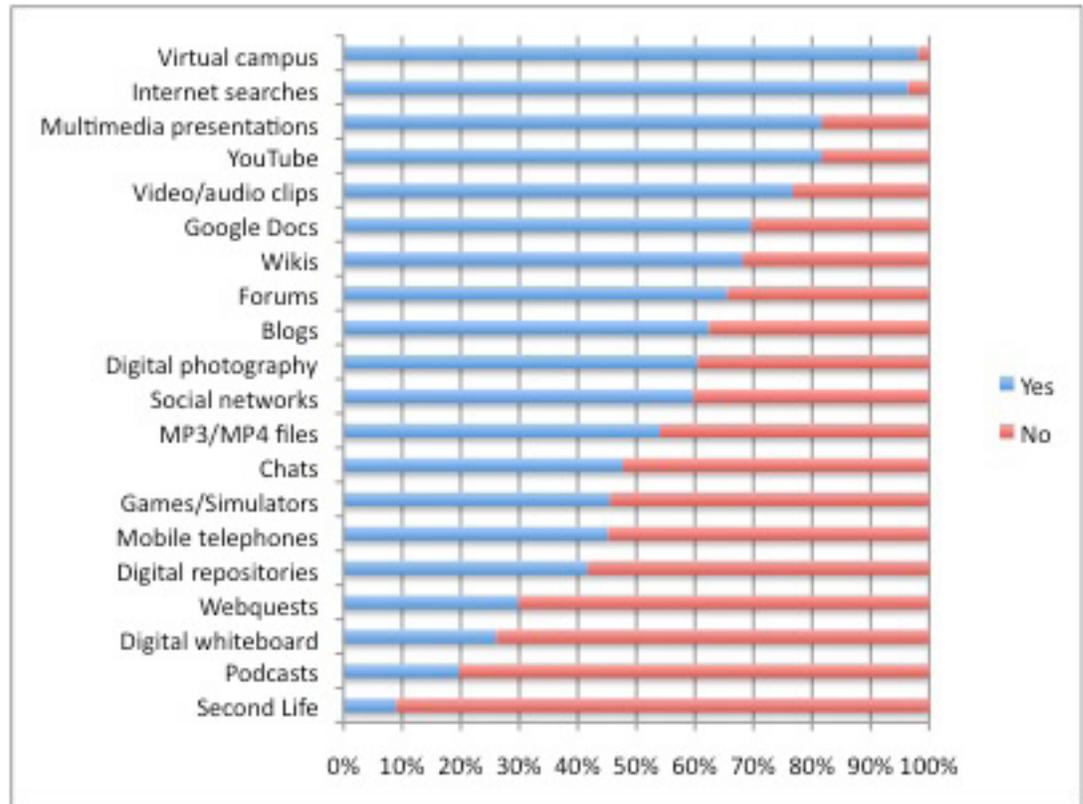
Of the total 1,042 participants in the study, 36.9% are male and 63.1% are female. The knowledge areas in which they are carrying out their studies are social sciences (43.9%), technical (25.6%), humanities (25.7%), and natural sciences (4.8%). Of the total number of participants, 74% are in their first two years of study and 26% are between their third and fifth years. Almost half of them (45%) also work.

In general, the level of access to technologies is high. The majority of the students typically connect to the Internet in their usual place of residence (77.7%), followed by the family home (47.3%), the workplace (36.9%), and the university (30.9%). The frequency of connection to the Internet is more than once a day in 82.9% of cases, and 13.5% connect just once a day. Only 3.6% connect to the Internet less frequently.

### Students' ICT Uses in Academic Activities

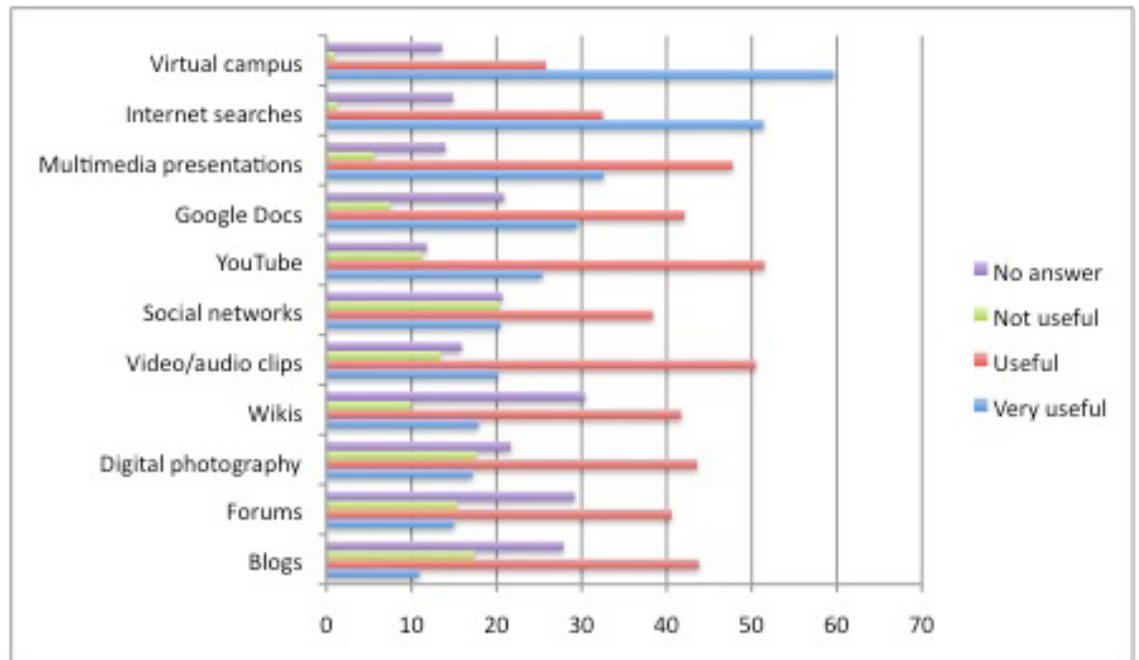
In the questionnaire, students were asked about how they use ICT to carry out their academic work at the university. The questions distinguished between uses suggested by teachers as part of learning activities and those made on the students' own initiative.

If we look at the results shown in Charts 1 and 2, we can see that the uses perceived as most and least useful correspond fairly closely to those most and least often suggested by teachers. There is concordance between the students' perception of usefulness with regard to certain ICT resources and the teachers' suggested uses of technologies. Thus, we find that the most highly rated technologies (virtual campus [LMS], Internet searches, multimedia presentations, Google Docs, and YouTube) are also the most commonly recommended by teachers for carrying out academic work: virtual campus (98.2%), Internet searches (96.5%), multimedia presentations (81.7%), YouTube (81.7%), video/audio clips (76.7%), Google Docs (69.7%), wikis (68.1%), forums (65.6%), blogs (62.5%), digital photography (60.6%), and social networks (59.8%).



*Chart 1.* Teacher-led uses of ICT in academic tasks.

It is possible that the students are applying practical criteria when making their evaluation. Therefore, they consider that the most useful technologies are those that help them to better or more easily carry out the tasks set by teachers, and consider less useful, in contrast, those that do not adapt well to teachers' proposals. It remains to be determined whether the former are also the technologies that interest them most, motivate them, or genuinely help them to learn.



*Chart 2.* Uses perceived as most useful for carrying out academic tasks.

With regard to autonomous uses, the technologies and applications that the students use most frequently when carrying out academic tasks (Chart 3) continue to be the same and in very similar proportions: Internet searches (95.8%) and virtual campus (91.2%). In second position (with a frequency of between 60% and 50%), they mention YouTube, wikis, online documents (Google Docs), and multimedia presentations, almost all of them social networking tools. Between 45% and 30% mention social networks, blogs, audio and video clips, forums, and digital photography. Finally, the resources least used in a spontaneous fashion (by less than 10% of the students) are Second Life, podcasts, webquests, digital whiteboards, games and simulators, and information repositories. In general, these are resources that are either more difficult for the students to access (as could be the case with Second Life or digital whiteboards) or that could require or be more directly associated with a specific teacher proposal guiding their use (webquests, games and simulators, etc.). In any case, we observe that podcasts and information repositories, which could in fact correspond to a more independent use by students, do not seem to meet their autonomous working needs, probably because their need to access information is covered by open searches on the Internet or by the documentation provided by teachers through the virtual campus.

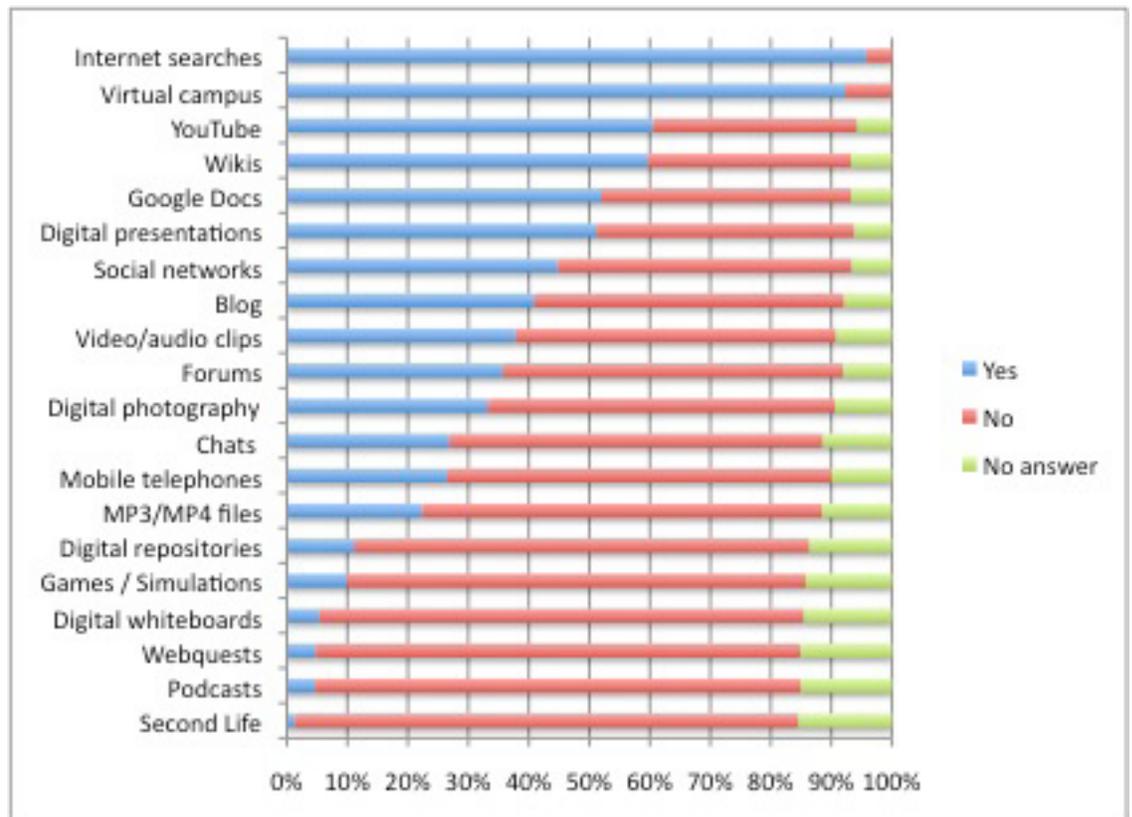


Chart 3. Autonomous uses of ICT in academic tasks.

In the focus groups, students described similar uses of ICT. Virtual campuses are mainly used to access provided readings, presentations, and general resources associated with the content of the course. There is not much interaction on the virtual campus in face-to-face universities. Technology instead tends to support traditional teaching methods:

Teachers are using PowerPoint as the main tool—PowerPoint slides. You have to enter Moodle, download them, print them, and go to class with the slides, that's all. (student)

Some teachers read the PowerPoint slides and write long sentences. Too often the text is very long and no one reads it. I think they should prepare more visual lectures because people connect better with images, rather than with words that you cannot read. (student)

You have PowerPoint presentations in Moodle. For many students, this is the main content to study to the exam. Also, students are memorising things, and not seeking the information needed to go further on that subject. No, PowerPoint cannot be the most important tool. It can not be the only tool available.(student)

Some students complain that teachers assume they already have digital skills and therefore

do not provide any specific support. This is different in the case of students in the online university because they have a compulsory course on digital skills during their first semester of studies.

In the university, people think that we know about ICT. They believe that we can use any kind of tool, but nobody teaches you. You have a digital blackboard and teachers don't know how to use it. This is incredible! I am lucky because I have worked for companies that used technology. In a company, you receive training because they know that you won't be efficient without these skills. But you come here and it is considered knowledge that you should already have, so no one teaches you. Maybe you are using resources very badly and inefficiently.  
(student)

Students are very critical about the way faculty use technology. In the discussion, we asked if they consider that social tools such as Facebook could be used to support formal activities. The answer was categorical: All students feel that they do not want to use Facebook for academic purposes; they want to establish a clear barrier between everyday life and learning.

Facebook, no, no... I will never accept a teacher on my Facebook. (student)

Facebook, no. She is my teacher, not my friend. (student)

## Emerging Differences between Face-to-Face and Online Universities

Using a segmentation analysis, we present the most characteristic and differentiating features of the two groups of students studied, taking both the independent and dependent variables identified into account. Treating the information in this way allows us to detect the most characteristic of each group. We should highlight that what appears most associated with one group are not the characteristics presented by all of the components, nor are they the only ones. Instead, they are the characteristics that emerge as differentiating features of one group compared with the other in a statistically significant way (in this case,  $p < .001$ ).

The informal use of ICT (i.e., use not connected to students' academic work) identified by each group is different (Table 1). The students at the virtual university use technologies for mainly informative and educational purposes, while among the students in face-to-face universities, the predominant use of technologies is for leisure and communication.

Table 1

*Informal Daily Use of ICT on Own Initiative*

Face-to-face mode	Online mode
Use Internet to chat	Use Internet to send and receive email
Use Internet to participate in a social network	Use Internet to access the virtual campus
Use Internet to download software/films	Use Internet to search for information for academic purposes
Use Internet to listen to music	Use Internet to search for general information
Use Internet to stay in contact with friends	Use Internet to access communication media
Use Internet to make friends	Use Internet to read content/ syndicated news
Use Internet to share MP3 files	Use Internet to translate texts
Use a mobile telephone to listen to MP3 files	
Use a mobile telephone to take photographs or videos	
Use a mobile telephone to play games	
Use a mobile telephone to make video calls	
Use a computer to listen to music	
Use a computer to play games	

With regard to the autonomous (i.e., not teacher-led) use of ICT that the students at one or other type of university exercise in their academic activities (Table 2), what stands out among the online students is fewer uses, which are more confined to the tools found in a virtual campus, while among the students in face-to-face universities, we see greater diversity in the use of technologies. This may be due to the diversity among the approaches used by the four face-to-face universities.

Table 2

*Uses of ICT in Academic Tasks*

Face-to-face mode	Online mode
Social networks	Forums
Information repositories	Blogs
Mobile telephone	
YouTube	
Online documents (Google Docs)	

The perception of competence in the different uses of ICT is also different and coherent with the previously described uses (Table 3). Among the students in the virtual environment, we can see greater perceived competence in the use of most technologies, while among the students in face-to-face environments, there is a perception of having an average level of competence. Moreover, very different uses of technologies appear once again between both groups.

Table 3

*Competence in the Informal Use of ICT*

Face-to-face mode	Online mode
<p>Average level of competence in using the Internet to</p> <ul style="list-style-type: none"> <li>• translate texts</li> <li>• send SMS</li> <li>• publish photographs</li> <li>• create a social network</li> <li>• participate in a social network</li> <li>• download software</li> <li>• read content</li> <li>• read blogs</li> <li>• share MP3/MP4 files</li> <li>• share photographs</li> <li>• chat</li> <li>• listen to music</li> <li>• buy and sell</li> <li>• make videoconference calls</li> <li>• make telephone calls</li> <li>• make friends</li> </ul>	<p>High level of competence in using the Internet to</p> <ul style="list-style-type: none"> <li>• access the virtual campus</li> <li>• send and receive emails</li> <li>• search for information</li> <li>• access communication media</li> <li>• translate texts</li> <li>• buy and sell</li> <li>• read content</li> <li>• make telephone calls</li> <li>• make videoconference calls</li> </ul>
<p>Average level of competence in using a mobile telephone to</p> <ul style="list-style-type: none"> <li>• listen to music</li> <li>• make telephone calls</li> <li>• take photographs</li> <li>• send SMS</li> <li>• play games</li> <li>• organise</li> <li>• make videos</li> </ul>	<p>High level of competence in using a mobile telephone to</p> <ul style="list-style-type: none"> <li>• take photographs</li> <li>• send photographs</li> <li>• make telephone calls</li> <li>• read blogs</li> <li>• send SMS</li> <li>• organise</li> <li>• listen to music</li> </ul>
<p>Average level of competence in using a computer to</p> <ul style="list-style-type: none"> <li>• play games online</li> <li>• create digital images</li> </ul>	<p>High level of competence in using social bookmarking</p>
<p>Average level of competence in using a PDA as a personal organiser</p>	<p>High level of competence in using a PDA as a personal organiser</p>

Finally, with regard to students' use of ICT at their teachers' suggestion (Table 4), we see that the online students make more frequent use of a greater number of technologies, with a more clearly educational use and one associated with Web 2.0 than in the case of students in face-to-face environments.

Table 4

*Formal Use of ICT at Teachers' Suggestion*

Face-to-face mode	Online mode
Frequently –virtual campus	Always –virtual campus
Always –mobile telephone	Always –repositories
Always –social networks	Always –forums
Always –MP3/MP4 files	Always –Google Docs
Always –YouTube	Always –Internet searches
	Always –wikis
	Always –blogs

Almost all the students participating in the focus groups use social networks to support their tasks and their study. They create their own groups independent of the “official” communication spaces in the virtual campus. Facebook seems to be the most popular.

We have created a group on Facebook. We have the official group in the [virtual] campus, but we use Facebook to work, to create open discussions and debates, etc.

I feel freer working in my Facebook group. Because I have comments to make, it helps to remind the calendar... We say, “Hey, this is for tomorrow!” It is not the official tool for the University.

I like WhatsApp because everyone has it, and you can talk quickly, and don't have to use the laptop. It is very useful to ask for information, you have many options for communication.

### Students' Perception of ICT Uses

Finally, we present the results obtained regarding the students' perception of the use of technologies. To create the scale, we identified a set of indicators for each of the dimensions based on the domains of the didactic triangle: content, teaching, and social. However, instead of the traditional idea of content, we have identified indicators related not only to the content but also to the skills, similar to the cognitive dimension used in the CoI model (Garrison, Anderson, & Archer, 2000). It is important to take into account that the items correspond to learning and teaching processes supported by technology in a broad sense,

that is to say, either in virtual or blended environments, with different methodological approaches, and both led by teachers and decided by students. To analyse the reliability of the scale, Cronbach's alpha coefficient was applied, and the result was 0.944, which shows high reliability.

For uses included in the cognitive dimension, the level of agreement is higher among students at the online university in all cases except one ("ICT help me to do my academic homework better"). The perception of the usefulness of ICT from the cognitive perspective is therefore more positive among the online university students. This is detected in both those items that point to greater efficiency in obtaining learning results ("ICT help me to do my academic homework faster"; "I use ICT when I want to know more about a topic") and in those items more closely related to self-regulation and the perception of learning throughout the process ("ICT help me to follow the course"; "ICT facilitate my self-assessment processes").

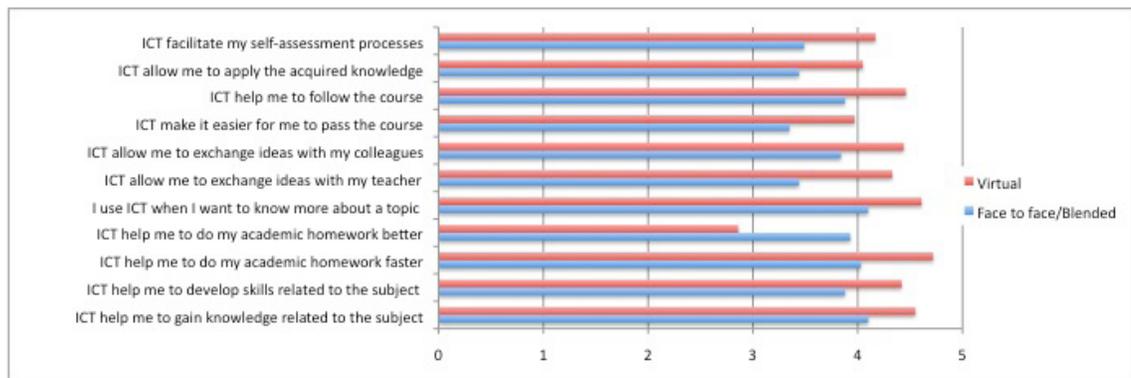


Chart 4. Cognitive dimension.

Chart 5 shows the results for the items related to the teaching dimension. The statements refer to the role of ICT in supporting the presentation of content, following the proposed methodology, and in detecting and resolving learning mistakes, whether through teaching use or not. In this case, the previous situation is repeated, thus the mean scores for use of technology by the students at the online university are higher in all cases. Of particular note, due to the high level of agreement between both groups, are those statements that refer to the presentation of content, the integration of knowledge from different sources, and the resolution of doubts by teachers.

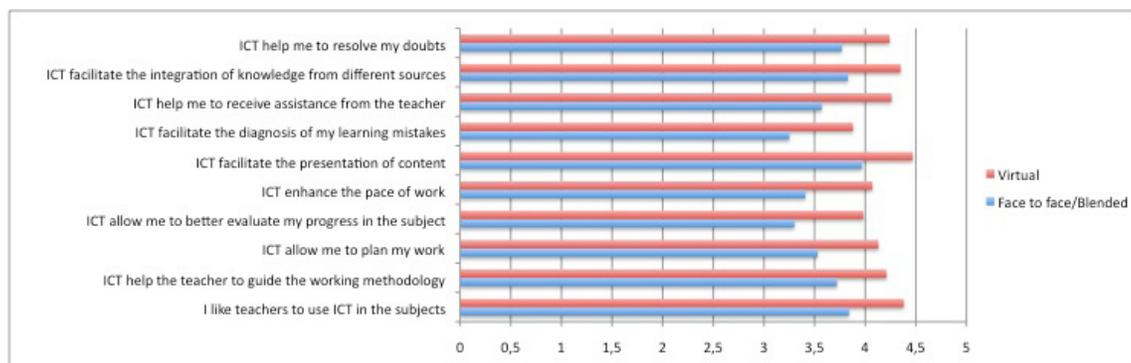


Chart 5. Teaching dimension.

Finally (in Chart 6), we can see that the same situation is repeated again in relation to social presence. In this case, the statements refer to the use of technology for communicative purposes and to express the students' personality or emotions, and also the influence of technology on generating a positive atmosphere in the courses. We can see that the students at the online university expressed a higher level of agreement than the other group, in an even more pronounced way than in the previous dimensions. This is particularly noticeable in the statements that focus directly on communicative aspects ("ICT allow me to better communicate with my teacher"; "ICT help me to ask others questions") and on relationships and public projection of the students' work ("ICT allow me to publicly show what I do for the subjects").

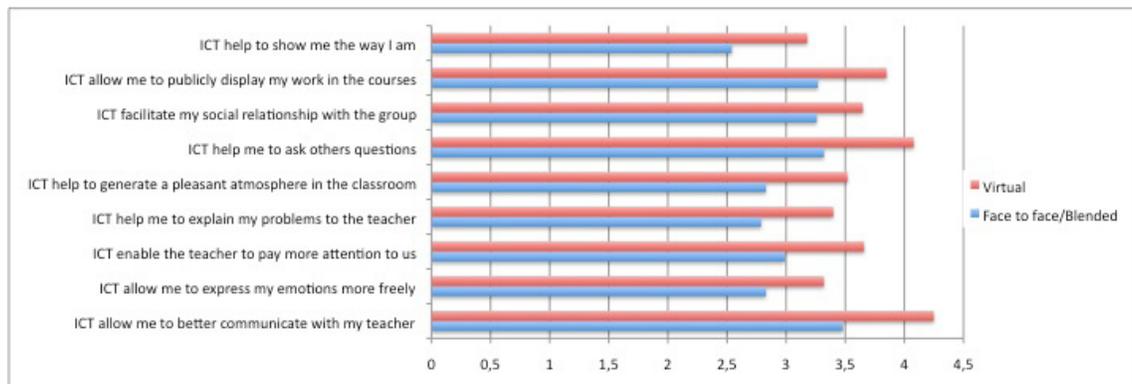


Chart 6. Social dimension.

If we compare the two groups of students in greater detail (Chart 7), the result obtained in percentages of agreement and disagreement in the case of the cognitive dimension becomes even more evident, clearly highlighting the gap between the groups for all levels of response.

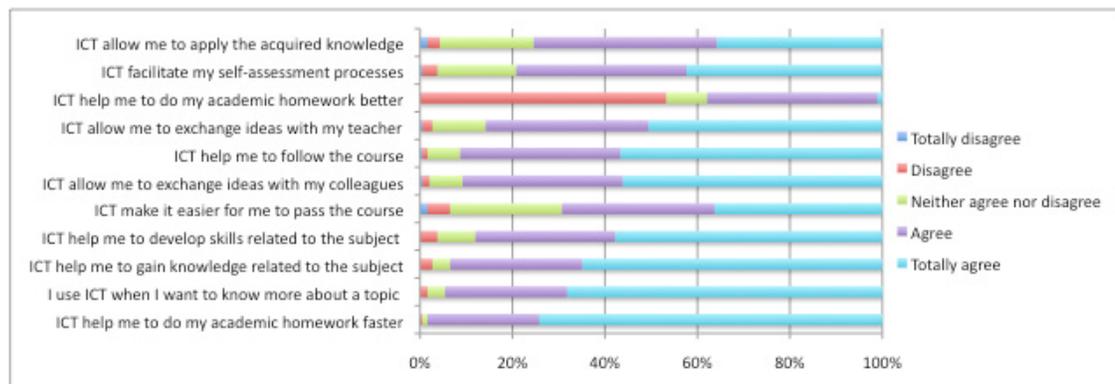


Chart 7. Cognitive dimension.

Chart 8 shows that the levels of disagreement and indifference are also higher in the group of students at face-to-face/blended universities. In the first case, these levels reach 10% of responses to some statements, and in the second case, they hit 40%.

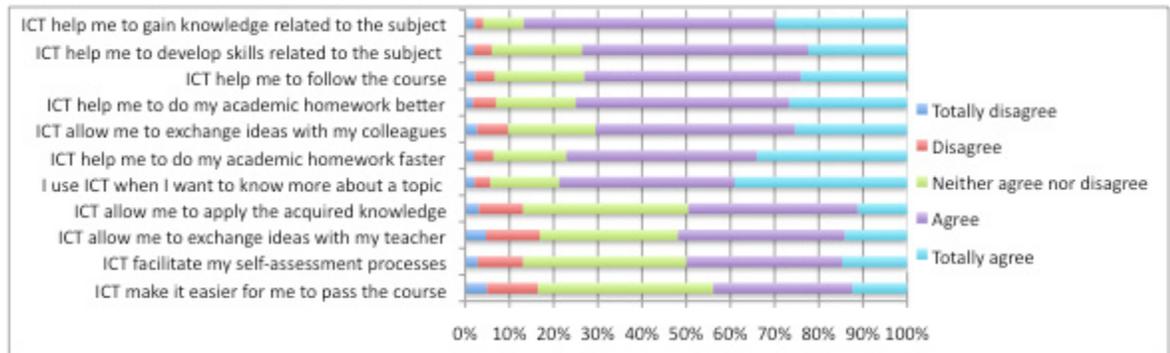


Chart 8. Content dimension.

In the case of the teaching dimension, this same gap can be clearly observed between the two charts (9 and 10), with some significantly higher proportions in the levels of agreement expressed by the online students, and lower in levels of disagreement.

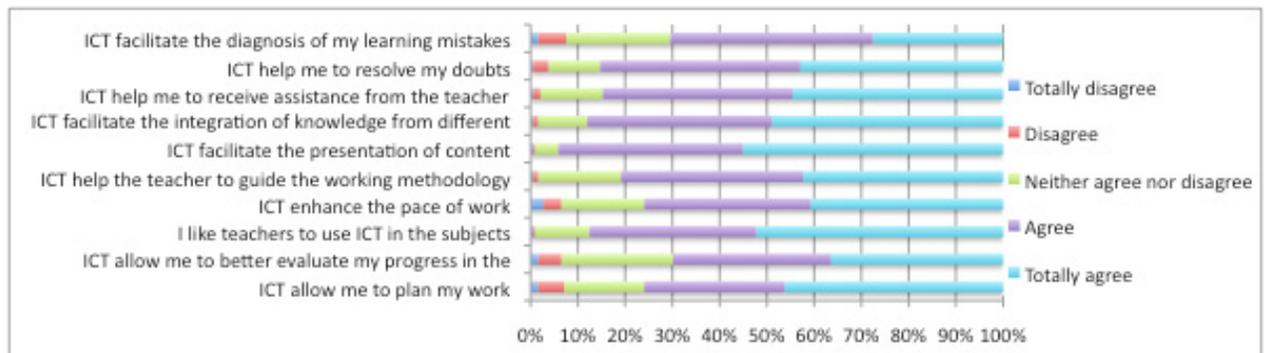


Chart 9. Perception of the use of ICT in virtual environments (teaching dimension)

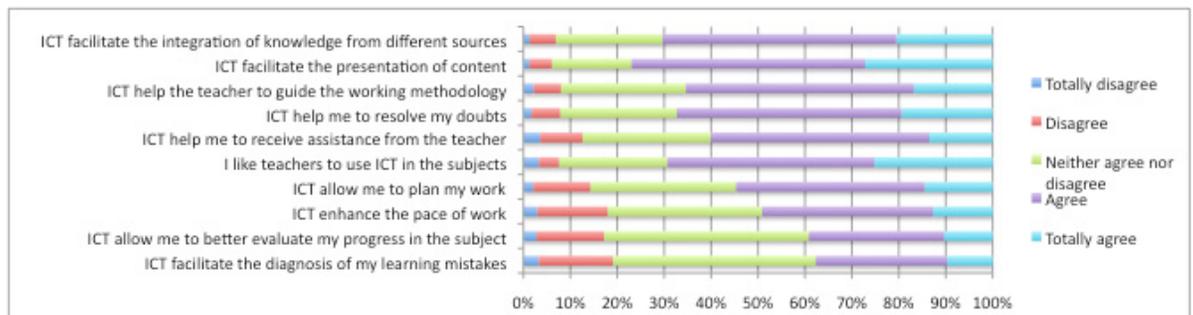


Chart 10. Perception of the use of ICT in face-to-face environments (teaching dimension)

## Discussion and Conclusions

This research confirms many of the general points found in studies outside of Spain in relation to the level of technology access and use. The data obtained in this study shows that the university students in our sample have frequent and widespread access to technologies. They use technology on a daily basis, especially mobile telephones and some Internet applications. The conditions in terms of the availability and use of technologies are not different for younger and older students, and are quite generalised within the population

entering the university. However, the use in everyday life is different. Young students are more active in communication and leisure activities, while older students are more focused on activities related to academic purposes.

Students perceive themselves as fairly competent in most areas (communication, creation, etc.), although the data does not indicate that these competences are necessarily reflected in the normal performance of academic tasks. Moreover, the results show important contradictions between the perception of technological proficiency and its use, which is much more restricted.

The students choose to use the Internet to search for information and they use their universities' virtual campuses as a gateway to the learning material for their courses. These findings are supported by previous research (Caruso & Kvavik, 2005; Jones, Ramanau, Cross, & Healing, 2010), which identify very habitual use of virtual campuses in traditional face-to-face universities.

General types of technology (computers, mobile telephones, and the Internet) are used for rapid communication and convenient access to services and information. If we look beyond these technologies and well-established tools, we find considerable variation in patterns of access, use, and preference for a wide range of different technologies. These results are similar to the findings in the work of Kennedy et al. (2008), and they contradict the key assumptions maintained by authors such as Prensky (2001) regarding the cognitive development of digital natives. It is becoming increasingly clear that although most university students have a basic set of technological abilities, these do not necessarily translate into sophisticated skills in the use of other technologies or information literacy in general.

Although access to and use of ICT is widespread, the influence of teaching methodology is very decisive. For academic purposes, students seem to respond to the requirements of their courses, programmes, and universities, as suggested by Brown and Czerniewicz (2008). In all cases, there is a clear relationship between the students' perception of usefulness regarding certain ICT resources and the teachers' suggested uses of technologies. The most highly rated technologies correspond with those proposed by teachers. In face-to-face environments, the pedagogical model seems to be based on a traditional model in which the teacher provides the content and students value the use of ICT to present this content. In online environments, students perceived technology as supporting learning and communication. In this case, the value of ICT is not related to the content but to the learning process.

Greater use of technology for educational purposes also seems to condition the students' typical uses. Therefore, the students in virtual environments use technologies mainly for informative and educational purposes, while the students in face-to-face environments use ICT for leisure and communication. According to Margaryan and Littlejohn (2008, p. 4), a factor that may determine the types of tools students use and how they use them may be students' expectations of how they will learn at university. These authors investigated university entrants' expectations of how they would learn and what technologies they would be using at university over a four-year period. A key finding of this study is that despite a

dramatic increase in students' use of various technologies, their expectations of how they might learn at university remained relatively static over the four-year period. The expectations of learning at university appear to be influenced more by students' prior experience of learning in formal situations rather than by their use of technology outside educational settings.

We can see important differences that are reflected not only in each dimension but also in the interrelations between them. The results obtained effectively demonstrate important differences in the three dimensions between the online students and those at the traditional universities. The perception of ICT use from the cognitive perspective is more positive among the students at the virtual university with respect to indicating greater efficiency in obtaining learning results, in aspects linked to self-regulation and the learning process. The social dimension is also higher in the online environment and is particularly interesting in the statements that refer directly to aspects of communication with teachers and relationships with colleagues. Nevertheless, it is interesting to note that the social dimension is valued lower than the other two by both groups of students. It remains to be determined if the reason is their minor interest in ICT social support during learning processes or the lack of adequacy of university virtual environments to bring support to social aspects.

The results of this study highlight differences between the students at face-to-face universities and at online universities, both in terms of technology usage and levels of perceived competence in these uses. The results have several implications. Firstly, it indicates that student-focused methods are possible in online teaching. The second implication follows from the first: the study indicates that teachers in face-to-face contexts need to focus not only on online materials, but also on how the use of ICT can support learning. This suggests that if teachers want students to get the most out of learning online in traditional contexts, then teaching strategies need to value the interaction with the teacher and the students. Online learning is not only part of the experience of students at a distance, it is an important aspect of campus-based student experiences.

Finally, the results of the study lead us to suggest the need to consider that technology-rich learning environments foster students' digital competencies (and not the other way around).

## Acknowledgements

This article analyses the partial results of research funded by the Ministry of Science and Innovation, under the title *Uses of ICT among university students: Academic and social perspective of the mediated learning processes* (EDU2009-12125).

## References

- Bayne, S., & Ross, J. (2007). *The “digital native” and “digital immigrant”: A dangerous opposition*. Paper presented at the annual conference of the Society for Research into Higher Education (SRHE), Brighton, Sussex, England.
- Brown, C., & Czerniewicz, L. (2008). *Trends in student use of ICTs in higher education in South Africa*. 10th Annual Conference of WWW Applications, Cape Town, South Africa. Retrieved from [http://www.cet.uct.ac.za/files/file/ResearchOutput/2008\\_wwwApps\\_UseTrends.pdf](http://www.cet.uct.ac.za/files/file/ResearchOutput/2008_wwwApps_UseTrends.pdf)
- Bullen, M., Morgan, T., & Qayyum, A. (2011). Digital learners in higher education: Generation is not the issue. *Canadian Journal of Learning & Technology*, 37(1).
- Caruso, J. B., & Kvavik, R. (2005). ECAR study of students and information technology, 2005: Convenience, connection, control, and learning. *EDUCAUSE*. Retrieved from <http://net.educause.edu/ir/library/pdf/ers0506/rs/ers0506w.pdf>
- Dabbagh, N. (2007). The online learner: Characteristics and pedagogical implications. *Contemporary Issues in Technology and Teacher Education*, 7(3), 217–226.
- Garrison, D. R., Anderson, T., & Archer, W. (2001). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education*, 2(2–3), 87–105.
- Helsper, E., & Eynon, R. (2009). Digital natives: Where is the evidence? *British Educational Research Journal*, 36(3), 503–520.
- Jones, C., Ramanau, R., Cross, S., & Healing, G. (2010). Net Generation or digital natives: Is there a distinct new generation entering university? *Computers and Education*, 54(3), 722–732.
- Kennedy, G., Judd, T. S., Churchward, A., Gray, K., & Krause, K.-L. (2008). First year students' experiences with technology: Are they really digital natives? *Australasian Journal of Educational Technology*, 24(1), 108–122.
- Kirkwood, A., & Price, L. (2005). Learners and learning in the 21st century: What do we know about students' attitudes and experiences of ICT that will help us design courses? *Studies in Higher Education*, 30(3), 257–274.
- Kirschner, P. A., & Karpinski, A. C. (2010). Facebook® and academic performance. *Computers in Human Behavior*, 26(6), 1237–1245.
- Margaryan, M., & Littlejohn, A. (2008). *Are digital natives a myth or reality?: Students' use of technologies for learning*. Caledonian Academy, Glasgow Caledonian University, UK. Retrieved from <http://www.academy.gcal.ac.uk/anoush/documents/DigitalNativesMythOrReality-MargaryanAndLittlejohn-draft-111208.pdf>

- Oblinger, D. G., & Oblinger, J. L. (Eds.) (2005). *Educating the Net Generation*. *EDUCAUSE*. Retrieved from <http://www.educause.edu/ir/library/pdf/pub7101.pdf>
- Prensky, M. (2001). Digital natives, digital immigrants. *On the Horizon*, 9(5), 1–6.
- Prosser, M., & Trigwell, K. (1999). *Understanding learning and teaching: The experience in higher education*. Buckingham: SRHE and Open University Press.
- Ramsden, P. (2002). *Learning to teach in higher education*. London: Routledge.
- Romero, M., Guitert, M., Bullen, M., & Morgan, T. (2011). Learning in digital: An approach to digital learners in the UOC Scenario. *European Journal of Open, Distance and E-Learning*. Retrieved from [http://www.eurodl.org/materials/special/2011/Romero\\_Bullen\\_Morgan.htm](http://www.eurodl.org/materials/special/2011/Romero_Bullen_Morgan.htm)
- Selwyn, N. (2008). An investigation of differences in undergraduates' academic use of the Internet. *Active Learning in Higher Education*, 9(1), 11–22.
- Tapscott, D. (1998). *Growing up digital: The rise of the Net Generation*. Toronto: McGraw-Hill.

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## Mobile Microblogging: Using Twitter and Mobile Devices in an Online Course to Promote Learning in Authentic Contexts



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### Abstract

This research applied a mixed-method design to explore how best to promote learning in authentic contexts in an online graduate course in instructional message design. The students used Twitter apps on their mobile devices to collect, share, and comment on authentic design examples found in their daily lives. The data sources included tweets (i.e., postings on Twitter), students' perceptions about mobile microblogging activities, and self-reported Twitter usage. Based on the tweet analysis, we found that the students appropriately applied the design principles and design terms in their critique of design examples. While the students were mainly engaged in assignment-relevant activities, they spontaneously generated social tweets as they related peers' authentic design examples to their own life experiences. Overall, they had positive perceptions toward the mobile microblogging activities. The students also indicated that the design examples shared by peers through mobile microblogging inspired their own message design work. We synthesized instructional design suggestions and challenges for educators interested in incorporating mobile microblogging in their instructional settings.

**Keywords:** Twitter; microblogging; mobile learning; social learning; online course; Web 2.0

## Introduction

The recent advances in mobile devices make mobile learning possible through the powerful computing capability built into their conveniently small sizes, their Internet connectivity, and the availability of many types of easy-to-use mobile software applications (“mobile apps” hereafter) (Johnson, Levine, Smith, & Stone, 2010). The major affordances of mobile computing technologies for learning include (a) mobility, the small sizes of the devices, making them highly portable, which enhances user mobility (Brown, 2009) and easy access to mobile devices; (b) computing power, relatively strong computing power, which enables users to complete tasks on small devices as effectively as on larger and less portable devices (Lai & Wu, 2006); (c) connectivity, always-on and stable Internet connectivity with high bandwidth, which allows for instant access to large amounts of information and real-time communication regardless of location (Johnson, Smith, Willis, Levine, & Haywood, 2011). These features unleash tremendous possibilities for innovative uses in education.

Mobile technologies have the potential for innovative educational use because they allow learning to occur in authentic and meaningful contexts. Because of the mobility and strong computing power of mobile technologies, learning becomes ubiquitous and seamless (Liu, Tan, & Chu, 2009). Learners can now take mobile devices anywhere they want in order to execute tasks or continue their learning processes outside classrooms or traditional learning environments. Learners can also go into the field, where they can apply their knowledge and skills in real-world settings. For example, mobile devices equipped with cameras and GPS (global positioning systems) make possible a variety of educational uses, such as data collection and documentation in field learning and field research. Together, all these advantages allow mobile device users to learn in their desired or preferred locations and physical contexts.

In addition, the connectivity of mobile devices promotes social learning through communication and collaboration among learners (Zurita & Nussbaum, 2004). Social learning usually involves a group of learners who interact collaboratively to develop their knowledge or expertise in order to achieve their goals. Through sharing knowledge and experiences, learners can develop knowledge related to their field or their interests (Lave & Wenger, 1991). Mobile devices afford rich and varied opportunities for the communication and sharing (Motiwalla, 2007) critical to collaborative knowledge construction. In addition, learners can enjoy frequent and easier access to the Internet because they can be connected to the Web virtually anywhere. With the blossoming of Web 2.0 applications that emphasize participation and sharing (O’Reilly, 2005) and the increasing availability of Web 2.0 applications on mobile devices, learning can now be enhanced in both mobile and social contexts.

## Microblogging: A Web 2.0 Application for Social Learning

Web 2.0 applications, designed for communication, creation, and sharing, allow for collective and cooperative creation of content and knowledge through easy and dynamic communication and publication mechanisms (Hsu, Ching, & Grabowski, 2009). Unlike the passive knowledge consumption model of web use, Web 2.0 applications encourage and make

possible a participatory web where individuals contribute and participate in the creation of content and knowledge—together. As such, Web 2.0 applications can provoke different learning perspectives, including sociocultural, situated, and distributed views (Ching & Hsu, 2011; Hsu, Ching, & Grabowski, in press). Among these perspectives, social learning is particularly pertinent to Vygotsky's sociocultural theory, which holds that learners construct knowledge through intellectual exchanges during their social interactions. In this view of learning, the social environment plays a critical role in enabling individuals' development and learning (Tudge & Scrimsher, 2003). Considering their nature and purpose, Web 2.0 applications are ideal mediators for creating social environments conducive to social learning (Gunawardena et al., 2009) and helping to achieve social presence (Dunlap & Lowenthal, 2009). With these applications, social engagement critical to learning is extended beyond the cultural perspectives of a local community to groups that are diverse and geographically dispersed, such as groups of learners in online learning environments. Social learning enhanced by Web 2.0 applications is likely to increase motivation (Pauschenwein & Sfiri, 2010) and create relatedness and a sense of community (Wright, 2010) among learners.

Microblogging is one of the latest Web 2.0 applications and can best be exemplified by the highly popular Twitter application (Ebner, Lienhardt, Rohs, & Meyer, 2010). Like blogging, microblogging allows for personal publication and conversation between writers and readers. One unique key feature of microblogging is the short-and-sweet constraint it poses—the limited number of characters per entry. Twitter, for example, allows for only 140 characters per post. This prevents long-winded entries and forces microbloggers to post concise messages. While this format of publication may not allow for in-depth composition in any single entry, the lightweight requirement and mechanism make it easier for people to follow up on conversations and give immediate feedback (Ebner et al., 2010) because individuals do not need to put in too much time and effort at once. The short messages are very similar to exchanges of real-time text chat on Instant Messenger. However, Twitter does not impose time pressure on the conversant on either end for responding or turn-taking because it does not require synchronous presence. Participants in microblogging only get involved when they feel like it. In addition, microblogging applications allow users to easily share resources such as hyperlinks to web-based multimedia, including images or videos.

In some educational contexts, microblogging has been used for back-channel chat to enhance the communication between the presenter and audience. For example, Elavsky, Mislan, and Elavsky (2011) studied students using Twitter for in-class feedback and asking questions during lectures with large audiences (approximately 240 students in their study), where the customary method of asking questions by raising hands could have interrupted the flow of the class. Although Elavsky et al. found that students' class participation and enthusiasm improved, about 47% of the students did not actively use Twitter (posting one or no tweets) for class activities. While this type of microblogging activity helps improve class dynamics, it does not exploit the full potential for social learning because it mainly encourages instructor-to-student communication and lacks peer-to-peer interaction.

In other educational situations, microblogging was used as a social networking tool to pro-

mote social interaction and community building. Wright (2010) studied how microblogging helped education students develop self-reflective practices during their practicum. As the participants in Wright's study were required to regularly record and share their thoughts about their teaching practices using Twitter, they reported that they valued the constant contact within the community that was built using the microblogging (i.e., Twitter) because the interaction mitigated their feelings of isolation. Also, Waller (2010) incorporated Twitter to help struggling writers (primary school students) communicate their thinking to each other. It was found that students enjoyed writing and felt excited because they had a real audience that included not only their classmates but also other followers beyond the class.

From the learning perspective, microblogging fosters intellectual exchanges among students or between students and the instructor, through asking questions, giving feedback, exchanging ideas, sharing resources, and reflecting on learning (Ebner & Maurer, 2008). Examining college students using microblogging for project-oriented communication, Ebner et al. (2010) found that this tool supported informal learning and social interaction during group work. They also found that microblogging enhanced process-oriented learning because learners were able to help shape each other's developing ideas through posting thoughts and information pieces.

Microblogging applications have recently become available on mobile devices, and users can benefit from the mobility, computing power, and connectivity of mobile devices during microblogging. This availability, therefore, takes learning through microblogging to the next level—mobile social learning. Namely, social learning can now go with learners truly anytime, anywhere, and with ease. This enables both social learning and learning in authentic contexts that learners create, share, and communicate in real time. For example, learners who find good examples (e.g., photos) related to their learning can create a “sample” through the camera on their mobile devices, share it with peers through Twitter, and communicate their thoughts with short messages. Mobile social learning thus provides an environment where users can build an authentic learning context for their collaborative knowledge construction. The use of mobile social learning has opened up promising opportunities for social interactions, especially for learners in online learning environments who rely heavily on technology for communication.

## Research Purpose and Questions

This study investigated the impact of mobile microblogging on students' participation in authentic learning. The following research questions guided this study:

- What kind of interactions are students engaged in when participating in mobile microblogging activities? Are the tweets more about designated coursework or social conversation? What kinds of social conversation would students be engaged in?
- How do students benefit from learning that is situated in authentic contexts and enabled by mobile microblogging?

Through this study, the authors aim to (a) provide useful design suggestions for educators to incorporate mobile microblogging in online learning in meaningful and engaging ways, and (b) explore challenges in design and implementation in order to inform instructional design decisions.

## Methods

### Study Context

This study was implemented in a fully online graduate course in instructional message design in a mid-size state university in the northwestern United States. This online course was hosted on the Moodle learning management system (LMS) provided by Moodlerooms, Inc. The goal of the course was to have students learn to apply learning and design theories and principles in order to select, combine, and design visuals to effectively communicate instructional information. With emphasis on instructional message design, students in class learned about visual graphic design principles and created graphics for instructional use in their own professional settings. The 16 students enrolled in this course included K-12 teachers, school technology specialists, military personnel, and corporate trainers. Students in this course were required to have smartphones or mobile devices with Internet and camera capability. With the mobile learning component being funded by a university grant (i.e., mLearning scholars), students had the option of purchasing a subsidized mobile device (i.e., the fourth-generation iPod Touch) if they did not have one or needed one for this course.

### The Mobile Microblogging Activities in this Study

The mobile microblogging activities, lasting for nine weeks, were designed to help students leverage the potential of mobile computing and the Web 2.0 application Twitter during their learning. The goal of the activities was to extend students' learning context from the content in class to their authentic real-life settings. Each week, each student was required to post at least one original tweet with one graphic design example collected from his/her environment and to comment on the collected design examples. The students were encouraged to share examples related to each week's design topic, such as typography, color, or shape. Also, they were asked to reply to at least two peers' course-related tweets each week. In the activities, students took advantage of mobile device capabilities, documented design examples from their daily-life contexts using the on-device camera, concisely commented on design examples, and shared those examples with the class via Twitter mobile apps. In both original and response tweets, the students were instructed to include a hashtag followed by a designated course-related keyword so their tweets could be searched and located on Twitter by their peers.

The activities were designed to help students become more observant designers by having them consciously attend to potential graphic design examples in their daily lives and evaluate which design techniques/principles they learned in class applied to those examples. This allowed students to reciprocally connect in-class and out-of-class learning and fos-

tered learning in individuals' authentic contexts (e.g., design examples from a gas station on how to use gas pumps, emergency evacuation instruction) through interaction among peers via mobile microblogging. Students could also obtain inspiration for their own design work through the examples collected by themselves and their peers. Because the examples were not simply retrieved from the image search on search engines or photo sharing sites but were associated with peers' life experience, they carried contextual meaning associated with their peers in terms of time, place, and people, which could arguably be more lasting in one's learning experience.

## Data Sources and Analysis

This study applied a mixed-method design. The tweets collected from students' microblogging activities were the major data source in this study. Students' tweets were analyzed using a qualitative method first, through open coding and constant comparison. The tweets were first imported into a spreadsheet and coded as original postings and replies. Students' retweets (i.e., tweets reposted from other resources) were not included in analysis since they were neither original tweets nor replies to peers' tweets. Strauss and Corbin's (1990) constant comparison method was then applied in data analysis in this study. With open coding, the authors developed coding schemes to examine the types of tweets. After open coding, the authors constantly compared the data and revised the categories based on the themes emerging from the data through continuous meaning negotiation. After coding and categorizing the tweets, quantitative analysis was applied to help reveal the extent of distribution of different types of tweets in our data set.

In addition to students' tweets, we conducted an online survey on students' perceptions about the mobile microblogging activities at the conclusion of the activities. The questions included the following:

1. Does the microblogging (Twitter) activity help you feel more involved in class as part of a learning community? Why or why not?
2. What do you like most about the microblogging (Twitter) learning activity in this course?
3. What do you dislike most about the microblogging (Twitter) learning activity in this course?

We also asked questions about students' Twitter experience before the mobile microblogging activities, such as whether they had used Twitter and, if so, which types of devices they had used to access Twitter. At the end of the activities, students provided information about the devices they used to share and discuss the design examples in this course.

## Results and Discussion

### Participants, Mobile Devices, and Time on Microblogging

Ten of the 16 enrolled students participated in this study. Before the microblogging activities in this class, four of the ten students had never used Twitter before. Among the six students who had used Twitter, four of them used smartphones to access or post on Twitter, one used a tablet computer, and one used a desktop computer. At the end of the microblogging activities, seven students were using their smartphones, two used iPod Touches, and one used a tablet. The tweet data of two participants were excluded from analysis because one of them participated minimally, with four original tweets and no replies, and the other removed her Twitter page altogether after this course. While students' time on collecting design examples could vary because finding the examples was incidental, we found that they did not spend much time during any of the nine weeks on microblogging. For each week, two students reported they each spent half an hour, three students each 10 minutes, and the other five students each less than 10 minutes on course-related Twitter activities. Regarding the frequency of checking Twitter, one student checked once a day, two students checked five times a week, three students checked three times a week, and the other four checked fewer than three times a week.

### Tweet Analysis

During the nine weeks of activities, each student was required to post a minimum of nine original assignment-relevant tweets and 18 replies. On average, each of the eight students participating in this study posted 14 original tweets (see Category 1 in Table 1) and 28 replies (see Category 2 and Category 4 in Table 1). The average numbers of both original tweets and replies were 56% more than the required numbers. It is likely that the 140-character constraint makes posting tweets less overwhelming, and therefore participants were more willing to access the mobile devices for microblogging. It is also possible that the easy access and always-on connectivity of their mobile devices made it possible for students to check and reply often.

We collected and analyzed a total of 361 tweets posted by the eight participants. During our data analysis, we found and defined the following six coding categories emerging from the tweet data. The coding categories and descriptions of the categories are summarized in Table 1 below.

Table 1

*Tweet Coding Category and Description*

Category number	Coding category	Description
1	Assignment-relevant original tweets	Including tweets directly relevant to the assigned task of posting and commenting on one's own design example collected from his/her daily environment.
2	Assignment-relevant replies	Including tweets relevant to the assigned task of replying to peers' posted design examples.
3	Other course-relevant tweets	Including tweets on resources sharing; seeking help on Twitter usage (e.g., how to tag tweets or use tags for filtering); responding to other coursework questions; and reflection on learning.
4	Social tweets derived from assignment	Including replies on assignment regarding daily-life experience rather than graphic design aspects.
5	Social tweets not derived from coursework	Including tweets that did not originate from the assigned microblogging task but were rather general greetings among class members.
6	Resource-sharing tweets after the course ended	Sharing course-relevant resources.

Categories 1, 2, and 4, which contained 330 tweets (91% of all analyzed tweets), were related to the assigned microblogging tasks regarding collecting and sharing design examples. Figure 1 below provided a graphical summary of tweet distribution by category.

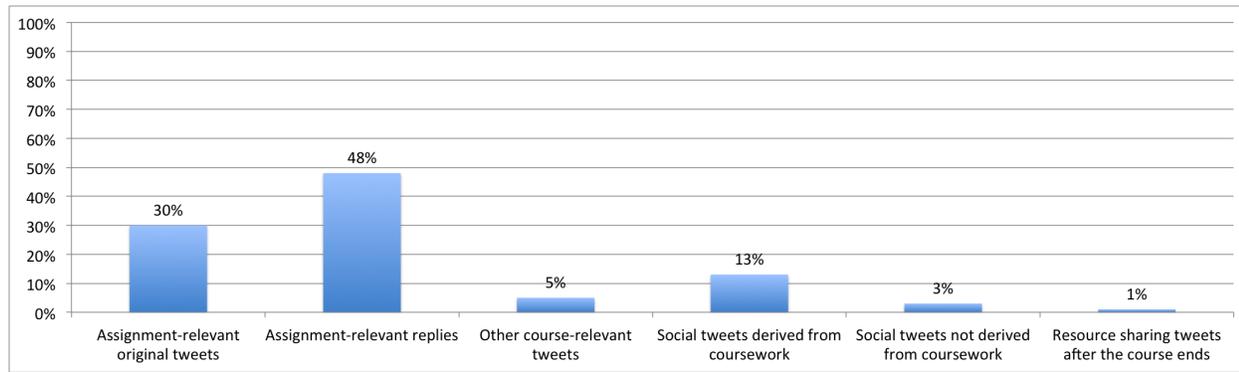


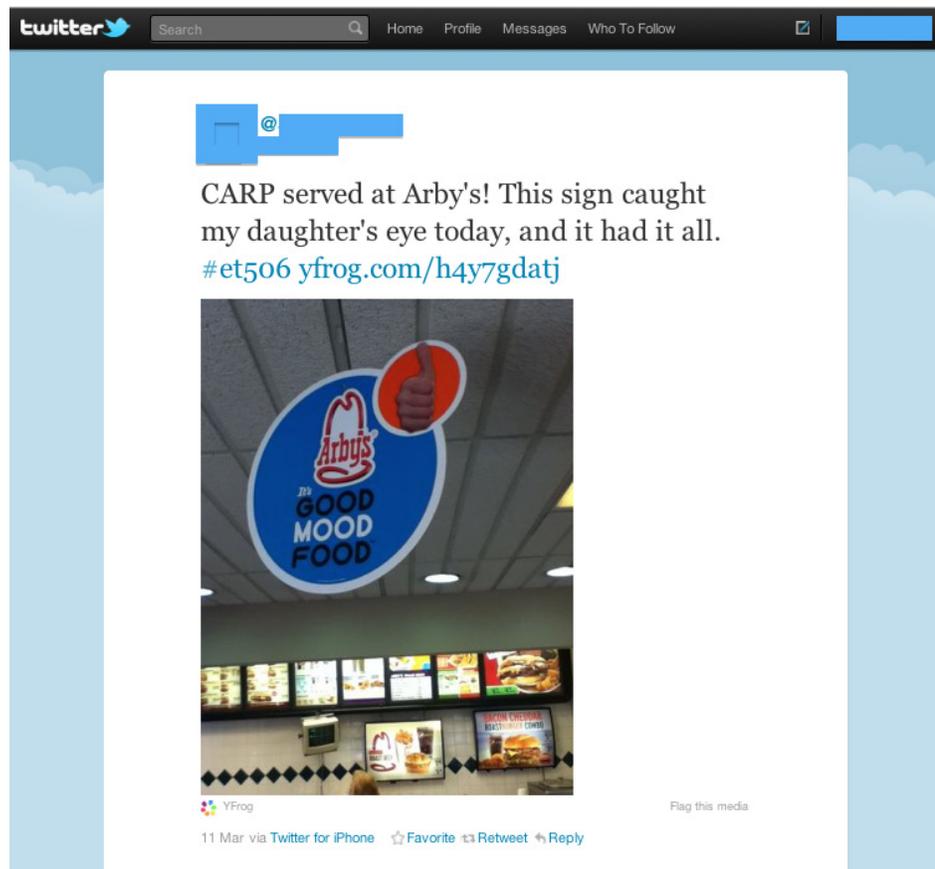
Figure 1. Tweet distribution by category.

In the following section, we discuss the different types of tweets in more detail and provide examples of these tweets.

*Assignment-relevant original tweets* (110 tweets; 30% of all tweets). This category includes the tweets that consisted of links to design example images found in authentic environments and documented by students, with concise comments on the contexts and design aspects of the images. For example, one student commented on a poster: “White space? No, black space, but same concept. I liked the balance on the page provided by the openness.” [Image URL].

Another student posted about a commercial delivery package of a movie renting service: “color and depth, good contrast, drop shadow gives pop to the word.” [Image URL]

As Figure 2 illustrates, one student shared a design example spotted by his daughter at a fast food restaurant. This figure shows the student posting this example and concisely commenting on the design principles (CARP—contrast, alignment, repetition, and proximity) being incorporated. This tweet showed another interesting aspect of this activity—some students often involved their family in their learning because it occurred in authentic family contexts, which also revealed the potential of mobile devices for learning in authentic settings. In this particular example, social learning has also been extended beyond the class because it involved interaction among family members, making it even more relevant and motivating.



*Figure 2.* A tweet with a design example and concise comment on its context and design principles.

Most students were very active in this category and went beyond (56% more) what was required in terms of the numbers of postings. In examining the content of these tweets, we found that students, as observant learners, were able to use relevant design principles and terms to analyze and critique design examples found in their authentic contexts.

*Assignment-relevant replies* (173 tweets; 48% of all tweets). This category includes replies on the design aspects of the examples posted by peers. For instance, one student commented on the design technique of a peer's example: "they probably just bend the words along a path. That would be my best guess. Perhaps it[']s more sophisticated than that?"

Another student provided rationale for agreeing on the negative aspects of a design example: "Agreed. Too much motion. Not enough contrast w/ centered text on dark shape."

From the tweets quoted here, we found that although there is a conservative character limit per tweet, students did a good job of concisely analyzing design technique and critiquing examples using technical terms that they learned in this course.

The tweets included in Categories 1 and 2 provide examples of how learners can co-construct

graphic design knowledge/ideas through intellectual exchanges during social interactions via microblogging. It is worth noting that the students were very motivated to post more than 50% of the required number of tweets in both categories—they co-constructed knowledge with each other through active original postings and replies. These types of tweets also showed that students engaged in conversation that extended beyond their coursework and was at the same time situated in their real-life experience. Authentic graphic design ideas and examples were found in the social and cultural contexts surrounding the learners.

*Other course-relevant tweets* (18 tweets; 5% of all tweets). This category includes various tweets other than those related to sharing and commenting on design examples. One student shared a web resource featuring online pedagogy useful in general instructional design. Another student used Twitter to offer peers some tips about Twitter usage. Yet another student was inclined to seek help on Twitter usage on such questions as how to tag tweets or use tags for filtering tweets. An interesting use of tweeting in this category was to reflect on one's changes and learning during the course. One student asked his peers: "do [yo]u find [yo]urself looking at signs & designs differently since class began?"

Another student had a similar observation and stated, "It's really funny how this class has changed my perspective of the simplistic things like an instrument panel in a car."

These types of tweets seemed to indicate the Twitter environment could provide a casual atmosphere where students felt comfortable and willing to share the changes in their own learning and expose gaps in their knowledge.

*Social tweets derived from assignment* (47 tweets; 13% of all tweets). This category included tweets about how students related their own personal life experiences to peers' design examples. For instance, one student asked another student about his cooking plan after reviewing the design example of a seafood package. The student being asked responded, "Sorry, no grilling tonight. Was at Whole Foods and thought the fish would make a good background for the graphic."

On a graphic design example of gas pump instruction, one student commented: "Everyone assumes pumping gas can be figured out by all. My wife is from NJ. No self serve there. She had no clue how to."

This conversation was then joined by a tweet from another student: "I'm pretty sure in Oregon, they pump gas for you... That threw me for a loop when driving thru..."

The tweets in Category 4 showed that seeking real-life experience enabled students to bring their daily lives into their course discussions, which was conducive to sparking social exchange among the members in the community. These social exchanges, while not solely focusing on the content of this course, helped build connections among members and made them relate to each other through sharing experiences regarding various aspects of their lives. In accordance with Gunawardena et al. (2009), the microblogging platform, a type of Web 2.0 application, served as an ideal mediator to create an environment for learning and

developing graphic design knowledge and principles socially.

*Social tweets not derived from coursework* (11 tweets; 3% of all tweets). Some students simply connected with other students through compliments, greetings, or discussing the weather and the economy, without referring to any coursework. For example: "...like your user name!" or "Not a fan of drizzly and cloudy anymore. I like the sun. How's the economy doing there these days?"

This type of social tweet was not as common in this course, and 91% of these tweets came from one student. Comparing the distribution of tweets in Category 4 and Category 5, it seems the students were usually more engaged in assignment-relevant social tweets.

*Resource-sharing tweets after the course ended* (2 tweets; 1% of all tweets). Only one student posted this type of tweet, where he shared a Twitter mobile app with the instructor. This type of activity is not common. It could have to do with the student's interest in using Twitter as a social tool, as reflected through his continuous updates on Twitter. At the time of our in-depth tweet analysis (four months after this course), two of the eight participants still updated their Twitter postings for personal use.

While the instructor intended to have students focus on discussing design aspects of the shared examples via Twitter, the instruction did not specifically prompt students to do so because the instructor wanted to observe the spontaneous relative contributions of learning tweets versus social tweets. Of all 220 coursework-relevant replies (i.e., Categories 2 and 4), 79% were learning tweets and 21% were social tweets. The distribution of types of tweets seemed to reveal a major emphasis on learning aspects accompanied by a certain level of social bonding. This is likely due to the assignment being situated in the students' daily lives, which meant they could relate to their peers' examples if they had encountered similar life experiences or design examples. The convenience of accessing Twitter apps on mobile devices and the nature of short messaging on Twitter also allowed for quick posting without needing to extensively compose a message, which made it easier to connect with peers in a casual way.

While the instructor hoped that students would focus on design issues during their microblogging activities, social interaction during microblogging was not discouraged because social activities could be vital "glue" in helping students connect with each other and become more engaged in the activities—students could feel more bonded at a personal and social level. The spontaneous social interactions found in the tweets (e.g., mentioning personal dining plans or a wife's hometown) suggest that some students were able to identify with the community and found this microblogging a trusting environment in that they were willing to share their personal information or events with the learning community to build interpersonal relationships.

## Benefits of Learning in Authentic Contexts with Mobile Microblogging

*Promoting learning in authentic contexts.* The data collected from the survey showed that students enjoyed mobile microblogging activities that helped connect learning with peers' everyday lives. One student commented that

It provides an opportunity to seek out examples of content in the real world, and it is unique to one person because of the spread out nature of the students in the class (all over the world!). It is exciting to share findings with the class and comment on others' finds.

One student commented on becoming conscious of design principles applied to things in the environment: "I liked the way that it made me aware of all of the things that I read about being applied in everyday life. Examples of design that may have gone unnoticed by me were caught."

*Reinforcing formal learning with informal learning.* Students also found that the activities helped them with course-relevant learning. For example: "I did appreciate learning how to use Twitter, and I do like seeing a few examples of graphics since some helped to generate ideas for my own projects."

Sharing images provided a means to ground some of the textbook concepts as well as others' understanding of those concepts.

*Enhancing social learning.* In addition, students liked Twitter as a tool for social learning: "The class did feel a bit more like a community after starting this activity," "it's more of an informal way to connect with your fellow colleagues."

Overall, the students showed positive attitudes toward the mobile microblogging activities. They found mobile microblogging helped them learn about design examples that were authentic in individuals' contexts and widely geographically dispersed. The students also found that the activities helped them see how the design principles learned in class were actually applied to the design artifacts in their environments. In addition, they learned from peers' views about design and could connect with peers in an informal way.

## Instructional Design Implication and Challenges

Our exploration of the different categories of tweets can help inform designing and planning of mobile microblogging for learning in authentic contexts. Instructors can consider the types of tweets (e.g., replies on design aspects or life experiences) they want to solicit and engage students in, and design instructions or prompts that help lead to outcomes aligned with their instructional objectives. The character limit of microblogging may enable a unique mode of communication. While students who prefer extended comments in single postings could find it inconvenient, the lightweight nature of microblogging eases the pressure of extended participation. Despite the character limit, microblogging can help to bring about deep conversation through short but frequent exchanges. While participants might

not be able to make a complete argument in one posting, microblogging is likely to promote the opportunity for co-construction of knowledge when participants take turns in elaborating or adding to others' short postings to make their own points clearer.

Implementing a program involving mobile microblogging activities requires early planning and communication. While students' participation and engagement in our mobile microblogging activities exceeded course requirements and instructor expectations, it was not without challenges. In terms of logistics, the instructor had to ensure that everyone in class had access to a mobile device with a camera feature so they could participate in the required tasks. It took some planning in advance to survey students' mobile device accessibility either before or early in the course. Fortunately, most students in this study (i.e., graduate students who are working professionals) owned a smartphone or at least planned to get one by the beginning of the activities. Students who did not have such mobile devices could purchase a subsidized device with the help of the first author's grant funding. If this type of resource were not available, it might be difficult to get all of one's students ready for such activities. In fact, we found that some students were not interested in purchasing the device even with the funding support. In this situation, instructors would want to make sure they could develop alternative activities so that students' learning opportunities were not compromised. In our situation, there was another section of the same course, so the instructor could arrange microblogging activities that did not require mobile devices with the camera feature. In situations where another section of the same course is not available, instructors might have to create two sets of instructions and accommodate two different learning groups in one course.

One student commented on the nuisance of having to remember to include a required hashtag-keyword combination (for searching and filtering) in posting tweets. While there is instructional and learning value in using tags for learning activities, this requirement further reduced the content posting quota because the keyword counted toward the character limit per tweet on Twitter. If learners engaged in conversation with peers, they would also need to include "@username" so the tweets could be directed to the conversant, which further reduces the amount of substantive content one can post in one tweet. Educators interested in incorporating Twitter in their instruction might want to consider these constraints during their planning. It might help to assign a shorter activity keyword or encourage students to create shorter usernames to allow more room for posting in each tweet.

## Conclusions

In this study, we showed how to promote learning in authentic contexts through mobile microblogging. The affordances (i.e., mobility, computing power, and connectivity) of today's mobile devices and microblogging applications combined to make students' learning in authentic contexts possible. We found that the students in our study appropriately applied the design principles and terms they learned in class when they critiqued the examples collected by themselves and their peers. Students were able to co-construct knowledge through their exchange of tweets. Generally, they had positive perceptions toward the mobile microblog-

ging activities that allowed them to apply their knowledge about graphic design principles in authentic contexts. The students also indicated that the design examples shared by their peers via mobile apps inspired their design work. While being effective in supporting learning, mobile microblogging was also efficient in helping students connect with each other through short and quick social conversations. We hope the study presented here represents a promising example of integrating mobile microblogging in an online graduate course, one that could encourage educators to explore and experiment with the potential of mobile microblogging for promoting learning in authentic contexts and through social learning.

## References

- Brown, I. (2009). Art on the move: Mobility – a way of life. In J. Herrington, A. Herrington, J. Mantei, I. Olney, & B. Ferry (Eds.), *New technologies, new pedagogies: Mobile learning in higher education* (pp. 120–128). Wollongong: University of Wollongong. Retrieved from <http://ro.uow.edu.au/>
- Ching, Y.-H., & Hsu, Y.-C. (2011). Design-grounded assessment: A framework and a case study of Web 2.0 practices in higher education. In J. Waycott & J. Sheard (Eds.), *Assessing students' Web 2.0 activities in higher education* [Special issue]. *Australasian Journal of Educational Technology*, 27(5), 781–797.
- Dunlap, J. C., & Lowenthal, P. R. (2009). Tweeting the night away: Using Twitter to enhance social presence. *Journal of Information Systems Education*, 20(2), 129–135.
- Ebner, M., Lienhardt, C., Rohs, M., & Meyer, I. (2010). Microblogs in higher education – A chance to facilitate informal and process-oriented learning? *Computers & Education*, 55, 92–100.
- Ebner, M., & Maurer, H. (2008). Can microblogs and weblogs change traditional scientific writing? In *Proceedings of e-learn 2008* (pp. 768–776). Las Vegas, NV.
- Elavsky, C. M., Mislán, C., & Elavsky, S. (2011). When talking less is more: Exploring outcomes of Twitter usage in the large-lecture hall. *Learning, Media and Technology*, 36(3), 215–233.
- Gunawardena, C. N., Hermans, M. B., Sanchez, D., Richmond, C., Bohley, M., & Tuttle, R. (2009). A theoretical framework for building online communities of practice with social networking tools. *Educational Media International*, 46(1), 3–16.
- Hsu, Y.-C., Ching, Y.-H., & Grabowski, B. (2009). Web 2.0 technologies as cognitive tools of the new media age. In L.T.W. Hin & R. Subramaniam (Eds.), *Handbook of research on new media literacy at the K-12 level: Issues and challenges* (pp. 353–371). Hershey, PA: IGI Global.
- Hsu, Y.-C., Ching, Y.-H., & Grabowski, B. (in press). Web 2.0 applications and practices for learning through collaboration. In M. Spector, D. Merrill, J. Elen, & M. J. Bishop (Eds.), *Handbook of research on educational communications and technology* (4<sup>th</sup> ed.). Springer Academics.
- Johnson, L., Levine, A., Smith, R., & Stone, S. (2010). *The 2010 Horizon Report*. Austin, TX: The New Media Consortium.
- Johnson, L., Smith, R., Willis, H., Levine, A., & Haywood, K. (2011). *The 2011 Horizon Re-*

port. Austin, TX: The New Media Consortium.

Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. New York, NY: Cambridge University Press.

Lai, C. -Y., & Wu, C. -C. (2006). Using handhelds in a Jigsaw cooperative learning environment. *Journal of Computer Assisted Learning*, 22(4), 284–297.

Liu, T. Y., Tan, T. H., & Chu, Y. L. (2009). Outdoor natural science learning with an RFID-supported immersive ubiquitous learning environment. *Educational Technology & Society*, 12(4), 161–175.

Motiwalla, L. F. (2007). Mobile learning: A framework and evaluation. *Computers & Education*, 49, 581–596.

O'Reilly, T. (2005). What is Web 2.0: Design patterns and business models for the next generation of software. Retrieved from <http://www.oreillynet.com/lpt/a/6228>.

Pauschenwein, J., & Sfiri, A. (2010). Adult learner's motivation for the use of micro-blogging during online training courses. *International Journal of Engineering and Technology*, 5(1), 22–25.

Strauss, A., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Newbury Park, CA: Sage.

Tudge, J., & Scrimsher, S. (2003). Lev S. Vygotsky on education: A cultural-historical, interpersonal, and individual approach to development. In B. J. Zimmerman & D. H. Schunk (Eds.), *Educational psychology: A century of contributions* (pp. 207–228). Mahwah, NJ: Lawrence Erlbaum Associates.

Waller, M. (2010). Using Twitter in the primary classroom. *English Four to Eleven*, 39, 14–16.

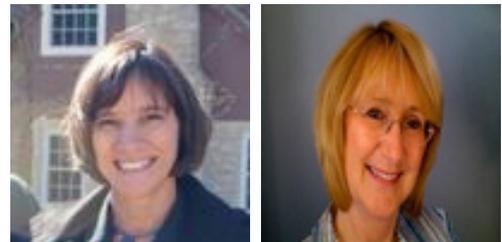
Wright, N. (2010). Twittering in teacher education: Reflecting on practicum experiences. *Open Learning*, 25(3), 259–265.

Zurita, G., & Nussbaum, M. (2004). Computer supported collaborative learning using handheld computers. *Computers & Education*, 42, 289–314.

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# Sense of Community in Graduate Online Education: Contribution of Learner to Learner Interaction



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## Abstract

Distance learning technologies offer a multitude of ways to build interaction into online courses to support learning. Based on social constructivism theory, this study explored which types of interaction are most predictive of students' sense of community in online graduate courses at a regional comprehensive university. Surveys were used to measure sense of community and the frequency and importance of nine learner–learner interactions.

Interactions that were most predictive of sense of community were introductions, collaborative group projects, sharing personal experiences, entire class discussions, and exchanging resources. The interaction that offered the highest payoff to instructors was exchanging resources. The article discusses implications for online course design.

**Keywords:** Distance learning; online learning; distance education; building online community; exchanging resources; collaborative group projects

## Introduction

Distance learning that makes use of online technology continues to outpace the growth of traditional education delivery, and enrolment in online courses has expanded steadily over the past two decades in higher education institutions in the United States (Parry, 2010). Availability of educational delivery options on the Internet does not, however, automatically create quality learning experiences. Instructors must use technologies and delivery formats strategically to create satisfying and high-quality educational experiences for students.

Research supports the development of community in online learning as an important factor for maximizing student satisfaction with the experience (Liu, Magjuka, Bonk, & Lee, 2007; Ouzts, 2006; Rovai, 2002a). As instructors consider the many course design options suggested in the literature for creating positive student experiences, they need information beyond expert opinion to guide them. They require empirical evidence to guide their design choices as they build into courses the interactive experiences that can create a community of learners.

The purpose of this study is to examine which types of learner to learner interactions contribute most to the development of students' sense of community (SoC) in online learning. SoC is defined in the literature as "a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together" (McMillan & Chavis, p. 9).

Interaction is defined as "reciprocal events that require at least two objects and two actions" (Wagner, 1994, p. 8). Learner-learner interaction (L-L) is communication between students, in pairs or groups, with or without an instructor present (Moore, 1989). Other types of interaction such as learner-instructor, learner-content (Moore, 1989), and learner-interface (Hillman, Willis, & Gunawardena, 1994) are not within the scope of this study.

An environment that facilitates the development of a classroom community can be established in an online environment (Rovai, 2001). Purposeful design of courses that minimize student isolation can enhance community in online learning (McInnerney & Roberts, 2004; Yang & Liu, 2008).

There is evidence to support the importance of building community for social reinforcement (Conrad, 2005; Gallagher-LePak, Reilly, & Killion, 2009; Moller, 1998), information exchange (Moller, 1998), and student outcomes (Anderson & Elloumi, 2004; Drouin, 2008; Exter, Korkmaz, Harlin, & Bichelmeyer, 2009; Liu et al., 2007; Shea, 2006; Shea, Li, & Pickett, 2006; Wegerif, 1998).

Studies support the assertion that SoC can be developed in an online learning environment through use of interaction (O'Hara, 2008; Palloff & Pratt, 1999; Stepich & Ertmer, 2003). A high level of interaction also appears to be positively correlated with students' SoC (Baab, 2004; Lear, 2007). When examined quantitatively, interaction explains a significant proportion of the variance in community developed by online students (Dawson, 2006).

## Theoretical Framework

Social constructivism (Vygotsky, 1978) views learning as a process in which a learner works to construct new meaning through active involvement. The role of the educator is to establish an environment in which active participation between and among learners and the instructor can occur. The learner must engage in interaction with his or her instructor, peers, and content, and attempt to make sense of what he or she encounters.

This learner-centered approach holds that, for many students, the one-way flow of information from expert to student that makes up some forms of distance education is less than ideal to foster learning. Most students benefit from the multifaceted mediation of an instructor and interaction with peers as they attempt to make sense of complex content (Wallace, 2003).

In an online education setting, this flow of information is constrained by technology, equipment, and the asynchronous nature of much distance learning. Information flow, therefore, requires attention and planning beyond that needed in a face-to-face educational setting. The instructor must select technologies and tasks that will allow for the communication and exchange of information needed to support construction of knowledge over a distance (Vrasidas, 2000).

Learner–learner, learner–instructor, and learner–content interaction function in an interdependent manner, with each potentially contributing to and benefiting from the others as students and instructor participate in an online learning environment. This interwoven relationship has been described from the perspective of a community of inquiry (CoI) model (Garrison, Anderson, & Archer, 2000). This framework for effective online learning presents three elements: cognitive presence, social presence, and teaching presence.

Cognitive presence describes the ability of a community of learners to construct meaning through sustained communication. It develops as students collaborate to explore, construct, resolve, and confirm their understanding of content (Garrison, 2007).

Social presence is “the ability of participants in a community of inquiry to project themselves socially and emotionally, as ‘real’ people (i.e., their full personality), through the medium of communication being used” (Garrison et al., 2000, p. 94). A strong social presence supports cognitive presence. Interactions between learners contribute to the socio-emotional connections that make up social presence. Open communication and group cohesion forged through collaboration are hallmarks of social presence (Garrison, 2007).

Both cognitive and social presence are closely tied to and supported by teaching presence, described as “instructors’ ability to project themselves in online courses” (Swan, 2003, p. 24). Teaching presence is comprised of design and organization, facilitation of discourse, and direct instruction (Garrison, 2007). Ke (2010) suggests that teaching presence can serve as both a catalyst to the development of a community of inquiry and a shaper of student cognitive and social performance.

Though cognitive, social, and teaching presence represent psychological constructs that can arise from interaction, Swan (2003) draws parallels between the three presences and interaction types. She suggests that learner–content interaction might be most closely equated with cognitive presence, learner–learner interaction with social presence, and learner–instructor interaction with teaching presence.

While several interaction types can contribute to sense of community, the scope of this pa-

per is restricted to learner–learner interaction. This focus allows a full consideration of numerous learner–learner interactions while limiting the time commitment for participants and therefore maximizing the survey return rate.

## Review of the Literature

Interactions between a learner and other learners have been viewed for some time as important to building SoC (Wolcott, 1996). A review of the literature resulted in the identification of nine learner–learner interactions that had two or more research studies supporting their contribution to sense of community. This section discusses the empirical support for these interactions.

### Opportunities to Learn about Other Students

The ability to share background information and learn about fellow students is frequently cited in the literature as critical to building SoC in online learning. Establishing commonalities with classmates served to promote online community in Gallagher-Lepak et al.'s (2009) study. In focus groups, these undergraduate students frequently discussed identification of shared interests and experiences as pivotal in developing community.

In a qualitative study, Stallings and Koellner-Clark (2003) examined a number of teaching strategies in a collaborative online classroom using multiple technology formats. They discussed the importance of highly interactive introductions that allow students to get to know one another, and recommended the use of initial face-to-face sessions to facilitate this interaction. Stepich and Ertmer (2003) found that having students post individual introductions helped them to find areas of common interest and background, which facilitated a sense of belonging.

In a mixed methods study, Liu et al. (2007) found a moderately positive relationship between SoC and social presence in online graduate students. One of the four survey items measuring social presence dealt with familiarity with other students.

### Ice-Breaker Activities

Interactive game-like activities can lead students to develop a greater sense of community. McElrath and McDowell (2008) called for online instructors to involve students in interactive, game-like activities, which lead students to engage with and accept one another, and to be accepted by the online community. Stepich and Ertmer (2003) specifically asked students to make connections online with two or more classmates and engage in conversation about common interests, and reported that this activity helped students build a mutual sense of belonging to the learning community.

### Online Discussions

Online students develop community, construct understanding, and question and clarify content through discussion with other learners. In a constructivist approach, the instructor takes part in these discussions but acts as a facilitator who guides the dialogue, rather than

controlling it (Nicholson, 2005). Online learning benefits from a balance of whole-class and smaller group discussions (Rovai, 2004). Whole-class discussions are commonly suggested as a means for developing a sense of classroom community (Liu et al., 2007). Adult students in a graduate course indicated that asynchronous class discussions were a significant contributor to their SoC (Rovai, 2001). These students felt they benefited from their classmates' experiences through threaded discussions. The presence of both novice and veteran students in one class can add an element of interdependence among students as they work to construct meaning together (Brown, 2001; Stepich & Ertmer, 2003). Ke (2010) reports that students may approach enforced online discussions in a superficial manner, and that without appropriate guidance, asynchronous discussions can become grade-driven rather than an exercise in group knowledge construction.

In addition to asynchronous discussion, Rogers, Graham, Rasmussen, Campbell, and Ure (2003) found in their case study involving 19 students in a distance course that both students and instructors valued two-way synchronous discussion for the purpose of asking and answering questions.

### Small Group Discussions

Wolcott (1996) promotes learner-centered activities in online learning, including small group interactions such as discussions, study groups, and cross-group communication to decrease student isolation and enhance communication. Students involved in group discussions are able to work toward academic goals together and to assist and support one another as they become active learners (Aviv, 2000).

### Social Communication

Nicholson (2005) posits that the social component of a typical face-to-face class needs to be purposefully facilitated in online learning in order to support the social growth of students. Rovai (2001) conducted a case study during a five-week graduate level online course. He found that students made use of a social communication forum to pursue connections with one another and to share information and support.

In Liu et al.'s (2007) mixed methods study, interview results indicated that opportunities for social interaction boosted interpersonal relationships and supported positive communications among students. Graduate students in an online instructional design course used an asynchronous social discussion area to express support and encouragement for other students, to discuss similarities, and to share the challenges they faced (Stepich & Ertmer, 2003). While some students in Conrad's (2002) interpretive study of adult learners expressed appreciation for the opportunity to communicate socially, others said there was a limit to how much time they were willing to spend reading social comments. Participants in Gallagher-Lepak et al.'s (2009) study reported that informal conversations helped them build friendships and camaraderie. They found this communication outside the boundaries of the academic requirements to be important for establishing social bonds and facilitating learning.

## Collaborative Group Projects

The importance of collaborative group work in building an online sense of community is well established in the literature. Small group activities are positively correlated with SoC (Rovai, 2002a). Rovai (2004) states that small group activities in online learning are consistent with constructivist approaches, and can lead to the development of trust and positive relationships between classmates. Studies have found that students believed collaborative work in their online courses was instrumental in the development of community (Baturay & Bay, 2010; Conrad, 2005; Gallagher-Lepak et al., 2009). Small group work also has shown a positive effect on learning (Cameron, Morgan, Williams, & Kostelecky, 2009; Liu et al., 2007).

The idea that an online class community develops primarily among members of small groups rather than across the entire class also has been supported in the literature. Liu et al. (2007) reported that students in an online MBA program formed a community with their group members, but felt little community across the entire class due to limited whole-class interaction.

## Peer Teaching

In an educational technology online course, graduate students expressed the importance of gaining experience in group leadership (Wegerif, 1998). The authors postulated that the students desired increased control over their online learning experience, and benefited from the opportunity to contribute to its structure.

First-year undergraduates reported satisfaction with peer teaching activities in a blended learning environment that included face-to-face sessions and online activities (Leese, 2009). Students in small groups worked collaboratively to prepare presentations that they would peer-teach during the next session. Students developed increased confidence in working together, presenting to peers, and resolving conflicts.

## Exchanging Resources

Stepich and Ertmer (2003) suggest that when students share resources with one another, they become more responsible for their own learning, their participation is enhanced, and relationships among members of the learning community are strengthened. Participants in Stepich and Ertmer's study found that the instructor was not the only source of information, and they built a shared knowledge base by contributing information sources, techniques, and tools.

In discussing the development of online community in interviews over one year, participating graduate students indicated the importance of providing one another with multiple resources (Haythornthwaite, Kazmer, Robins, & Shoemaker, 2006). These participants pointed out that the flow of information was reciprocal and helped to build strong ties.

## Sharing Personal Experiences

Graduate level nursing students in an online course reported that they had the opportunity

to learn from one another's clinical experiences (Ali, Hodson-Carlton, & Ryan, 2004). They indicated that they valued other students' contributions in this area.

Baab's (2004) mixed methods study found that students receiving the highest classroom community scores reported they shared personal experiences in the context of class discussions and assignments. Participants reported that sharing their experiences enhanced their learning and helped them make connections to the outside world.

### Face-to-Face Meetings

Haythornthwaite et al. (2006) suggest that face-to-face meetings are important for establishing initial bonding between distance students. Participants in Haythornthwaite et al.'s (2006) qualitative study indicated that while some considered live meetings to be an inconvenience, others found the initial face-to-face experience was an important way to unite, establish a shared history, and develop bonds of friendship. Stallings and Koellner-Clark (2003) found that using face-to-face meeting time for highly interactive activities resulted in a stronger classroom community. Students reported that the connections forged in the face-to-face sessions were important for the success of the online components of the class.

Conrad (2005) indicated that graduate students in her qualitative study reported that face-to-face meetings facilitated communication in online components of the course. Students who took advantage of an in-person site visit for a course in Conrad's (2002) study indicated it allowed them to create a special bond with one another. They reported feeling little kinship with the online students who had not attended the site visit.

### Research Question

The research question that guided the study was, What learner-learner interactions in online learning are most predictive of sense of community?

## Method

For this non-experimental, quantitative, descriptive study, all faculty teaching online graduate courses at a South Central U.S. regional comprehensive university during the fall 2011 semester were contacted for permission to survey their students. No limitations were placed with regard to college or department, and faculty members represented a broad range of disciplines. Of the 150 instructors who were contacted, 110 gave permission to survey their students.

Student participants were over the age of 18 years and were taking graduate web courses during the fall 2011 semester. The researchers obtained permission to survey 1,589 unique students representing 2,189 enrollments.

Surveys were sent to 1,589 students through electronic mail. Students received a description of the study, a consent form, a brief demographic questionnaire, the Classroom Community Scale (Rovai, 2002b), and the interaction survey. After two follow-up reminders were sent, students completed 381 usable surveys, giving a response rate of 24%. There

were 28 partially completed surveys that had insufficient data for inclusion in the analyses. Descriptive statistics were calculated to describe the study sample and population (see Table 1).

Table 1

*Descriptive Statistics for the Sample and Population*

	Mean	SD	%	Min.	Max.	N
Sample						381
Gender						375
Male			21.6%			81
Female			78.4%			294
Age	32.77	9.01		19	63	376
Number of previous online classes	7.58	6.64		0	35	377
Number of face-to-face classes	.57	2.03		0	16	365
Employment status						378
Full-time			61.2%			233
Part time			24.9%			95
Not employed			13.1%			50
Population						3266
Gender						3257
Male			26.1%			850
Female			73.9%			2407
Age	32.22	8.36		20	71	3266

## Measures

The Classroom Community Scale (Rovai, 2002b) was used to measure sense of community. This scale is comprised of 20 Likert items that reflect connectedness and perceived learning in the course. Face validity and construct validity have been established (Rovai, 2002b; Rovai & Baker, 2005). Internal consistency of the scale items of the CCS have been established in the literature for a number of university undergraduate and graduate populations. Cronbach's  $\alpha$  is consistently excellent for this instrument, ranging from .88 to .93 for the overall scale, which indicates evidence of strong reliability (Dawson, 2006; Ritter, Polnick, Fink, & Oescher, 2010; Rovai & Baker, 2005; Shea et al., 2006).

Interaction type and frequency were measured using a 32-item Qualtrics survey developed by the author (see Appendix). An extensive review of the literature resulted in the identification of nine learner-learner interactions (Table 2) which had two or more research stud-

ies supporting their contribution to sense of community. Survey questions were formulated to elicit the students' perceptions of the frequency with which each interaction occurred in their course and the importance of that interaction to their development of community. Face and content validity were determined through a review by a panel of experts and a focus group. A reliability analysis was conducted to determine the internal consistency of the interaction scale.

## Variables

SoC (the dependent variable) was operationalized as the overall score on the Classroom Community Scale (Rovai, 2002b). Frequency of learner–learner interaction was operationalized as participant scores on a 5-point Likert scale, with responses ranging from 1 (*Never*) to 5 (*Very Often*). Importance was measured by participant scores on a 5-point Likert scale, with responses ranging from 1 (*Not at All*) to 5 (*Very*).

## Data Analysis

Data were entered into SPSS 19.0, with CCS total score as the dependent variable, and interaction items as the independent variables. CCS items that were negatively worded were reverse coded so that a high score indicated a high level of community for all items. The CCS total score was calculated by summing CCS responses for each participant. Multicollinearity diagnostics were conducted, followed by a stepwise linear regression analysis to investigate the amount of variance explained by each type of learner to learner interaction. Demographic variables were entered into the regression model to determine their effect on SoC.

Results were also interpreted using a matrix that identified high and low frequency and high and low perceived importance of learner–learner interactions. This matrix analysis was used to identify the interaction types that could be categorized as low-frequency, high importance items, and high-frequency, high importance items. The items so categorized are expected to be the interaction types that offer the most yield to an instructor in online course design.

Chi-square analyses were conducted to examine the relationship between the frequency and importance of each interaction. Due to the low count in some cells, responses were recoded to collapse data into three categories for each variable. Frequency data from the chi-square analysis were then used to calculate ratios, which placed each type of interaction in a quadrant of an importance-to-frequency scatterplot, with each interaction representing either low importance/low frequency, low importance/high frequency, high importance/low frequency, or high importance/high frequency (see Figure 1). Low values were defined as less than 1.0, and high values were defined as more than or equal to 1.0.

## Results

A reliability analysis revealed a Cronbach's  $\alpha$  of .928 for the CCS scale, indicating the scale has excellent reliability. The Cronbach's  $\alpha$  was .880 for the learner–learner frequency items, and .909 for the learner–learner importance items of the interaction scale, indicat-

ing good reliability.

## Research Question Results

All interaction items were fairly to moderately correlated, with higher CCS total scores (see Table 2). Multicollinearity diagnostics indicated no cause for concern, using a cutoff value of 5. No VIF values for independent or demographic variables exceeded 1.882.

Table 2

### *Correlations Between CCS Total Score and L–L Frequency Items*

	CCS total	1	2	3	4	5	6	7	8
LLF_1 Introductions	.595*								
LLF_2 Ice-breakers	.495*	.651*							
LLF_3 Online discussions (entire class)	.408*	.373*	.314*						
LLF_4 Online discussions (small group)	.404*	.465*	.382*	.375*					
LLF_5 Social communication	.446*	.531*	.537*	.363*	.410*				
LLF_6 Collaborative group projects	.481*	.474*	.524*	.307*	.388*	.500*			
LLF_7 Peer teaching	.400*	.463*	.504*	.280*	.411*	.435*	.583*		
LLF_8 Exchanging resources	.522*	.582*	.472*	.392*	.446*	.454*	.481*	.530*	
LLF_9 Contributing personal experiences	.520*	.590*	.433*	.410*	.460*	.356*	.412*	.428*	.582*

*Note.* \* indicates  $p < .05$ . LLF = learner–learner frequency

For learner–learner interactions, the regression model was significant ( $F = 62.861, p < .05$ ), with the adjusted  $R^2$  value indicating that 46% of the variance is explained by the five predictor variables: introductions, collaborative group projects, contributing personal experiences, entire class online discussions, and exchanging resources (see Table 3). The other items were excluded from the model due to their nonsignificant impact on SoC.

Table 3

*Significance of the Regression Model and Regression Coefficients for Significant Predictors in Learner–Learner Model*

Model	<i>F</i>	<i>R</i> <sup>2</sup>	Adjusted <i>R</i> <sup>2</sup>	$\beta$	<i>t</i>	Sig.
L–L model	62.861	0.46	0.453			
LLF_1: Introductions				0.307	5.847	0.000
LLF_6: Collaborative group project				0.177	3.882	0.000
LLF_9: Contribute personal experiences				0.138	2.655	0.008
LLF_3: Entire class online discussions				0.133	3.080	0.002
LLF_8: Exchange resources				0.126	2.396	0.017

*Note.* LLF = learner–learner frequency

The authors conducted an analysis of the demographic variables, number of previous online courses, number of face-to-face class meetings, gender, age, and employment status—with SoC as the dependent variable. The variable number of previous online courses, as a measure of experience with online learning, had a significant effect on SoC ( $p < .05$ ). Employment status, number of face-to-face class meetings, gender, and age had a nonsignificant effect on SoC. It should be noted that the sample was homogeneous with regard to the number of reported face-to-face meetings. Fully 80% of participants (295 out of 365) reported no face-to-face meetings in their class. Such a homogeneous sample may be insufficient for this demographic variable to be a valid representation of the effect of face-to-face meetings.

Chi-square results showed that for each type of learner–learner interaction, frequency was significantly related to importance. For all types of interaction, the relationship was positive in direction. As shown in Figure 1, Item 8 (exchanging resources) was a high importance/low frequency item for learner–learner interaction. This item occurred infrequently among students, but was considered highly important for building SoC. Items 4 (small group discussions), 9 (contributing personal experiences), and 3 (entire class discussions) were high importance/high frequency items.

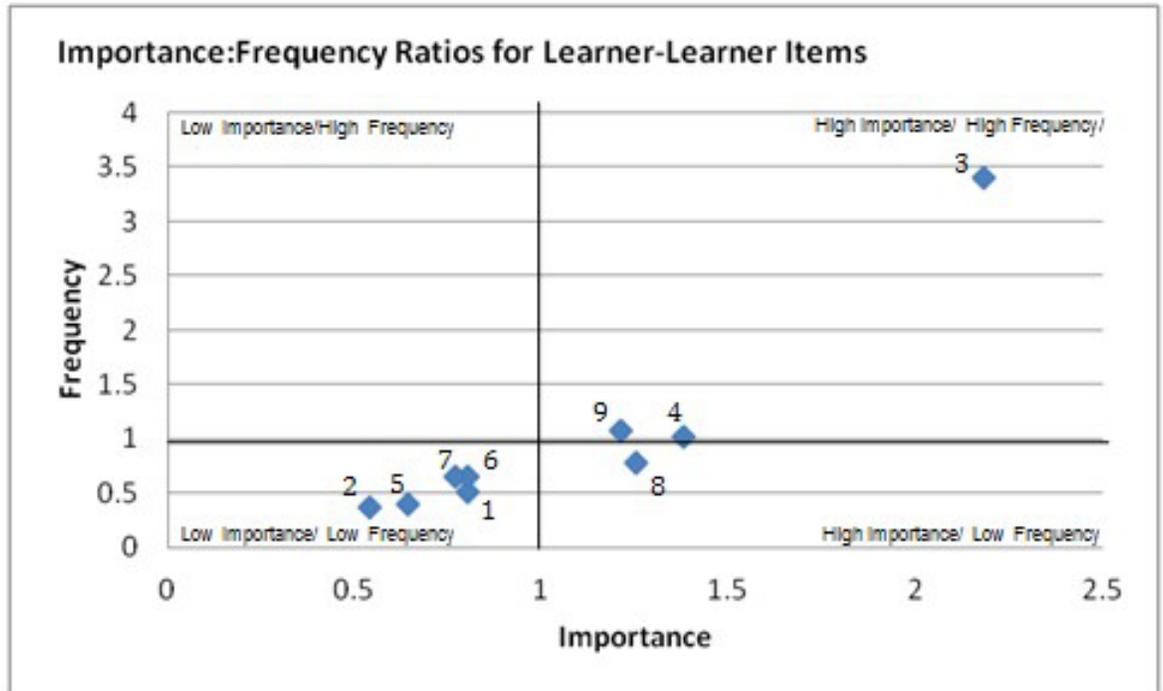


Figure 1. Importance-to-frequency ratios for learner–learner interaction items. In this matrix analysis, four quadrants of low and high frequency and low and high importance are delineated by horizontal and vertical black lines along the 1.0 value markers. Points are ratios of frequency to importance for each interaction item: (1) introductions, (2) ice-breakers, (3) entire class discussions, (4) small group discussions, (5) social communication, (6) collaborative group projects, (7) peer teaching, (8) exchanging resources, and (9) contributing personal experiences.

## Discussion

The results of this study revealed that interactions are correlated with sense of community and identified a number of interactions that contribute to SoC.

### Learner–Learner Interactions

Interactions between learners which emerged as contributing the most to sense of community, in decreasing order of contribution, were (a) introductions, (b) collaborative group projects, (c) contributing personal experiences, (d) entire class online discussions, and (e) exchanging resources.

These results support the findings of Gallagher-Lepak et al. (2009) and Stepich and Ertmer (2003) that indicate that introductions at the beginning of an online class allow students to establish commonalities upon which they can build throughout the semester. Introductions may allow students to get off to an early start with online community-building, which allows them more time to develop a rich sense of community.

The emergence of collaborative group projects as a contributor to SoC supports the exten-

sive literature that promotes getting students to work as a team on shared projects to bring them together (Baturay & Bay, 2010; Conrad, 2005; Gallagher-Lepak et al., 2009; Rovai, 2002a; Rovai, 2004).

Contributing personal experiences explained almost 14% of the variance in SoC. While this type of interaction has not received much attention in the online learning literature (Ali et al., 2004; Wolcott, 1996; and Baab, 2004), it is apparent that giving students an opportunity to express how class content relates to their life or professional experience is important in terms of building connectedness and shared learning.

Academic discussion involving the entire class is an intuitive contributor to community. It is in this venue that students question content, seek clarification, build their understanding, and begin to form an impression of their peers in the class (Liu et al., 2007; Rovai, 2001).

Finally, exchanging resources emerged as a contributor to SoC, supporting Stepich and Ertmer (2003) and Haythornthwaite et al. (2006), who promoted the idea that when students share information, documents, and techniques, they become more responsible for their own learning and find they have resources beyond the instructor upon whom they can depend. They learn they have peers with whom they can enter into a mutually supportive relationship as they struggle to learn and manage their responsibilities.

## Contribution of Demographic Characteristics to Interaction

Only the number of previous online courses emerged as a contributor to SoC. This result supports the work of Brown (2001), Gallagher-Lepak et al. (2009), Lear (2007), and Rovai (2001). Veteran distance learners, no longer burdened with the double task of learning content and technology, tend to interact and work toward building community with their peers more than novice online learners. They have learned through experience that community can be established in an online course, and they begin early in the semester to make the contacts that will support their connectedness and learning. Age, gender, and employment status did not appear to contribute to SoC in this sample, as would be expected based on findings in studies by Exter et al. (2009) and Gallagher-Lepak et al. (2009).

## High-Yield Interactions

The interaction type that offers the highest payoff for the instructor in terms of balance between effort and benefit is exchanging resources; it offered the highest yield. While four of the nine learner–learner interaction types were viewed by students as highly important in building SoC (small group discussions, entire class discussions, the opportunity to contribute personal experiences, and exchanging resources with peers), only exchanging resources was viewed as highly important, even though it did not occur often. This indicates that this interaction appears to offer the greatest yield to the busy instructor who seeks to facilitate community.

## Limitations

The limitations of this study were related to the nature of data collection and generalizability. The surveys measured the perception of human interaction events, and there is always room for interpretation of social constructs of this kind. Due to the timing of the data col-

lection, which took place three weeks before the end of the semester, some interaction types might have been underrepresented.

The sample was drawn from one university, so results may not apply to students at other universities. The low response rate to the survey further limits generalizability.

## Future Research

Future studies on this topic could collect data at the end of the semester to provide better representation of interaction types that tend to occur late in the semester. An investigation of the interactions valued by students in cohort models would be of interest. Sampling across multiple universities would provide a more diverse population. Further research might also use qualitative methods to shed light on the reasons why some interaction types emerge as low or high importance.

## Implications

An instructor who wants to facilitate SoC can build learner–learner interaction into online courses in a number of ways. He or she should provide an opportunity for students to get to know one another early in the semester. This enables students to establish commonalities and connections that increase their comfort with contacting one another. These contacts encourage further interaction throughout the semester, leading to an increased SoC.

Use of collaborative group projects can encourage students to work as a team. The instructor, however, must provide sufficient direction and support to improve the chances that this teamwork will be positive and contribute to sense of community.

It is important to allow students the opportunity to contribute brief stories about their own experiences during either asynchronous threaded discussions or synchronous discussions. Not all students will want or need to contribute, but the chance to connect personally to academic content will benefit those who do participate.

Requiring class discussions on academic topics encourages students to negotiate meaning and to learn from one another. These discussions can be synchronous or asynchronous.

The instructor should talk with students early in the semester about the benefits of sharing learning resources with one another. Experienced online learners can support novice learners, and students with expertise or skills in a particular professional area can contribute to the success of peers in the class by sharing resources such as documents, research articles, formatting tips, or links to topics of academic interest. Social media can be suggested as a means of sharing resources.

The message of this study is that in this age of dazzling technology, there is still no substitute for interaction, and there must be opportunities for students to interact in multiple ways with their peers in an online environment. An instructor who desires to retain students through facilitating SoC has many tools for building interaction into an online

course. Through purposeful use of activities that incorporate interaction among students, the instructor can create a welcoming and accepting online course in which students have a sense of belonging and trust.

## References

- Ali, N. S., Hodson-Carlton, K., & Ryan, M. (2004). Students' perceptions of online learning: Implications for teaching. *Nurse Educator*, 29, 111–115.
- Anderson, T., & Elloumi, F. (2004). *Theory and practice of online learning*. Edmonton, AB: Athabasca University Press. Retrieved from [http://cde.athabascau.ca/online\\_book/](http://cde.athabascau.ca/online_book/)
- Aviv, R. (2000). Educational performance of ALN via content analysis. *Journal of Asynchronous Learning Networks*, 4(2), 53–72.
- Baab, L. (2004). Effect of selected factors on students' sense of classroom community in distance learning courses (Doctoral dissertation). Available from Proquest Dissertations and Theses database. (UMI No. 3150346)
- Baturay, M. H., & Bay, O. F. (2010). The effects of problem-based learning on the classroom community perceptions and achievement of web-based education students. *Computers & Education*, 55(1), 43–52.
- Brown, R. E. (2001). The process of community-building in distance learning classes. *Journal of Asynchronous Learning Networks*, 5(2), 18–35.
- Cameron, B. A., Morgan, K., Williams, K. C., & Kostecky, K. L. (2009). Group projects: Student perceptions of the relationship between social tasks and a sense of community in online group work. *American Journal of Distance Education*, 23(1), 20–33.
- Conrad, D. (2002). Deep in the hearts of learners: Insights into the nature of online community. *Journal of Distance Education*, 17(1), 1–19.
- Conrad, D. (2005). Building and maintaining community in cohort-based online learning. *Journal of Distance Education*, 20(1), 1–20.
- Dawson, S. (2006). A study of the relationship between student communication interaction and sense of community. *Internet and Higher Education*, 9, 153–162.
- Drouin, M. A. (2008). The relationship between students' perceived sense of community and satisfaction, achievement, and retention in an online course. *Quarterly Review of Distance Education*, 9, 267–284.
- Exter, M. E., Korkmaz, N., Harlin, N. M., & Bichelmeyer, B. A. (2009). Sense of community within a fully online program: Perspectives of graduate students. *Quarterly Review of Distance Education*, 10, 177–194.
- Gallagher-Lepak, S., Reilly, J., & Killion, C. (2009). Nursing student perceptions of com-

- munity in online learning. *Contemporary Nurse: A Journal for the Australian Nursing Profession*, 32, 133–146.
- Garrison, D. R. (2007). Online community of inquiry review: Social, cognitive, and teaching presence issues. *Journal of Asynchronous Learning Networks*, 11(1), 61–72.
- Garrison, D. R., Anderson, T., & Archer, W. (2000). Critical inquiry in a text-based environment. *Computer Conferencing in Higher Education*, 2, 87–105.
- Haythornthwaite, C., Kazmer, M. M., Robins, J., & Shoemaker, S. (2006). Community development among distance learners: Temporal and technological dimensions. *Journal of Computer-Mediated Communication*, 6(1). doi:10.1111/j.1083-6101.2000.tb00114.x
- Hillman, D. C. A., Willis, D. J., & Gunawardena, C. N. (1994). Learner–interface interaction in distance education: An extension of contemporary models and strategies for practitioners. *American Journal of Distance Education*, 8(2), 30–42.
- Ke, F. (2010). Examining online teaching, cognitive, and social presence for adult students. *Computers & Education*, 55, 808–820.
- Lear, J. (2007). *Interactive class design and sense of community in online distance education classes: A mixed methods research study* (Doctoral dissertation). Available from Proquest Dissertations and Theses database. (UMI No. 3321124)
- Leese, M. (2009). Out of class—out of mind? The use of a virtual learning environment to encourage student engagement in out-of-class activities. *British Journal of Educational Technology*, 40, 70–77. doi:10.1111/j.1467-8535.2008.00822.x
- Liu, X., Magjuka, R. J., Bonk, C. J., & Lee, S. (2007). Does sense of community matter? *Quarterly Review of Distance Education*, 8, 9–24.
- McElrath, E., & McDowell, K. (2008). Pedagogical strategies for building community in graduate level distance education courses. *MERLOT Journal of Online Learning and Teaching*, 4, 117–127.
- McInnerney, J. M., & Roberts, T. S. (2004). Online learning: Social interaction and the creation of a sense of community. *Educational Technology & Society*, 7(3), 73–81.
- McMillan, D. W., & Chavis, D. M. (1986). Sense of community: A definition and theory. *Journal of Community Psychology, Psychological Sense of Community, I: Theory and Concepts*, 14(1), 6–23.
- Moller, L. (1998). Designing communities of learners for asynchronous distance education. *Educational Technology Research and Development*, 46(4), 115–122.
- Moore, M. (1989). Editorial: Three types of interaction. *American Journal of Distance Ed-*

ucation, 3(2), 1–7.

- Nicholson, S. (2005). A framework for technology selection in a web-based distance education environment: Supporting community-building through richer interaction opportunities. *Journal of Education for Library and Information Science*, 46, 217.
- O'Hara, L. J. (2008). *An investigation of the formation of learning community in web-based distance education* (Doctoral dissertation). Retrieved from <http://challenger.library.pitt.edu/ETD/available/etd-04302008-092522/>
- Ouzts, K. (2006). Sense of community in online courses. *Quarterly Review of Distance Education*, 7, 285–296.
- Palloff, R., & Pratt, K. (1999). *Building learning communities in cyberspace*. San Francisco, CA: Jossey-Bass.
- Parry, M. (2010, January 26). Wired campus: Colleges see 17 percent increase in online enrollment [Web log post]. Retrieved from <http://chronicle.com/blogs/wiredcampus/colleges-see-17-percent-increase-in-online-enrollment/20820>
- Ritter, C., Polnick, B., Fink, R., & Oescher, J. (2010). Classroom learning communities in educational leadership: A comparison study of three delivery options. *Internet and Higher Education*, 13, 96–100.
- Rogers, P. C., Graham, C. R., Rasmussen, R., Campbell, J. O., & Ure, D. M. (2003). Case 2: Blending face-to-face and distance learners in a synchronous class: Instructor and learner experiences. *Quarterly Review of Distance Education*, 4, 245–51.
- Rovai, A. (2001). Building classroom community at a distance: A case study. *Educational Technology Research and Development*, 49(4), 33–48.
- Rovai, A. P. (2002a). Building sense of community at a distance. *International Review of Research in Open and Distance Learning*, 3(1). Retrieved from <http://www.irrodl.org/index.php/irrodl/article/view/79>
- Rovai, A. P. (2002b). Development of an instrument to measure classroom community. *Internet and Higher Education*, 5, 197–211. (ERIC Document Reproduction Service No. EJ663068)
- Rovai, A. P. (2004). A constructivist approach to online college learning. *Internet and Higher Education*, 7, 79–93.
- Rovai, A. P., & Baker, J. D. (2005). Gender differences in online learning. *Quarterly Review of Distance Education*, 6, 31–44.
- Shea, P. (2006). A study of students' sense of learning community in online environments. *Journal of Asynchronous Learning Networks*, 10(1), 35–44.

- Shea, P., Li, C. S., & Pickett, A. (2006). A study of teaching presence and student sense of learning community in fully online and web-enhanced college courses. *Internet and Higher Education*, 9, 175–190.
- Stallings, L. L., & Koellner-Clark, K. (2003). Re-creating graduate teacher education classrooms: Multiple technology formats and collaborating instructors. *Journal of Technology and Teacher Education*, 11, 501–514.
- Stepich, D. A., & Ertmer, P. A. (2003). Building community as a critical element of online course design. *Educational Technology*, 43(5), 33–43.
- Swan, K. (2003). Learning effectiveness: What the research tells us. In J. Bourne & J. C. Moore (Eds.), *Elements of quality online education, practice and direction* (pp. 13–45). Needham, MA: Sloan Center for Online Education.
- Vrasidas, C. (2000). Constructivism versus objectivism: Implications for interaction, course design, and evaluation in distance education. *International Journal of Educational Telecommunications*, 6, 339–362.
- Vrasidas, C., & McIsaac, M. S. (1999). Factors influencing interaction in an online course. *American Journal of Distance Education*, 13, 22–36.
- Vygotsky, L. S. (1978). *Mind in society*. Cambridge, MA: MIT Press.
- Wagner, E. D. (1994). In support of a functional definition of interaction. *American Journal of Distance Education*, 8, 6–29.
- Wallace, R. M. (2003). Online learning in higher education: A review of research on interactions among teachers and students. *Education, Communication and Information*, 3, 241.
- Wegerif, R. (1998, March). The social dimension of asynchronous learning networks. *The Journal of Asynchronous Learning Networks*, 2(1). Sloan Consortium. Retrieved from <http://sloanconsortium.org/jaln/v2n1/social-dimension-asynchronous-learning-networks>
- Wolcott, L. L. (1996). Distant, but not distanced: A learner-centered approach to distance education. *TechTrends*, 41(5), 23–27.
- Yang, H. H., & Liu, Y. (2008). Building a sense of community for text-based computer-mediated communication courses. *Journal of Educational Technology Systems*, 36, 393–413.

## Appendix: Interaction Scale

**Directions:** The following statements relate to interactions **between you and other students** in your class. Please indicate how often these interactions happened in this class.

**FREQUENCY:** In this class, how often did you:

have the opportunity to get to know classmates by sharing information about yourselves?	Never	Rarely	Occasionally	Often	Very often
participate in an activity (such as a game or ice breaker) to get to know classmates?	Never	Rarely	Occasionally	Often	Very often
take part in online discussions with the entire class?	Never	Rarely	Occasionally	Often	Very often
take part in small group discussions online?	Never	Rarely	Occasionally	Often	Very often
communicate with other students about non-academic topics (such as an open discussion board, Water Cooler forum, etc.)?	Never	Rarely	Occasionally	Often	Very often
work with a group of classmates on a collaborative project?	Never	Rarely	Occasionally	Often	Very often
take part in peer teaching (such as giving presentations or leading discussions)?	Never	Rarely	Occasionally	Often	Very often
exchange resources (such as links or documents) and information with classmates?	Never	Rarely	Occasionally	Often	Very often
contribute personal experiences as they relate to course content?	Never	Rarely	Occasionally	Often	Very often

**IMPORTANCE:** How important were each of these interactions in contributing to your sense of community in this course?

have the opportunity to get to know classmates by sharing information about yourselves?	Not at all	Slightly	Fairly	Quite	Very
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participate in an activity (such as a game or ice breaker) to get to know classmates?	Not at all	Slightly	Fairly	Quite	Very
take part in online discussions with the entire class?	Not at all	Slightly	Fairly	Quite	Very
take part in small group discussions online?	Not at all	Slightly	Fairly	Quite	Very
communicate with other students about non-academic topics (such as an open discussion board, Water Cooler forum, etc.)?	Not at all	Slightly	Fairly	Quite	Very
work with a group of classmates on a collaborative project?	Not at all	Slightly	Fairly	Quite	Very
take part in peer teaching (such as giving presentations or leading discussions)?	Not at all	Slightly	Fairly	Quite	Very
exchange resources (such as links or documents) and information with classmates?	Not at all	Slightly	Fairly	Quite	Very
contribute personal experiences as they relate to course content?	Not at all	Slightly	Fairly	Quite	Very

### Demographic Questions

Approximately how many online courses have you taken prior to this course?

Pull-down menu (0–50)

Did your entire class meet in person in a physical classroom at least once during the semester?

Yes    No

What is your employment status?

Employed full time    Employed part time    Not currently employed

What is your gender?

Male    Female

What is your age?

Pull-down menu (18–99)

Athabasca University 



## Student Access to and Skills in Using Technology in an Open and Distance Learning Context



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### Abstract

Amidst the different challenges facing higher education, and particularly distance education (DE) and open distance learning (ODL), access to information and communication technology (ICT) and students' abilities to use ICTs are highly contested issues in the South African higher education landscape. While there are various opinions about the scope and definition of the digital divide, increasing empirical evidence questions the uncritical use of the notion of the digital divide in South African and international higher education discourses.

In the context of the University of South Africa (Unisa) as a mega ODL institution, students' access to technology and their functional competence are some of the critical issues to consider as Unisa prepares our graduates for an increasingly digital and networked world.

This paper discusses a descriptive study that investigated students' access to technology and their capabilities in using technology, within the broader discourse of the "digital divide." Results support literature that challenges a simplistic understanding of the notion of the "digital divide" and reveal that the nature of access is varied.

**Keywords:** Access; digital divide; ICT; open distance learning (ODL); skills; University of South Africa (Unisa)

### Introduction

The reality and function of the notion of a digital divide in South Africa as a developing country should be understood against the backdrop of the manifold challenges facing higher education in general (e.g., Barnett, 2000a, 2000b), and particularly higher education in

South Africa (e.g., Czerniewicz, 2004; Moja & Hayward, 2000; Kraak, 2000; Teferra & Altbach, 2004; Waghid, 2002). It is therefore important to situate the debate on the content, scope, and impact of the digital divide in the context of major societal changes in order to address various forms of exclusion prior to the first democratic elections in 1994 based on racial, language, and gender criteria.

Against the broader backdrop of the various challenges facing higher education, and distance education provision in particular, of particular importance is the issue (however contested) of digital inclusion or exclusion. Though ICT use tends to accentuate social disparities between rich and poor (Butcher, 2011, p. 30), access to technologies is part of the “new geographies of power and access that have reconfigured the world” (Czerniewicz, 2004, p. 146). The digital divide is, however, a broad and multilayered phenomenon—with more than just a technological emphasis (Castells, 2009; Czerniewicz & Brown, 2005; Czerniewicz & Brown, 2010; Furuholt & Kristiansen, 2007). The need for a more nuanced and critical understanding of the digital divide is therefore of the utmost importance (e.g., Brown & Czerniewicz, 2010; Castells, 2009; De Haan, 2004; van Dijk & Hacker, 2003). The issue of the digital divide is furthermore a “political battlefield” (van Dijk & Hacker, 2003, p. 321) embedded in broader discourses, such as the employability of graduates (Chetty, 2012). In the general context of critiques regarding our use of notions such as the digital divide, and technology as the most important driver of educational change (see e.g., Friesen, 2008), our research contributes to illustrating that the digital divide is not a simplistic separation between “haves” and “have-nots.”

In this paper, we explore variations in the digital divide in the specific context of the University of South Africa. We will first provide an annotated overview of a number of authors who “debunk” (Brown & Czerniewicz, 2010), “demystify” (Warschauer, 2002), “reconfigure” (Czerniewicz & Brown, 2010), and “rethink” (Underwood, 2007) or “reconceptualize” (Warschauer, 2002) the notion and function of the digital divide as germane to higher education discourses. The purpose of this article is not to validate or test a particular theoretical model for understanding the digital divide, but we agree, in broad terms, with De Haan’s (2004) “multifaceted dynamic model.” After providing an overview of the discourse on the digital divide, we provide and analyze findings of a questionnaire that aimed to determine, amongst other things, the nature of students’ access to technology and their skills in the specific context of the University of South Africa (Unisa), one of the mega universities of the world.

The significance of this research lies in its contribution to the discourse pertaining to the institutionalization of e-learning in mega open universities (e.g., Panda & Mishra, 2007).

## Research Context

Unisa is one of the mega universities of the world, with over 350,000 students in 2011. In that year, 282,248 students registered on the Unisa learning management system, myUnisa. As Unisa endeavours to optimize the affordances of technology to increase the effective-

ness of teaching and learning, it was essential to determine to what extent the notion of the “digital divide” was an accurate reflection of the Unisa student profile.

Prior to 2011, no dedicated Unisa-wide research had been done to determine the level of access and technological capabilities of students. Given Unisa’s strategic commitment to increase online provision, this kind of information was becoming important for the institution to reflect on. Clearly, if students do not have access to ICTs, then many of the perceived advantages of using ICTs for education do not translate into reality. Positively, though, the past year has seen an encouraging number of students who have access to myUnisa (282,248, as of October 27<sup>th</sup>, 2011). However, this does not necessarily translate into full and sustained Internet access.

Within this context, a survey was undertaken to investigate student access to and effective utilization of ICTs. Its broad aim was to provide data that could be used by management to inform decisions within the context of providing effective learner support. In contributing to knowledge about our students, the research also challenged common assumptions about students’ access to technology.

## Literature Review

The relationship between advances in technology and their impact on education is well-researched and documented (e.g., Baldwin, 1998; Herrington & Oliver, 2003). It is dangerous to assume, however, that technology is the only factor shaping our epistemologies and praxis (see e.g., Friesen, 2008). Advances in technology are also often used as the main differentiator in our conceptual understanding of the various generations of learners in general and in distance education (DE) in particular (Heydenrych & Prinsloo, 2010, p. 5).

Different theoretical models explore and map various aspects of digital inclusion (e.g., Livingstone & Helsper, 2007) and exclusion (e.g., Castells, 2009). While researchers can opt to investigate either inclusion or exclusion, we agree with Castells (2009) that inclusion often implies exclusion and that the two concepts are interdependent and linked. Though a number of authors specifically focus on digital inclusion (e.g., Livingstone & Helsper, 2007; Madon, Reinhard, Roode, & Walsham, 2009) in the light of the digital divide’s prominence in discourses on e-learning in ODL institutions, we attempt to provide an overview of the rather simplistic and un-nuanced definition of the digital divide and implicitly address inclusion as part of that divide. In doing so, we acknowledge that technology and access to technology are shaped by broader global economic, political, and cultural factors. While not everyone is included in this networked society, “*everyone is affected* [emphasis added] by the processes that take place in the global networks that constitute the social structure” (Castells, 2009, p. 25; also see Czerniewicz, 2004, p. 149).

The idea of the digital divide as part of the “double logic of inclusion and exclusion” (Castells, 2009, p. 25) is pertinent in education, and Castells warns that the one common fundamental form of exercising power is to exclude (Castells, 2009, p. 50). Underwood (2007, p. 213) indicates that the term “digital divide” became the lingua franca in the 1990s, referring

in general to those who have access to technologies and those with no access. Underwood (2007, p. 214) further states that the notion of the digital divide “is a simplistic model even at an economic level and that it is better to think of information-based economic nodes, within and across regions and within and across countries.” A more nuanced understanding of the digital divide must also take into account the “second-level digital divide,” capturing the skills dimension of access to technology (Underwood, 2007, p. 214), the different levels of digital literacy, and the divides resulting from the use of English as the language of communication in many online educational platforms (Underwood 2007, p. 215). Warschauer (2002, no page numbers) states that the “notion of the binary divide between the haves and the have-nots is thus inaccurate and can even be patronising as it fails to value the social resources that diverse groups bring to the table.”

De Haan (2004, pp. 67–68) points out three problems with current understandings of the digital divide, namely (1) concerns about the simple criterion of access; (2) the fact that the term “digital divide” is mainly descriptive and fails to take into account the factors that *cause* the divide; and (3) the lack of concern regarding the consequences of differential access. He therefore proposes a multidimensional model in contrast to the general binary understanding of access versus no access. De Haan (2004, p. 71) states that most of the discussion on the digital divide privileges the possession and use of a PC and Internet connection, while “less attention has been paid to digital skills or competence and to motivation.” (For a critical discussion of the impact of digital skills and motivation, see De Haan, 2004, pp. 75–76.) See De Haan (2004, p. 70) and van Dijk (2006) for a discussion on different understandings and models mapping the richness of the notion of “access.”

Warschauer (2002, no page numbers) summarises criticisms against the notion of the digital divide as follows:

There is not one type of ICT access, but many; the meaning and value of access varies in particular social contexts; access exists in gradations, rather than in bipolar opposition; [...] and acquisition of ICT access is a matter not only of education, but also of power.

## Methodology: Considerations and Approach

This research aimed to evaluate the current status of students’ access to and use of various ICTs, as well as their skills and capabilities in using such technologies. It collected baseline information both from students registered on the institutional learning management system (myUnisa) and from those not registered. The research provides a more multilayered understanding and thicker description of access than just the differentiation between access and non-access (e.g., Burbules & Callister, 2000; Czerniewicz & Brown, 2005). Underpinning this two-pronged aim was the acknowledgement that while access to technology is crucial given Unisa’s ODL context and strategic commitment to online learning in the very near future, having the ability to use technology is equally important. The statistical analysis is descriptive, using the data to interpret the range of access and capabilities of Unisa students.

The key research questions were as follows:

- What is the extent of ICT access among Unisa students?
- What are the technological capabilities of Unisa students?

## Research Approach

The sampling approach was non-random and purposive (as described by Johnson & Christensen, 2008; Teddlie & Yu, 2007; and Tongco, 2007). The strength of purposive sampling lies in its intentional bias (Tongco, 2007, p. 154). The study aimed to profile two groups of students, namely, students who had already joined myUnisa or used mobile applications to access and use the technology provided by Unisa and those who had not joined myUnisa and did not use technology to interact with the university. Consequently, the methodology was two-fold: a) an online survey option for students who had a myUnisa account and accessed the technology provided by Unisa, and b) a paper-based option for those students without a myUnisa account or with an unused account. The intention was to gain insight into why these students have not joined myUnisa (either via mobile or PC), what the current extent of their technology capabilities are, and what future possibilities might be.

It was recognized that a proportion of students were not accessing technology, with low usage of myUnisa and other technology provided by Unisa being the primary indicators. To avoid bias, it was deemed important to accommodate these students via a paper-based questionnaire. Those regional offices with a low number of students using myUnisa relative to the total number of Unisa students were selected.

The regions across the country in which myUnisa usage was low and which were therefore targeted for the paper-based survey were Polokwane, Giyani, Durban, Richardsbay, Wild-coast, Newcastle, and Mthatha.

## Response Rate

This survey had a positive response rate. Students participated online with great enthusiasm, resulting in over 22,000 fully completed questionnaires. Participation in the regions was slightly lower than expected, however, with just below 500 completed paper-based questionnaires. This number is still statistically valid and resulted in sound analyses. Of the 282,248 online students, 22,216 completed the survey, resulting in an 8% response rate. Of the 1,400 students sent the paper-based survey, 474 completed it, resulting in a 33% response rate. To improve response rates, an SMS was also sent to students' mobile phones.

## Validity and Reliability

The validity and reliability of both the research design and survey instrument were reflected upon. External validity, which looks at the representativeness and generalisability of the survey results (Cooper & Schindler, 1998), was largely addressed by the sampling process. Internal validity, on the other hand, focused on the survey instrument and what it was supposed to measure (Cooper & Schindler, 1998) given the research objectives. Internal reliability focused on the extent to which the research design and data obtained allowed

the researchers to draw conclusions about underlying relationships within the data. This was also supported by the theoretical underpinnings of the study. Three specific forms of validity were deemed important for the study, namely, face validity, content validity, and criterion validity. Face validity, while being mostly subjective in nature, was addressed by means of a peer review of the survey instrument amongst both institutional research and ICT staff members. During this process, content validity was also established, confirming the appropriateness of the survey instrument in providing adequate coverage of the investigative questions that guided the study. Criterion validity was confirmed during the exploratory analysis of the data in terms of how the results correlated with other similar research findings within the institution, notably a student profile survey and a student satisfaction survey, which focused in part on students' ICT usage.

## Findings and Analyses: Two Themes

It is pertinent to understand how the analyses were approached and the findings represented. It was acknowledged that within the online group of students who use myUnisa, there could be students who have regular access to a computer and/or the Internet and those who do not have this access. Similarly, within the paper-based group, there could be students with or without access. The results support this and challenge the common assumption that all students using myUnisa have regular Internet access, and that students who are not using myUnisa do not have this access.

While many interesting findings emerged from the survey regarding the current status of student access and use of various ICTs, only the key aspects are discussed. This paper particularly aims to unpack the themes of *access* to technology in an ODL environment, as well as the *ability* to use this technology.

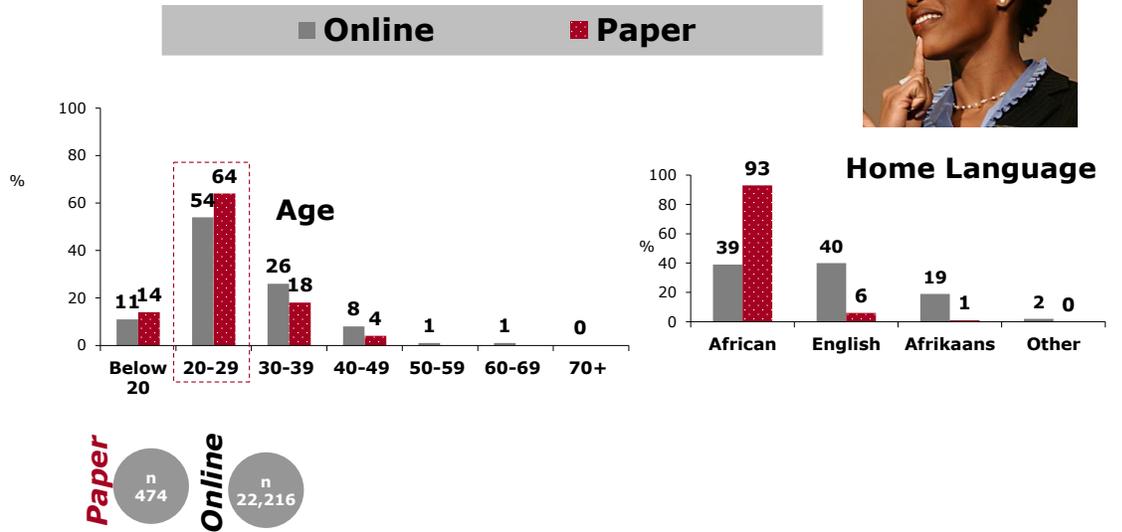
In order to gain insight into the survey data, a profiling of the survey respondents was undertaken. The data profiling process in this research project was intended to confirm whether the Unisa student body was adequately represented.

### Profile of Respondents

Figure 1 below reflects the profile of online and paper-based respondents.

# Profile: Respondents

Profiling according to methodology



Profiling according to methodology

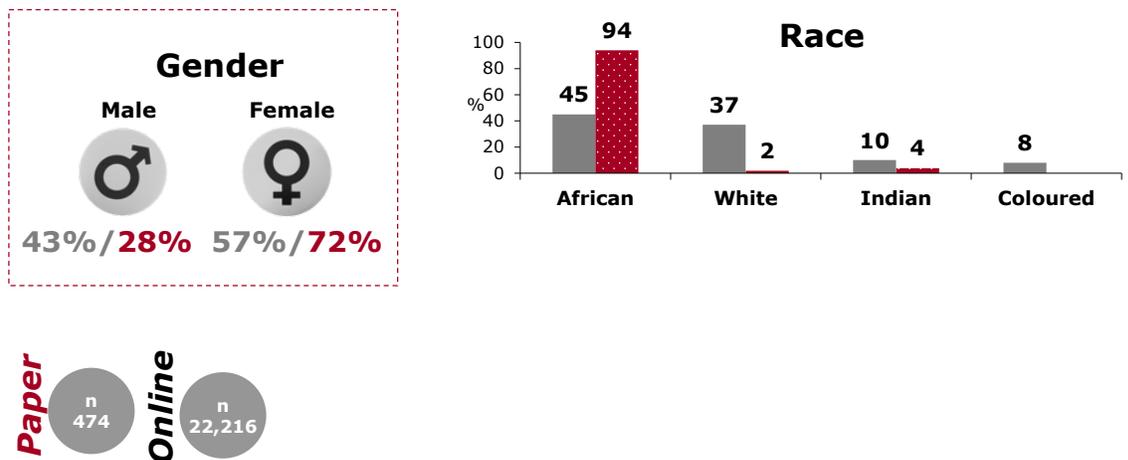


Figure 1. Profiling survey respondents by age, home language, gender, and race.

The majority of participating students were African females, for both the online and the paper-based options, clearly representative of Unisa’s current student body, with the majority of students falling into the above-mentioned categories.

Students who participated in the online survey were typically African or white females between 20 and 29 who spoke either English or an African language. Students who participated in the paper-based survey were typically African females between 20 and 29 who spoke an African language. The insight gained from profiling according to the methodology clearly indicated that the participants were representative of Unisa students as most

of Unisa's students are young African females who reside in Gauteng, Western Cape, and KwaZulu Natal.

## Access

In this section, the theme of access is explored. Upon asking students if they have regular access to a computer (e.g., PC, Mac, laptop, netbook) even if it was not personally owned, all students who participated online indicated that they have regular access to a computer for study purposes (100%). By comparison, only 52% of paper-based respondents have access to computers, far less than online respondents.

Further analysis was undertaken to establish the location of access. The analysis revealed that students who have access to a computer mostly access it from home (61%). Online respondents also make use of work facilities on a frequent basis (53%), with just 9% using Internet cafés and 7% using the Unisa computer laboratory. Paper-based respondents also access a computer mostly from home (39%). However, unlike online respondents, they make use of Internet café facilities more often (29%) than work facilities (17%). Furthermore, 12% of paper-based respondents access a computer at someone else's home, compared to just 2% of online respondents.

### Access to the Internet.

Students were asked to indicate if they have regular access to the Internet from a computer even if it is not their own. Results show that 91% of students who participated online do have regular access to the Internet, clearly an overwhelming majority. However, this means that 9% of online students do not have regular access to the Internet. By comparison, 46% of students who completed the paper-based survey have access, with 54% not having access. Clearly, both groups of students *have access* and *do not have access* to the Internet, debunking the assumption that all online students have regular access to the Internet and that all paper-based respondents are likely not to have regular access. This confirms research by, amongst others, Brown and Czerniewicz (2010), Czerniewicz (2004), Underwood (2007), and Warschauer (2002), supporting the idea that access to computers and the Internet is a multidimensional phenomenon and that the strict binary of "haves" and "have-nots" is not a usable construct.

Online students who have access to the Internet mostly access it from home (57%) and work (51%). However, paper-based respondents in most cases make use of Internet café facilities (34%), followed by the Unisa computer laboratories (25%). Research results also reveal that students who have home computers are more likely to have Internet access.

It is not surprising that the mobile phone is reducing reliance on public Internet facilities. Evident from the findings is that the mobile phone is the third most popular option for online students to access the Internet (11%), followed by Internet café facilities (10%). Furthermore, 10% of paper-based respondents make use of their mobile device to connect to the Internet, indicating that respondents from both sampling methods increasingly use their mobile phone to access the Internet.

ADSL is the most used type of Internet access among the online group (39%), followed by 3G (35%), a company local area network (32%), and mobile devices (16%). Within the paper-based group, however, 51% indicated that they do not know the type of Internet access they are using. This lack of knowledge could be attributed to a lack of ownership of a personal computer. It is less likely that these students would know the type of Internet access used as we have discovered that they are mainly accessing the Internet from Internet café facilities. However, 18% do access via ADSL connections, followed by 3G (14%) and mobile devices (12%).

### **Reasons for no access to the Internet.**

For the online respondents, a lack of access to a personal computer (28%) and affordability (25%) were the main reasons they did not have Internet access, followed by not being allowed to access the Internet at work (11%).

Paper-based respondents provided similar reasons for not being able to access the Internet. A lack of access to a personal computer (25%) and affordability (22%) were the two main reasons students do not have Internet access, followed by not being able to afford the travel costs to a facility with a connection (11%). Clearly, from the results for both online and paper-based students, the lack of a personal computer and affordability are the main obstacles to access to the Internet.

### **Access to the Internet using a mobile phone.**

It is evident that the vast majority (82%) of online respondents own a mobile device that is capable of accessing the Internet. By comparison, only 55% of paper-based respondents own a mobile device that is capable of accessing the Internet, which nevertheless is still a large number of students making use of mobile connectivity.

Respondents were further probed on the frequency with which they use the Internet. A total of 62% of online respondents make use of their mobile phone to access the Internet daily (41%) or weekly (21%). By comparison, 43% of paper-based respondents never use their mobile phone to access the Internet. However, a total of 44% of paper-based respondents do make frequent use of their mobile phone to access the Internet—this occurs daily (21%), several times a week (14%), or weekly (9%).

It is important to note that affordability might inhibit efforts to leverage the use of mobile technology for study purposes. While students might access the Internet via their mobile phones for personal activities and be willing to pay for this usage, they may be less likely to be able to afford to use mobile technology for study or learning activities.

### **Profiling according to access.**

As analysis progressed, it became more pertinent to explore whether the profiles of students *with access* or *without access* to the Internet were similar or different (see Figure 2).

The profiles of both groups of students were representative of our current student population. The profile of respondents by various demographics therefore closely mirrors the distribution of these demographics in the student population at Unisa. This is reflected in Figure 2 below.

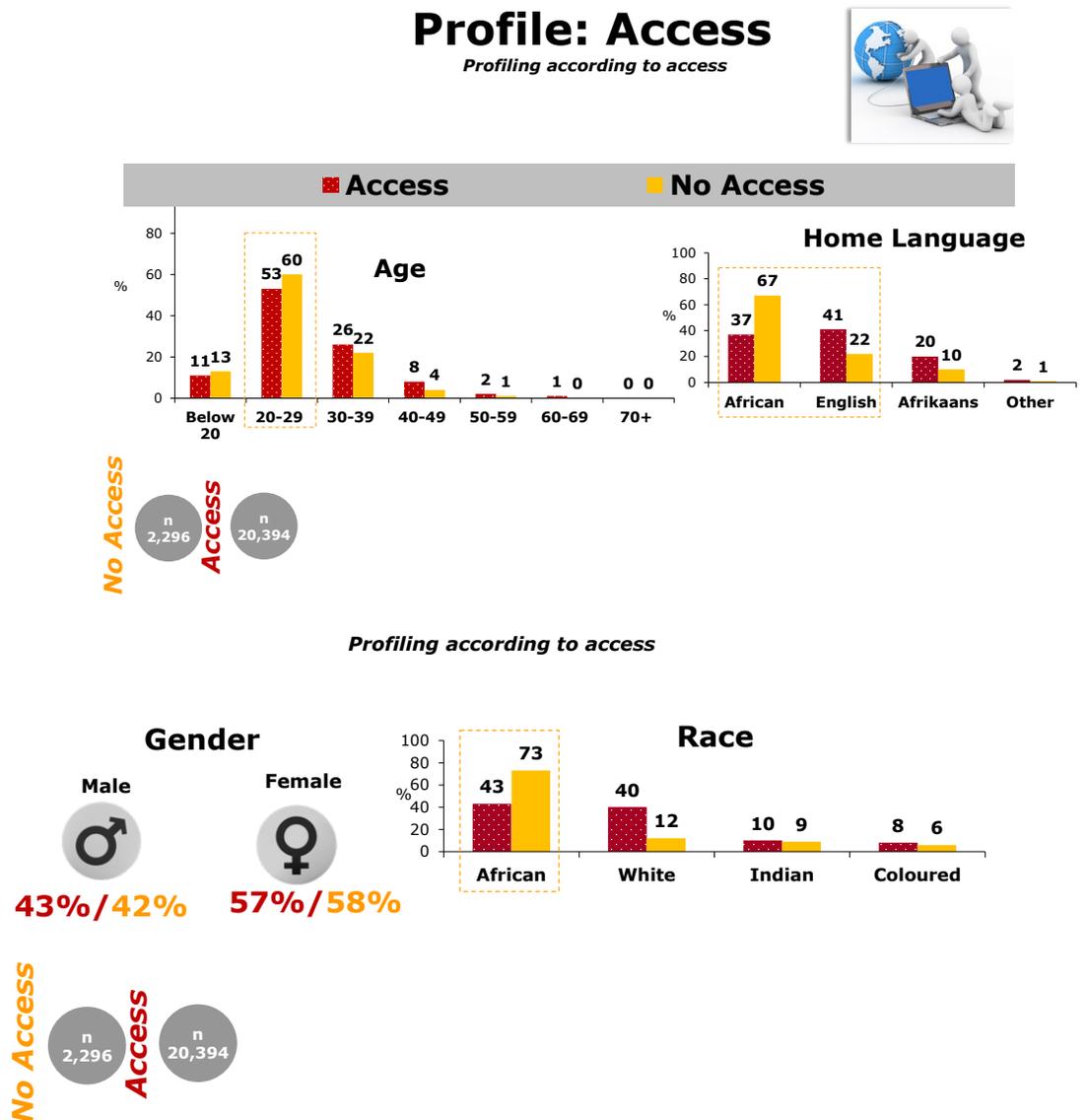


Figure 2. Profile according to access: demographics.

Figure 2 reveals that students who *have* access are typically African and white females between 20 and 29 who speak either English or an African language. The finding that the *access* group includes African students questions assumptions about access being racially skewed. Students who have regular access to the Internet also have a very similar profile to those students who participated online.

Students who *do not have* access are typically African females (73%) between 20 and 29 who speak an African language. Clearly, *non-access* is as prevalent among female African

students as is *access*. The profile of students with *no access* to the Internet mirrors the profile of students who participated via the paper-based option.

It was also important to determine the regional distribution of *access* and *no access*, and this is reflected in Figure 3.

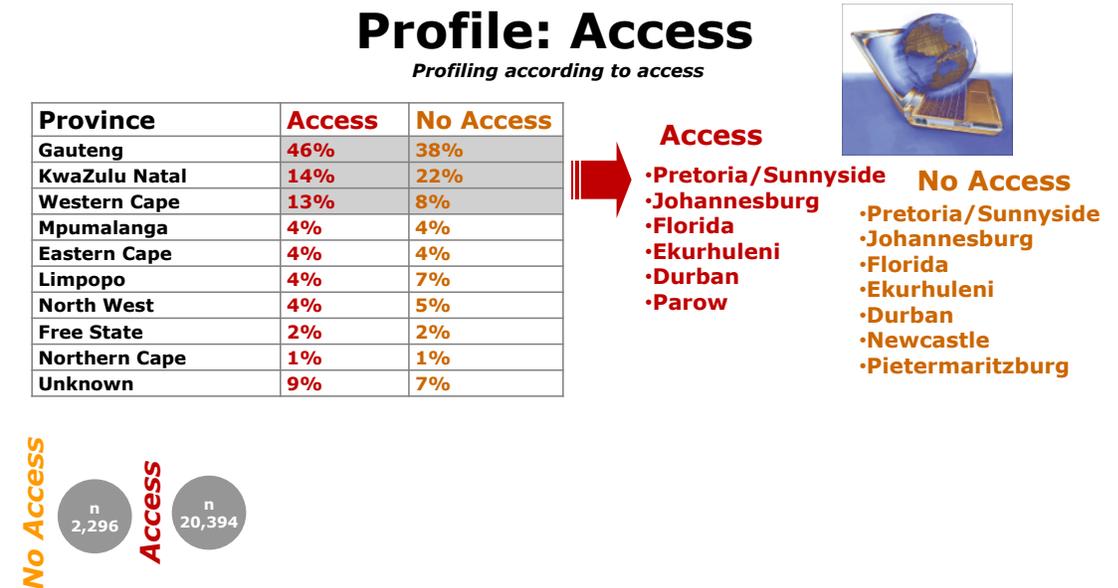


Figure 3. Profile according to access: regional distribution.

Figure 3 reveals that students who *have regular access* reside in main metropolitan areas in Gauteng, KwaZulu Natal, and the Western Cape, amongst others. Similarly, students who *do not have regular access* reside in main metropolitan areas in Gauteng and KwaZulu Natal.

Even in main metropolitan areas such as Pretoria and Benoni, some students struggle with Internet access, mainly because of the cost involved and not necessarily because of infrastructure or location. This again challenges a common assumption that non-access is more prevalent in rural areas.

### Capabilities

Following access, the second key theme explored was the ability of students to use technology. This was based on students' self-reports of their abilities.

**Downloading ability.**

*Can you download and play videos and audio files on the computer you use regularly?*

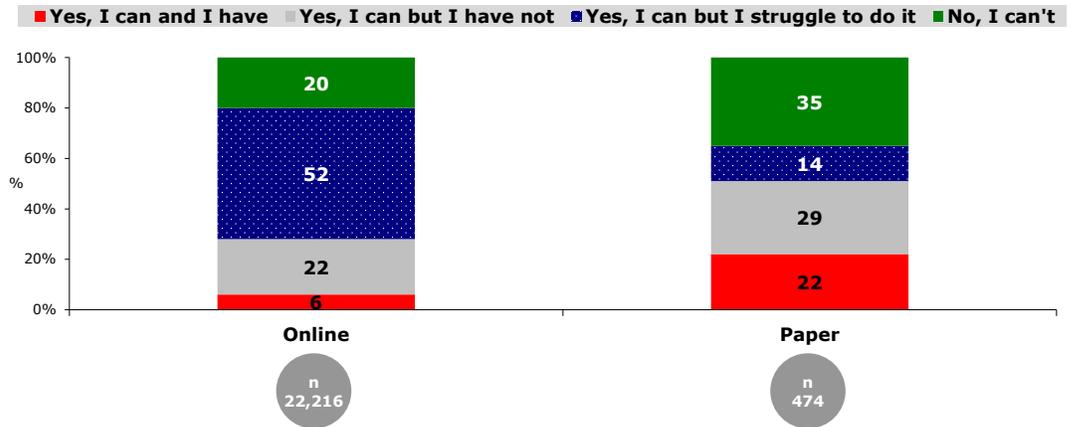


Figure 4. Downloading ability (student self-report).

Figure 4 reveals that online respondents mostly indicated that they do download and play video and audio files but struggle to do so (52%). However, more paper-based respondents (35%) than online respondents (20%) indicated that they cannot do it at all. The reasons for this are illustrated in Figure 5.

*If you can't or struggle to do so, why is this?*

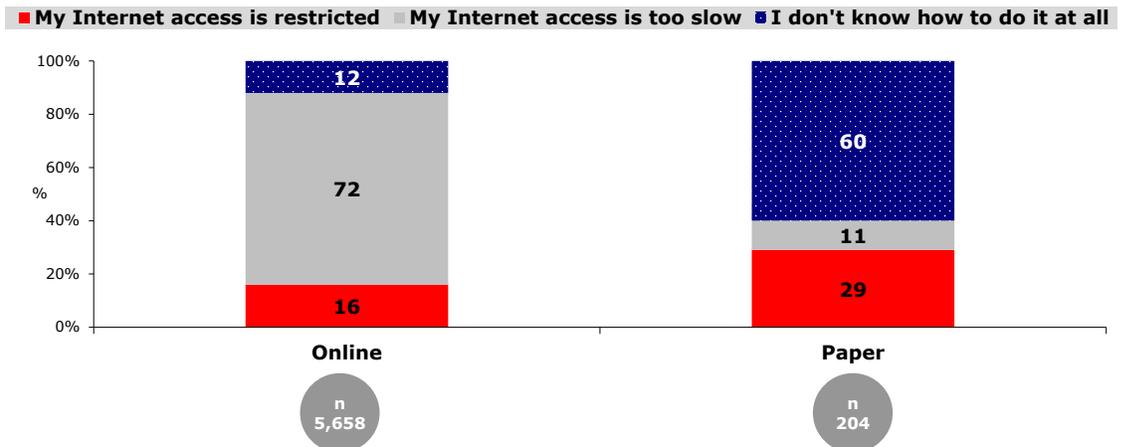


Figure 5. Reasons for “I can, but struggle” and “I can’t” (student self-report).

Figure 5 reveals that among the online group, students struggle mainly due to slow Internet access. On the contrary, the paper-based group indicated that they struggle due to a lack of know-how. The latter reflects a lack of technical ability among this group of students, which will need to be addressed in view of Unisa’s strategic intent to move toward an online-only policy by 2015. Some online courses at Unisa will make use of videos and audio files and could potentially inhibit student success if students are not ICT proficient. Furthermore, students who do not own a personal computer or cannot afford access to the Internet, as

results revealed, are likely to be slower to build and develop the necessary skills required.

**Ability to use software packages, platforms, and IT resources.**

Students were asked to indicate their ability to use specific software packages via a self-rating scale. According to Seymour and Fourie (2004), an attempt is being made to create ICT-literate individuals, with an effort being made into providing access to ICTs. Regardless, researchers have argued that access alone does not lead to effective usage and that factors such as sociocultural and behavioural issues need to be addressed as well. Clearly, students who participated online are very comfortable with e-mail (93%), Internet browsers (92%), and Internet search engine platforms (93%). As expected, these students can also navigate through the myUnisa site very well (91%). Of concern is the low rating with regard to the Unisa online library (45%), as students clearly struggle to make use of this very important resource.

The pattern shifts for the paper-based respondents as they are less comfortable with Internet search engine platforms (48%) and e-mail (43%). These students struggle to use the myUnisa site, with just 38% rating their ability as very good. They also scored themselves very low (25%) in terms of their ability to use the Unisa online library.

**Ability to use a range of other resources from a mobile phone.**

Students’ ability to use a range of other resources from a mobile phone was also investigated and this is based on their self-reports. The responses for online students are reflected in Figure 6.

*Please rate your ability to use the following applications on/from your mobile device.*



Figure 6. Ability to use a range of other resources on/from a mobile device (student self-report).

It is clear that online students have the *ability* to make use of SMS and e-mail applications.

The responses for paper-based students are reflected in Figure 7.

**Please rate your ability to use the following applications on/from your mobile device.**



Resources	Top Box Score
Instant messages	Very Good- 22%
SMS	Very Good- 86%
E-mail	Very Good- 43%
Micro-blogs (Twitter)	Very Good- 18%
Social networking websites (Facebook)	Very Good- 47%
News, weather, sports	Very Good- 43%
Blogs	Very Good- 21%
Maps	Very Good- 20%
Banking, shopping	Very Good- 25%
Flickr, Picasa	Very Good- 20%
Download or stream music	Very Good- 28%
Download or watch videos	Very Good- 33%
Download or play games	Very Good- 26%
Listen to radio	Very Good- 67%

Figure 7. Ability to use applications on/from a mobile device (student self-report).

Figure 7 reveals that paper-based respondents have lower levels of proficiency in using e-mail, which could be due to lower levels of access among this group.

## Discussion

Although the notion of the digital divide has been deconstructed and debunked by a number of authors (e.g., Czerniewicz & Brown, 2005; Czerniewicz & Brown, 2010; Furuholt & Kristiansen, 2007), the issue of digital inclusion and exclusion continues to play an important role in the rhetoric of higher education (e.g., Friesen, 2008) and more specifically in distance education (e.g., Panda & Mishra, 2007).

Evident from this research, students who are active on myUnisa and who completed the survey online have regular access to ICTs for educational purposes (91%). Contrary to popular belief that students participating online have access to the Internet, 9% of these students indicated that they do not have *regular* access to ICTs. This finding supports the view that the notion of “haves” and “have-nots” as a “bipolar societal split” (Warschauer, 2002) has no empirical basis.

The research also found that students who are not active on myUnisa and who completed the paper-based survey have less access to ICTs for educational purposes (46%). Survey results indicated that the majority of online students access the Internet either from home

(57%) or work (51%). According to the results of the 2009 ICT survey, the majority of students accessed the Internet from work. Based on the 2011 results, there has clearly been a shift, with more students having private access to the Internet from home.

With regard to the Internet, access is only one aspect. Other factors, such as the quality of resources (modem/PC) and connectivity (bandwidth), should be considered. This finding confirms the importance of resources in the bigger picture of “access” as proposed by De Haan (2004, p. 70). As indicated by the profiling results, regardless of the region in which students are located, affordability is the main determinant of access to the Internet. Even in main metropolitan areas such as Pretoria and Benoni, some students struggle with Internet access, mainly because of the cost involved and not necessarily as a result of infrastructure or location. This fact will have to be considered within the context of broader student initiatives to improve success, retention, throughput, and graduation rates.

The use of mobile phones is reducing the importance of public Internet access facilities. This is evident by the finding that the mobile phone is the third most popular option for online students to access the Internet. The increasing reliance upon the mobile phone and applications that lend themselves to regular use during the course of a student’s studies indicates that the mobile phone is a key entry point for Internet adoption (e.g., Alexander, 2004; Mcconatha, Praul, & Lynch, 2008). Mobile phones are being increasingly used by both white and African students to access the Internet (Shapshak, 2012). The change that smartphones bring is computing power in the palm of students’ hands, resulting in Internet connectivity almost anywhere in South Africa. This will have a profound influence on how Unisa develops platforms in order for students to be able to use various student-facing systems, such as online registration, myUnisa, and the online library, to mention but a few. Results indicate that the majority of online students access the Internet either from home or work, and this could have implications for ICT service delivery and support functions provided by Unisa. Aspects that will need to be taken into account are the times of day or night that students are active online. According to results, students tend to access more often from home, which results in increased activity online during non-working hours.

Results further reveal that not all students are ICT proficient in the Unisa environment—this will pose a challenge for learning in an ODL environment. While increased reliance on ICTs in HE assumes that students are ICT literate, it also assumes that all learners have similar levels of ICT proficiency. In the Unisa environment, this is not true and can potentially lead to deepening ICT-literacy inequalities.

Students who participated online (majority African) have better levels of proficiency than students who completed the paper-based survey (majority African). Despite the increased use of ICTs in education and for entertainment purposes, many university students still lack the ICT literacy needed for the completion of university assignments (Seymour & Fourie, 2004). It is clear that access alone does not lead to effective usage, and the focus on enhancing student ICT proficiency remains a key objective in the ODL environment. Concerns remain that the use of ICTs in education will widen existing divisions along economic, social, cultural, and geographic lines. The introduction of ICTs in education, when done

without careful deliberation, can result in the further marginalization of those who are already underserved and/or disadvantaged (Brown & Czerniewicz, 2010). In the Unisa environment, continued interventions and support are required to decrease inequalities and optimise student access to and effective utilization of ICTs.

## Conclusion

Reflecting on exclusion and inclusion in a networked society, Castells (2009) wrote:

Even with growing access to the Internet and to wireless communication, abysmal inequality in broadband access and educational gaps in the ability to operate in a digital culture tend to reproduce and amplify class, ethnic, race, age, and gender structures of social domination between countries and within countries. (p. 57)

Though our research was done in the specific context of an ODL institution in a developing economy, it highlights and confirms that digital access is nuanced and that we should not only understand, irrespective of context, how digital access and skills amplify and perpetuate existing societal inequalities within and between countries. As the cumulative effects of globalization and information-flows on higher education become more apparent (Barnett, 2000b), the digital divide becomes not only a concept germane to developing world contexts, but one that increasingly shapes and impacts all societies where global and local trends and forces interact, displace, exclude, and include.

Among the many challenges facing higher education and ODL provision in developing world contexts, the questions raised by the continued prominence of the digital divide need to be taken seriously, but also reflected on critically. Constructs such as the digital divide can be used to sustain an unwillingness by faculty (Panda & Mishra, 2007) to accept that technology is shaping higher education and that the way we see and understand knowledge and knowledge creation and validation has changed forever (e.g., Barnett, 2000a, 2000b). On the other hand, we cannot negate the fact that we should understand the issue of access to technology in the wider societal context of exclusion and inclusion (Castells, 2009).

This research provides evidence that the construct of the digital divide as a “bipolar societal split” (Warschauer, 2002) has very little, if any, empirical basis in the context of Unisa. Access to technologies and the skills to use these technologies vary and refuse to fit neatly into a binary model of “haves” and “have-nots.” Authors such as Brown and Czerniewicz (2010), Czerniewicz and Brown (2005), De Haan (2004), van Dijk (2006), and Warschauer (2002) provide findings to support an understanding of access to technology as a multi-faceted, dynamic construct embedded in broader socioeconomic, political, environmental, and technological realities.

## References

- Alexander, B. (2004). Going nomadic: Mobile learning in higher education. *EDUCAUSE Review*, 39(5), 28–35. Retrieved from <http://www.educause.edu/ero/article/going-nomadic-mobile-learning-higher-education>
- Baldwin, R. G. (1998). Technology's impact on faculty's life and work. *New Directions for Teaching and Learning*, 76, 7–21. Retrieved from <http://onlinelibrary.wiley.com/doi/10.1002/tl.7601/pdf>
- Barnett, R. (2000a). Thinking the university, again. *Educational Philosophy and Theory*, 32(3), 319–326.
- Barnett, R. (2000b). University knowledge in an age of supercomplexity. *Higher Education*, 40, 409–422.
- Brown, C., & Czerniewicz, L. (2010). Debunking the “digital native”: Beyond digital apartheid, towards digital democracy. *Journal of Computer Assisted Learning*, 26, 357–369.
- Burbules, N. C., & Callister, T. A. (2000). *Watch IT: The risks and promises of information technologies in education*. Oxford: Westview.
- Butcher, N. (2011). *A basic guide to open educational resources (OER)*. Vancouver: Commonwealth of Learning.
- Castells, M. (2009). *Communication power*. Oxford: Oxford University Press.
- Chetty, Y. (2012). Graduateness and employability within the higher education environment: A focused review of the literature. In M. Coetzee, J. Botha, N. Eccles, N. Holtzhausen, & H. Nienaber (Eds.), *Developing student graduateness and employability: Issues, provocations, theory and practical application* (pp. 5–24). Johannesburg: Knowledge Resources.
- Cooper, D. R., & Schindler, P. (1998). *Business research methods*. New York: Irwin/McGraw-Hill.
- Czerniewicz, L. (2004). Cape of storms or Cape of Good Hope? Educational technology in a changing environment. *British Journal of Educational Technology*, 35(2), 145–158.
- Czerniewicz, L., & Brown, C. (2005). Access to ICT for teaching and learning: From single artefact to interrelated resources. *International Journal of Education and Development using Information and Communication Technology*, 1(2), 42–56.
- Czerniewicz, L., & Brown, C. (2010). Born into the digital age in the south of Africa: The reconfiguration of the “digital citizen.” In L. Dirckinck-Holmfeld, V. Hodgson, C.

- Jones, D. McConnell, & T. Ryberg (Eds.), *Proceedings of the 7th International Conference on Networked Learning*, Aalborg. Retrieved from <http://www.lanacs.ac.uk/fss/organisations/netlc/past/nlc2010/abstracts/PDFs/Czerniewicz.pdf>
- De Haan, J. (2004). A multifaceted dynamic model of the digital divide. *IT & Society*, 1(7), 66–88.
- Friesen, N. (2008, June). Critical theory: Ideology critique and the myths of e-learning. *Ubiquity*, 2008. Retrieved from <http://dl.acm.org/citation.cfm?id=1386860>
- Furuholt, B., & Kristiansen, S. (2007). The rural–urban digital divide? Regional aspects of Internet use in Tanzania. *The Electronic Journal of Information Systems in Developing Countries*, 31(6), 1–15.
- Herrington, J., & Oliver, R. (2003). Patterns of engagement in authentic online learning environments. *Australian Journal of Educational Technology*, 19(1), 59–71. Retrieved from <http://www.ascilite.org.au/ajet/ajet19/herrington.html>
- Heydenrych, J., & Prinsloo, P. (2010). Revisiting the five generations of distance education: Quo vadis? *Progressio*, 32(1), 5–26.
- Johnson, B., & Christensen, L. (2008). *Educational research: Quantitative, qualitative, and mixed approaches* (3<sup>rd</sup> ed.). London: SAGE Publications.
- Kraak, A. (Ed.) (2000). *Changing modes: New knowledge production and its implications for higher education in South Africa*. Pretoria: HSRC Press.
- Livingstone, S., & Helsper, E. (2007). Gradations in digital inclusion: Children, young people, and the digital divide. *New Media Society*, 9, 671–696.
- Madon, S., Reinhard, N., Roode, D., & Walsham, G. (2009). Digital inclusion projects in developing countries: Processes of institutionalization. *Information Technology for Development*, 15(2), 95–107.
- Meconatha, D., Praul, M., & Lynch, M. J. (2008). Mobile learning in higher education: An empirical assessment of a new educational tool. *The Turkish Online Journal of Educational Technology—TOJET*, 7(3). Retrieved from <http://davidwees.com/etec522/sites/default/files/mobile%20learning%20in%20higher%20education.pdf>
- Moja, T., & Hayward, F. (2000). Higher education policy development in contemporary South Africa. *Higher Education Policy*, 13(1), 335–359.
- Panda, S., & Mishra, S. (2007). E-learning in a mega open university: Faculty attitude, barriers, and motivators. *Educational Media International*, 44(4), 323–338.
- Seymour, L., & Fourie, R. (2004). ICT literacy in higher education: Influences and unequal-

- ity. *Proceedings of 2004 Annual Research Conference of the South African Institute of Computer Scientists and Information Technologists on IT Research in Developing Countries*, South Africa. Retrieved from <http://web.up.ac.za/ecis/SACLA2010PR/SACLA2010/Papers/SACLA002.pdf>
- Shapshak, T. (2012, October 4). Africa not just a mobile-first continent—it's mobile only. Message posted to <http://www.cnn.com/2012/10/04/tech/mobile/africa-mobile-opinion/>
- Teddlie, C., & Yu, F. (2007). Mixed methods sampling: A typology with examples. *Journal of Mixed Methods Research*, 1, 77–100.
- Teferra, D., & Altbach, P. G. (2004). African higher education: Challenges for the 21<sup>st</sup> century. *Higher Education*, 47, 21–50.
- Tongco, M. D. (2007). Purposive sampling as a tool for informant selection. *Ethobotany Research & Applications*, 5, 147–158.
- Underwood, J.D.M.(2007). Rethinking the digital divide: impacts on student-tutor relationships. *European Journal of Education*, 42(2), 213–222.
- van Dijk, J., & Hacker, K. (2003). The digital divide as a complex and dynamic phenomenon. *The Information Society*, 19, 315–326.
- vanDijk, J.A.G.M. (2006). Digital divide research, achievements and shortcomings. *Poetics*, 34(4-5), 221–235.
- Waghid, Y. (2002). Knowledge production and higher education transformation in South Africa: Towards reflexivity in university teaching, research, and community service. *Higher Education*, 43, 457–488.
- Warschauer, M. (2002). Reconceptualising the digital divide. *First Monday*, 7(7). Retrieved from <http://ojphi.org/htbin/cgiwrap/bin/ojs/index.php/fm/article/viewArticle/967>
- Warschauer, M. (2003, August). Demystifying the digital divide. *Scientific American*, 42–47.

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# Emotional Presence, Learning, and the Online Learning Environment



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## Abstract

In spite of evidence that more and more students are engaging in online learning experiences, details about the transition for teachers and students to a new learning environment are still unconfirmed. While new technologies are often expected to make work easier, they also involve the development of new competencies. This change may, in itself, elicit an emotional response, and, more importantly, emotion may impact the experience of online learning. Knowledge about the impact of emotion on learning broadly is available, but not about emotion and online learning. This study presents evidence of emotions present in online environments, and empirical data which suggests emotional presence may exist as a fundamental element in an online community of inquiry.

**Keywords:** Online learning; community of inquiry; emotional presence; higher education; distance education; pedagogy

## Introduction

General wisdom has it that emotion is antithetical to thinking; the coolest head prevails (Barbalet, 2002). This may be the reason that, until recently, emotion and learning have received little attention in the development of education and instructional models. We may have Bloom and colleagues to thank for introducing us to the notion of affect as a learning domain (Krathwohl, 2002; Morrison, Ross, & Kemp, 2004). Previous studies suggest that teaching and learning with technology has a small, positive, nonsignificant ( $p > .05$ ) effect on students' affective outcomes when compared to traditional instruction. (Waxman, Lin, & Michko, 2003). However, the notion of affect, defined as the extent to which one can be influenced and affected (Davidson, 2003; Gronlund, 2000), is much different from the issue of emotion and its impact on learning—impact that may exist in all activities and do-

mains of learning (Gardner, Kornhaber, & Wake, 1996). To engage in education innovation with no reference to emotion, and continue to assume learners are little more than dispassionate thinkers, would be to miss a fundamental influence on education.

Bowlby provides the definition of emotion most amenable to understanding in reference to learning. He says, “Emotions are phases of an individual’s intuitive appraisals either of his own organismic states and urges to act or of the succession of environmental situations in which he finds himself” (1969, p. 104). For some, emotions exist comprehensively in the human experience; to ignore emotion in the human response to internal and external events is to ignore a central element of the human experience (LeDoux, 1996; Plutchick, 2003; Stets & Turner, 2006; Wosnitzer & Volet, 2005). Emotion, therefore, cannot be considered separate from the learning environment (Brookfield, 2006; Lehman, 2006; Lipman, 2003). New research regarding the impact of emotion and cognition provides compelling evidence that the relationship between emotion and learning should be examined further (Damasio, 1994, 1995, 1999, 2003; Dirx, 2008; Dirx & Cranton, 1997; Eich, Kihlstrom, Bower, Forgas, & Niedenthal, 2000; LeDoux, 1996).

Given this new information about cognition and emotion, we developed a working hypothesis that emotion plays a role in learning and, therefore, will be present in online learning environments. In addition, Dirx (2008) made a case for the integration of feeling into adult education. That impassioned argument was the impetus for this examination of the role of emotion in online learning.

Our research unfolded in two phases. The first question we set out to answer is which, if any, emotions exist in the online learning environment. Phase II of our research is a re-consideration of the role of emotion in the conceptual model of online learning proposed by Garrison, Anderson, and Archer (2000). The online community of inquiry framework served as a tool to analyze and categorize the existence of emotion across elements of the online learning experience.

## Background Information

Given that emotions exist in the broader, comprehensive human experience (Plutchick, 2003), they cannot be considered separate from the experience of the learning environment (Brookfield, 2006; Lehman, 2006). Recently, there has been an increasing focus on emotion and learning, which has been generally neglected in educational research (Schutz & Lanehart, 2002; Pekrun, Goetz, Titz, & Perry, 2002; Dirx, 2008; Värlander, 2008). Moreover, Brookfield (2006) and Dirx (2008) suggest that emotion is often mistaken as a deterrent that impedes effective teaching and learning. It is likely that emotion plays a far more dynamic role in learning than merely inhibiting rational thought and reason. An understanding of the nature of emotions in the learning context may assist the learning process as all human actions and reasoning “*require appropriate facilitating emotions if successful actions or reason at all are to be achieved* [emphasis added]” (Barbalet, 2002, p. 1).

## Emotion and learning.

When LeDoux (2002) began researching emotion in the 1970s, he chose to study fear “because it is the emotion about which we know the most” (p. 212). He assumed that what he learned would likely “be similar across emotion categories” (p. 212). At the same time LeDoux was studying emotion in rats, Damasio (1994) noticed the importance of emotion in the human experience. A neuroscientist, Damasio made his life’s work the study of emotion and the human brain, using as his subjects people whose brains were damaged through accident, surgery, or birth. His observations of a patient referred to as Elliot, who had lost his ability to draw conclusions, led him to reconsider the role of emotion in rational thought. Elliot was a brilliant lawyer, well known for his complex reasoning abilities and his ability to defend clients with intricate argument. Elliot had an accident that damaged his ability to experience emotion. Damasio became intrigued with the possibility that reduced emotion and feeling played a role in Elliot’s decision-making failures (p. 145).

This work did not go unnoticed in education. “In recent years, there has been a growing interest in the role of emotions in academic settings, especially in how emotions shape student engagement and learning” (Linnenbrink-Garcia & Pekrun, 2011, p. 1). Educational psychology has long considered motivation, particularly achievement motivation in relation to education performance, to be related to emotion (Weiner, 1985; Artino, 2009; Artino & Stephens, 2006). Callahan (2004) called for educators who espouse critical theory to “manage the emotions in their classrooms actively” (p. 82). He pointed out that “the very praxis of critical theory relies on emotion as its catalyst” (p. 75). Dirx (personal communication, 2005) questioned the appropriateness of “management” of emotion in learning environments. However, the impact on particular emotional states in relation to the learning environment is still to be understood.

Merriam and Heuer (1996) recognized that feelings of threat and fear are intrinsic in learning. Goleman (1995, p. 27), writing of face-to-face learning, described the connection between emotion and cognition as a “battle,” with the brain at the epicentre. One consequence of this battle is paradoxical. “Sometimes stress helps in formation of explicit memories but it can also devastate explicit memory” (LeDoux (1996, p. 243). Emotions, then, are a double-edged sword that may help or hinder learning.

Dirx (1998) called for the recognition of the positive emotions engendered by learning. Furthermore, he suggested that critical theory failed to “adequately account for the emotional and spiritual dimensions (para. 1)” of learning. At about the same time, Gardner (1998), Goleman (1995, 1998), and LeDoux (1996) rethought the significance of emotion. Concurrently, Damasio (1994, 1995) conducted experiments that indicate that emotion and cognition are innately intertwined. Although other researchers are beginning to build on the work of Damasio and his team, “inquiry has been slow to advance our understanding of emotions in education” (Schutz & Lanehart, 2002, p. 67). Learning processes are the currency of exchange in education, and emotional experiences are a “neglected dynamic” (Ingleton, 2000, p. 86) in complex social environments where learning takes place. This is particularly so in online learning. According to O’Regan (2003), the transition to online

teaching and learning provides the opportunity to test the assumptions about emotion embedded in our practice, building on the strands of research developed regarding emotion and the human experience, emotion and cognition, and, more recently, emotion and learning.

## Emotion and Online Learning

Lipman (2003) provides one exception to what has been a neglectful approach to emotion. He explicitly writes about emotion while describing learning through a community of inquiry. For Lipman, the community of inquiry model is “thoroughly social and communal; a method for integrating *emotive experience*, mental acts, thinking skills, and informal fallacies into a concerted approach to the improvement of reasoning and judgment [emphasis added]” (p. 18). Another exception to the neglect is the application of this same model in online learning by Garrison, Anderson, and Archer (2000), who identify emotional expression as part of being socially present online.

This model explicating teaching practice and student learning online is the community of inquiry (CoI) framework developed by Garrison, Anderson, and Archer (2000). This model has received significant attention and has been well researched (Akyol et al., 2009; Arbaugh et al., 2009). It provides a process-oriented, conceptual model that informs the practice of online instruction.

The model views community as something that emerges in support of online learning (Rovai, 2002; Thompson & MacDonald, 2005; Shea, 2006) in the relationship between three elements: social presence, teaching presence, and cognitive presence. Social presence is defined as the degree to which learners feel socially and emotionally connected with others in an online environment; cognitive presence describes the extent to which learners are able to construct and confirm meaning through sustained reflection and discourse. The central organizing element is teaching presence: the design, facilitation, and, most importantly, the direction of cognitive and social processes for the realization of personally meaningful and educationally worthwhile learning outcomes. The possibility of an expanded role for emotional presence, beyond the influence found in social presence, is central to this research.

The creative innovation that follows the development of online learning provides a unique place for the study of emotional presence and learning. As indicated by Anderson (2007), seven of fifteen indicators of social expression are expressions of emotion. Emotion is identified as important to student adjustment to the role of online learner (Cleveland-Innes, Garrison & Kinsel, 2007), the development of online community (Perry & Edwards, 2005), the choice of instructional format (Artino, 2010), and perception, expression, and self-management (Kang, Kim, & Park, 2007). Conrad (2002), in her study of emotion, vividly recounted the tumult of feelings, including anxiety, that accompany the online learning experience.

Those engaged in online learning deal with the effects of emotion on a daily basis, whether in designing instruction, teaching, or learning online. The work of Damasio and LeDoux independently suggests that emotion is neither an objective nor outcome of learning yet is

central to cognition. The study of O'Regan (2003) showed that students express their emotions in relation to the various aspects of an online course such as design and organizational issues (i.e., a lack of clear instructions), cognitive issues (i.e., learning materials, success), social issues (during communicating), time management, or technology. Similarly, Cleveland-Innes, Garrison, and Kinsel (2007) also found out that students disclosed emotions in relation to the social, teaching, and cognitive presence in an online course.

Zembylas (2008) applied qualitative methodology to investigate emotional presence, using learners' monthly emotion journals and interview strategy. The analysis resulted in two broad themes: positive and negative emotions related to learning. Positive emotions included joy, enthusiasm, and excitement for the flexibility of online learning, which were higher in intensity and frequency in earlier months; pride and contentment for fulfilling the course requirements; and surprise and excitement for the emotional nature of online communication. Negative emotions included fear and anxiety for the unknown mode of online learning and its demands (technology, time management, structure); alienation and the need for connectedness, which emerged during the first weeks of the course and when the students struggled to find satisfying ways of communicating with their classmates and their instructor; and stress and guilt for the inability to balance multiple roles and responsibilities, which is the most serious obstacle that the students faced. They struggled to combine their professional, family, and social life, which made it hard to cope with the numerous demands of the program.

Research results from multiple studies indicate that emotions are an integral part of the learning environment and influence students' learning experiences (Cleveland-Innes & Campbell, 2006). According to Baumeister, DeWall, and Zhang (2007), emotions influence outcomes. That is, positive emotions lead to positive outcomes and negative emotions to negative outcomes. The research also indicates the impeding effect of negative emotions such as stress and anger. Evidence suggests that negative emotions, such as anger and embarrassment, can influence decision making and lead people to take inappropriate risks (Baumeister et al., 2007).

In addition, excessive emotion can harm our rational thinking, and a lack of emotion can make for similarly flawed thinking (Cottrell, 2005). All these aspects come together and create a new challenge for educators in determining how to best integrate and control emotions in a learning environment. This is especially so in reference to the adjustment process that occurs as students move online. Experiencing negative emotions during adjustment to the role of online learner may interfere with the learning experience. Thoughtful consideration of emotions and possible facilitation strategies in response to negative emotions during the online adjustment process are both timely and important.

## Methodology

### Sample of Courses and Respondents

Students participating in this study were enrolled in two graduate programs at a single-mode distance education university. A total of 217 students from 19 courses agreed to participate. Courses were drawn from education, humanities, science, social science, and science, and all were delivered online. Of the 217 students consenting to participate, 33% were male and 58% were female (9% did not indicate gender). Respondents indicated their age as follows: 20–29 years, 10%, 30–39 years, 24%, 40–49 years, 43%, 50+ years, 23%. Forty-six percent of the participants reported this as their first experience in an online learning environment ( $n = 73$ ).

Additional data were collected from students in the same graduate programs using a modified CoI instrument (Arbaugh et al., 2009). The modified instrument includes previously validated item indicators for cognitive, social, and teaching presence, with the addition of new measures for emotional presence.

To qualify for sampling, courses had to be delivered using a combination of print and electronic media and online conferencing. The online conferencing component had to provide the opportunity for regular student engagement and group interaction.

### Data Collection

In the first phase of data collection, students were asked to 1) provide access to conference discussion transcripts, and 2) complete a survey of questions regarding his/her online experience. Conference discussion transcripts were collected at the end of each course. Written, detailed responses were gathered from open-ended questions related to online activities, becoming part of the online learning community and the design and facilitation of online learning. Secondary data analysis of open-ended questions and conference transcripts, originally assessed for alignment with the expectations of online learners, were evaluated for emotional content. Text analysis was completed with four individual raters using open, axial, and confirmatory analysis (Neuman, 2006). Inter-rater reliability ranged from 66% to 80%.

Once we confirmed evidence of emotional content in text about online learning and text found in conference discussions in online learning, we set out to measure whether emotion was present in one or more elements of an online community of inquiry, as proposed by Garrison, Anderson, and Archer (2000). The academic and social domains are represented in the online CoI model and measurement tool by three elements called presences: social, cognitive, and teaching presence. A similar convenience sample of seven courses was chosen from the same two graduate programs at the same university. A response rate of 38% yielded 79 completed questionnaires. The online CoI measurement instrument (Arbaugh et al., 2009) was employed, with six additional items written to measure the possibility of emotional presence. The instrument was available online through Zoomerang online survey software and self-administered by students. The possibility of response-set bias was

deterred by randomizing items measuring different types of presence.

Exploratory factor analysis (principal components extraction method) with an oblimin rotation was used. An oblimin rotation was chosen due to the theoretical interdependence of the presences. The cutoff point for significant loadings on each factor was 0.350.

## Findings

The unit of analysis for the present study is the student, in Phase I via the text-based response and in Phase II via indications of presence. Qualitative data, drawn from open-ended questions about the online experience, were evaluated by four different coders using a grounded theory analysis process of open, axial, and confirmatory coding. After the first read-through of all documentation, coders discussed the range of emotions noted in the textual data and discussed the use of terms to label expressions deemed to be 'emotional.' A preliminary list of terms was created. Data were reassessed using new terminology. Table 1 presents the list of identifiable emotional responses found in questionnaire responses and conference postings.

Table 1  
*Emotional Responses Identified in Text Data*

Constructs	Written responses to questions	Asynchronous conference transcripts
Appreciation		X
Delight		X
Desire	X	X
Disappointment	X	
Dislike		X
Emphatics	X	X
Enjoyment	X	X
Excitement	X	X
Fear	X	
Frustration	X	
Happiness	X	
Hope		X
Humour	X	X
Irony/sarcasm		X
Like		X
Passion	X	X
Preference		X
Pride	X	X
Surprise	X	
Thankfulness		X
Unhappiness	X	X
Wonder	X	
Yearning	X	X

These constructs were attached to student responses deemed to represent emotive description. Each label emerged after multiple passes through the text, and much discussion. Confirmation was achieved in two ways. Coders reached agreement regarding the labels presented here. In addition, the pattern of emotions was measured against the taxonomy of human emotions, as defined by Plutchick (2003).

Phase II of the data collection used a questionnaire administered as an online survey. Students in the same courses were invited to respond to item indicators, on a Likert scale of *Strongly Agree, Agree, Undecided, Disagree, or Strongly Disagree*. These items are drawn from the original online CoI measurement instrument measuring social presence, cognitive presence, and teaching presence (Arbaugh et al., 2009).

The revised instrument included an additional six items designed to measure emotional presence. The items listed below were written to assess emotional response in relation to the instructor, the other students, the technology, and the course:

- Emotion was expressed when connecting with other students.
- I felt comfortable expressing emotion through the online medium.
- Expressing emotion in relation to expressing ideas was acceptable in this course.
- I found myself responding emotionally about ideas or learning activities in this course.
- The instructor acknowledged emotion expressed by students.
- The instructor demonstrated emotion in online presentations and/or discussions.

Factor analysis rests on the logic that it is possible to assess patterns in relative variances of measured items such that underlying, hypothesized theoretical constructs will emerge. This analysis was completed to determine if the items measuring emotional presence would cluster together in a unique component. The extraction method was a principal components analysis with an oblimin rotation. This yielded a nine-factor solution in which four of the six items measuring emotional presence clustered into a single factor. The remaining items measuring the other three presences clustered as expected based on the theoretical model. However, the addition of emotional presence items did affect the clustering of factors, as indicated in Table 2. Items in this table are identified by the presence and sub-element they are designed to measure.<sup>1</sup>

Table 2

Factor Analysis – Nine Components	Component								
	1	2	3	4	5	6	7	8	9
V24 – TP Design and Organization									
The instructor provided clear instructions on how to participate in course learning activities.	.919								
V7 – TP Design and Organization									
The instructor clearly communicated important course goals.	.891								

<sup>1</sup> Recent research demonstrates that the general rules of thumb regarding minimum sample size are not valid or useful (MacCallum, Widaman, Zhang, & Hong, 1999; Preacher & MacCallum, 2002).

## V15 – TP Design and Organization

The instructor clearly communicated important course topics. .719

## V5 – TP Design and Organization

The instructor clearly communicated important due dates/time frames for learning activities. .601

## V33 – SP Group Cohesion

Online discussions help me to develop a sense of collaboration. .592

## V20 – TP Facilitation

The instructor helped keep the course participants on task in a way that helped me to learn. .566

## V10 – TP Facilitation

The instructor was helpful in identifying areas of agreement and disagreement on course topics that helped me to learn. .473

## V29 – TP Direct Instruction

The instructor helped to focus discussion on relevant issues in a way that helped me to learn. .440

## V2 – TP Facilitation

Instructor actions reinforced the development of a sense of community among course participants. .401

## V40 – Emotion

I found myself responding emotionally about ideas or learning activities in this course. .372

## V9 – TP Direct instruction

The instructor provided feedback that helped me understand my strengths and weaknesses relative to the course's goals and objectives. .350

## V31 – SP Open Communication

I felt comfortable participating in the course discussions. .853

V23 – SP Open Communication	
I felt comfortable interacting with other course participants.	.659
V11 – SP Group Cohesion	
I felt comfortable disagreeing with other course participants while still maintaining a sense of trust.	.609
V38 – Emotion	
I felt comfortable expressing emotion through the on-line medium.	.551
V27 – SP Affective Expression	
Online or web-based communication is an excellent medium for social interaction.	.376
V6 – SP Affective Expressions	
I was able to form distinct impressions of some course participants.	.871
V35 Emotion	
Emotion was expressed when connecting with other students.	.602
V36 – Emotion	
The instructor acknowledged emotion expressed by students.	.554
V37 – Emotion	
Expressing emotion in relation to expressing ideas was acceptable in this course.	.494
V39 – Emotion	
The instructor demonstrated emotion in online presentations and/or discussions.	.460
V3 – CP Triggering Event	
I felt motivated to explore content-related questions.	.775
V4 – CP Triggering Event	
Course activities piqued my curiosity.	.752
V28 – CP Triggering Event	
Problems posed increased my interest in course issues.	.689

V18 – CP Integration		
Learning activities helped me construct explanations/ solutions.	.639	
V16 – CP Integration		
Combining new information helped me answer ques- tions raised in course activities.	.598	
V17 – CP Exploration		
Brainstorming and finding relevant information helped me resolve content-related questions.	.568	
V34 – TP Facilitation		
The instructor was helpful in guiding the class towards understanding course topics in a way that helped me clarify my thinking.	.538	
V12 – CP Integration		
Reflection on course content and discussions helped me understand fundamental concepts in this class.	.368	.516
V13 – CP Exploration		
Online discussions were valuable in helping me appre- ciate different perspectives.	.352	
V30 – CP Resolution		
I can apply the knowledge created in this course to my work or other non-class-related activities.	.845	
V32 – CP Resolution		
I have developed solutions to course problems that can be applied in practice.	.831	
V1 – CP Resolution		
I can describe ways to test and apply the knowledge created in this course.	.519	
V8 – TP Direct Instruction		
The instructor provided feedback in a timely fashion.		-.794
V21 – CP Exploration		
I utilized a variety of information sources to explore problems posed in this course.		-.721

V19 – SP Group Cohesion

I felt that my point of view was acknowledged by other course participants.

-0.677

V25 – SP Affective Expression

Getting to know other course participants gave me a sense of belonging in the course.

-0.515

V14 – TP Facilitation

The instructor encouraged course participants to explore new concepts in this course.

-0.379

V22 – TP Facilitation

The instructor helped to keep course participants engaged and participating in productive dialogue.

-0.334

In the case of double-loadings, consideration was given to either the theoretical alignment that made the most sense or the level of the eigenvalue. One item did not load to an eigenvalue of the minimum value of .350. The last four factors were made up of five items in total and may represent interpretations of the items or the nature of the learning experience, unique to this sample. The other five factors, representing 34 of 40 items, did cluster in ways that are interpretable.

According to the CoI model, social presence is indicated by three subcategories: affective expression, open communication, and group cohesion. Teaching presence is indicated by three subcategories: design and organization, facilitation of discourse, and direct instruction. Cognitive presence is identified by four subcategories: triggering events, exploration, integration, and resolution. In the validated measurement of this instrument, the factor analysis yields three factors representing the umbrella categories of social (nine items), teaching (13 items), and cognitive (12 items) presence.

With the addition of six new measurement items related to the experience of emotion in online environments, a nine-factor solution emerged. Five of these nine factors corresponded to the theoretical model in appropriate but incomplete ways. Factor one included nine of 13 items measuring teaching presence: design and organization (4), facilitation (3), and direct instruction (2). In addition, one measure of social presence, group cohesion, and one measure of emotion loaded with this factor. The second factor yielded four of nine measures of social presence: group cohesion (1), open communication (2), and affective expression (1). One item measuring emotion loaded with this factor.

Four measures of emotional presence and one of social presence, affective expression, cluster together in factor three. These four items refer to emotion as expressed by students and the instructor, in relation to ideas and in discussion and presentation.

Eleven of the 12 items designed to measure cognitive presence loaded together, but in two factors. The fourth factor in the nine-factor solution emerged from cognitive presence, trig-

gering event (3), cognitive presence, exploration (2), and cognitive presence, integration (3). One teaching presence item, facilitation, loaded with this factor. This item referred to guidance on understanding that “helped clarify thinking.” Factor five was made of the three cognitive presence, resolution, items.

Six items loaded either singly, in pairs, or without a valid eigenvalue. These items were not seen as indications of individual concepts but rather idiosyncratic representations of this sample.

## Discussion

Our research involved two phases. In the first phase, we considered the possibility that the online experience elicited, and is steeped in, emotion. We confirmed that emotion is present for students 1) when they discuss the online experience, and 2) in the experience of engaging in online learning. In addition, we began to see the type of emotion that exists in one, the other, or both. This begins to add the ‘what’ and ‘when’ of the emotional experience to earlier work that suggests emotion is present in the online experience (Artino, 2009; Cleveland-Innes, Garrison, & Kinsel, 2007; Conrad, 2002; Zembylas, 2008).

The challenge of identifying, labeling, and discussing the subjective, emotional experience in text-based evidence makes it difficult for us to precisely define each emotive response and label from this data. We noted several regular patterns, giving us confidence we were getting closer to the real picture of the emotional experience of working online. First, text from the more complex interaction found in conference postings, compared to single-person response to questions in a survey instrument, demonstrated more numerous, complex, and interrelated emotional tone. Second, in spite of this difference in complexity, emotional range was very similar. Nine emotional responses were common to the experience of discussing the online experience and the experience itself as indicated in Table 1. Finally, this range of emotion was somewhat bounded; Plutchick’s taxonomy of human emotion covers a far greater range than what was identified here. It is possible that certain emotions are notable in relation to learning and others less common.

In the second phase of this research, emotional presence indicators were added to the measurement of the three current theoretical elements that make up a community of inquiry. Given the range of emotional language expressed in the text of discussion forums and in the text describing the experience of being an online student, we submit that emotion is experienced by online students in areas beyond the expression of social presence.

Garrison, Anderson, and Archer (2000) define social, cognitive, and teaching presence in the following ways.

**Social presence:** The ability of participants in a community of inquiry to project themselves socially and emotionally, as ‘real’ people (i.e., their full personality), through the medium of communication being used.

**Cognitive presence:** The extent to which learners are able to construct and confirm meaning

through sustained reflection and discourse in a critical community of inquiry.

Teaching presence: The design, facilitation, and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes.

Emotion is noticeably absent from the discussion of teaching and cognitive presence. Emotion and affective response is part of social presence, and any connection with cognitive and teaching presence is deemed to occur through an overlap with social presence. Lipman (2003), the original creator of the community of inquiry notion for higher education, doesn't make the same distinction. For Lipman, emotive experience integrates with thinking to improve reason and judgment.

In emotional presence as measured here, the emotive experience does exist in combination with social presence, but it also clusters together as a unique presence. While Garrison (2007) suggests that "the face-to-face environment can more easily provide socio-emotional support" (p. 64), such support is essential online, beyond socio-emotional support to negotiating emotion that exists in and of itself, in relation to teaching and cognition. Based on our data, emotional presence is not just the affective response that presents itself through social presence; rather, it underpins the broader online experience. We define emotional presence as the following:

Emotional presence is the outward expression of emotion, affect, and feeling by individuals and among individuals in a community of inquiry, as they relate to and interact with the learning technology, course content, students, and the instructor.

This emotion will emerge as part of the transition to online learning and in the learning experience itself. In spite of evidence that more and more students are engaging in online learning (Allen & Seaman, 2010), clarity about the transition to a new learning environment is still unconfirmed (Cleveland-Innes, Garrison, & Kinsel, 2007). While new technologies are often expected to make work easier, they also involve the development of new competencies (Birch, 2001). For Birch, the dimensions of these new competencies are not yet clear; implementation of new technology for learners has sped well ahead of our understanding of necessary competencies. This creates two problems. One is that learners are left to create their own understanding and develop the skills to succeed in this technologically mediated environment. Second is that the emotion created by dealing with this new learning environment is still to be addressed. Knowledge about the impact of emotion on learning broadly (Brookfield, 2006; Lipman, 2003) is starting to emerge, but we are at early stages of discerning appropriate actions by students and teachers online, let alone being able to explain how emotion impacts online learning.

It is beyond the scope of this paper to discuss the pattern of factors somewhat different from the original factor analysis that tested this instrument. The cluster of items was supportive enough of the original model that we feel confident suggesting that emotional presence may exist in combination with other presences theorized and measured as part of an online community of inquiry.

### Expanding the Online Community of Inquiry

An online community of inquiry is a distinct personal and public search for community, meaning, and understanding. New roles are necessitated by the nature of the communication, which compels students to assume greater responsibility for, and control over, their learning. Under this enhanced communication, “each form of transport not only carries, but translates and transforms the sender, the receiver and the message” (McLuhan, 1995, p. 90). In addition to onlinedness (Hughes, 2004), a collaborative learning community necessitates the adoption of personal responsibility and shared control. This goes to the heart of an online learning community—a significant shift from the transmission of information in the lecture hall and the passive role of students.

Thus, online learning communities demand role adjustments. In the context of a new social role, the pathway to competence will occur over time as the role becomes prevalent and normalized. In this early stage, online communities will contribute to the socialization process for those engaging in this new role. The result is a new role and a new identity for learners. While the adoption and enactment of social roles is a standard, commonplace element of everyday experience, becoming an online learner has a unique characteristic. For many learners, role models for learning the required and expected activities are not present until one is already engaged in an online course (Garrison & Cleveland-Innes, 2004). Emotion presents itself at two junctures: one in relation to the adjustment to a new role as online learner and the second in combination with cognitive, social, and teaching presence. This supports the detailed work of Zembylas (2008), an example of the emotional adjustment process and the positive and negative emotions that influence students’ online learning experiences.

In this regard, we propose that ongoing analysis of emotions through the lens of the CoI framework will allow us to organize and develop appropriate interventions and thus new learning environments in which students can adjust to the new role and develop their social, emotional, teaching, and cognitive presences more effectively. Employing the CoI framework enables a comprehensive view of the dynamic and complex nature of online learning, including emotion. The three elements of the framework (i.e., social, teaching, and cognitive presence) present the main aspects of an online learning experience that cause and/or affect emotional arousal.

The implications of the emotional presence confirmed in this study are explained by Lehman (2006); emotions create presence as “presence is the result of the dynamic interplay between emotion, behaviour, cognition and the environment” (p. 13). Lehman further explains that individuals are perceptual by nature and dynamically interacting within the perceptual field to create representation of the world; throughout this dynamic, enactive pro-

cess emotions affect behavior and cognition and impact our experience of presence. They are key to the interaction process in the perceptual world in that they focus our perceptions on particular aspects of a situation and enable us to concentrate on specific situations, connect the affective to the cognitive, and arrive at thoughtful and appropriate decisions.

## Conclusions

Emotion may constrain learning as a distracter but, if managed, may serve as an enabler in support of thinking, decision making, stimulation, and directing. Online learning is replete, not fraught, with emotion. We conclude, with others, that emotion is present in online learning communities (Campbell & Cleveland-Innes, 2005; Derks, Fischer, & Bos, 2007; Marchand & Gutierrez, 2011; O'Regan, 2003; Lehman, 2006; Perry & Edwards, 2005). Research on emotional presence within an online community of inquiry demonstrates the salience of emotion in online learning. Given this reality, emotion must be considered, if not a central factor, at least as a ubiquitous, influential part of learning—online and otherwise (Plutchick, 2003; Stets & Turner, 2006; Wosnitza & Volet, 2005). Therefore, emotions expressed in the online experience, as explained by the CoI model (Garrison, Anderson & Archer, 2000), indicate that emotional presence exists in social, cognitive, and teaching presence.

Our exploratory study must now be replicated with deductive emotional coding structures and larger samples to validate our exploratory statistical analysis. Future research requires that we determine first which emotions are present in common human exchanges and in any learning environment then identify if emotions in online environments are the same or different. Key to online environments is to acknowledge and discuss emotional tenor as much communicative information is lost without tone of voice and facial expressions—emoticons excepted. The exploration of emotional states that are *not* present—hidden yet influential—needs attention.

With evidence that emotions exist in all aspects of an online community of inquiry, consideration of the appropriate response is next. How does this impact design and organization, facilitation, and direct instruction? Which emotions, if any, are found uniquely in the triggering events, exploration, integration, and resolution found in cognitive presence? And what of the overlaps in all three presences and the possible emotion that may exist there? In addition, emotion and online learning may be explored in pedagogical models other than the CoI.

At the end of our deliberations, we define emotional presence as an experience that is salient in the online environment. It is a topic worthy of further study. In common practice, emotions are unexamined, seemingly visceral and unconscious. This is not appropriate in reflective pedagogy designed to bring cognition to consciousness. Learners need to understand the role of emotion in life and in learning to realize their benefits. This moves learners beyond the role of unaware victim of the human emotion response to conscious manager of emotion. Instructors can model emotional response (Brookfield, 2006) and its place in

the instructor's own learning (Kort, Reilly & Picard, 2001) and teach how to bring emotion to consciousness and make use of the emotional state in a learning situation (Campbell & Cleveland-Innes, 2005). "As an instructor, it's crucial that you set up the learning situation in a manner that arouses learners' feelings of security, well-being, and self-confidence. It's equally important to challenge them without threats, intimidation, or pressure" (Weiss, 2000, p. 3).

## References

- Akyol, Z., Arbaugh, B., Cleveland-Innes, M., Garrison, R., Ice, P., Richardson, J., & Swan, K. (2009). A response to the review of the community of inquiry framework. *Canadian Journal of Distance Education, 23*(2), 123–136.
- Allen, I. E., & Seaman, J. (2010). *Learning on demand: Online education in the United States, 2009* (Research Report No. 7). Retrieved from <http://www.sloanc.org/publications/survey/pdf/learningondemand.pdf>
- Anderson, T. (2007). *Social and cognitive presence in virtual learning environments*. Keynote lecture, CHAIS Conference, The Open University of Israel. Retrieved from <http://www.slideshare.net/terrya/social-and-cognitive-presence-in-virtual-learning-environments>
- Arbaugh, J. B., Cleveland-Innes, M., Diaz, S., Garrison, D. R., Ice, P., Richardson, J. C., Shea, P., & Swan, K. (2009). Developing a community of inquiry instrument: Testing a measure of the Community of Inquiry framework using a multi-institutional sample. *The Internet and Higher Education, 11*, 133–136.
- Artino, A. R. Jr. (2009). Think, feel, act: Motivational and emotional influences on military students' online academic success. *Journal of Computing in Higher Education, 21*, 146–166.
- Artino, A. R. Jr. (2010). Online or face-to-face learning? Exploring the personal factors that predict students' choice of instructional format. *Internet and Higher Education, 13*(4), 272–276.
- Artino, A. R. Jr., & Stephens, J. M. (2006). Learning online? Motivated to self-regulate? *Academic Exchange Quarterly, 10*, 176–182.
- Barbalet, J. (2002). Introduction: Why emotions are crucial. In J. Barbalet (Ed.), *Emotions and sociology* (pp. 1–19). Oxford: Blackwell.
- Baumeister, R. F., DeWall, C.N., & Zhang, L. (2007). Do emotions improve or hinder the decision making process? In K. D. Vohs, R. F. Baumeister, R. F. & G. Loewenstein (Eds.), *Do emotions help or hurt decision making? A hedgefoxian perspective* (pp. 11–31). New York: Russell Sage.
- Birch, D. (2001). e-Learner Competencies. Retrieved from [http://www.brightways.net/Articles/wpo1\\_elc.pdf](http://www.brightways.net/Articles/wpo1_elc.pdf)
- Bowlby, J. (1969). *Attachment and loss* (Vol. I). New York: Basic Books.
- Brookfield, S. D. (2006). *The skillful teacher: On technique, trust and responsiveness in the classroom*. San Francisco: Jossey-Bass.

- Callahan, J. L. (2004, Summer). Breaking the cult of rationality: Mindful awareness of emotion in the critical theory classroom. *New Directions for Adult and Continuing Education, 102*, 75–83.
- Campbell, P. & Cleveland-Innes, M. (2005, August). Affect as presence in online communities of inquiry. *Proceedings of 21st Annual Conference of Distance Teaching and Learning*, Madison, WI.
- Cleveland-Innes, M., Garrison, R., & Kinsel, E. (2007). Role adjustment for learners in an online community of inquiry: Identifying the needs of novice online learners. *International Journal of Web-based Learning and Teaching Technologies, 2*(1), 1–16.
- Cleveland-Innes, M., & Campbell, P. (2006, November). *Understanding emotional presence in an online community of inquiry*. Paper presented at the 12th Annual SLOAN-C ALN Conference, Orlando, Florida.
- Conrad, D. (2002). Engagement, excitement, anxiety, and fear: Learners' experience of starting an online course. *American Journal of Distance Education, 16*(4), 205–226.
- Cottrell, S. (2005). *Critical thinking skills: Developing effective analysis and argument*. London: Palgrave Macmillan.
- Damasio, A. R. (1994, October). Descartes' error and the future of human life. *Scientific American, 144*–145.
- Damasio, A. R. (1995). *Descartes' error: Emotion, reason and the human brain*. New York: Quill.
- Damasio, A. R. (1999). *The feeling of what happens: Body and emotion in the making of consciousness*. Orlando, FL: Harcourt.
- Damasio, A. R. (2003). *Looking for Spinoza: Joy, sorrow and the feeling brain*. Orlando, FL: Harcourt.
- Davidson, R. J. (2003). Seven sins in the study of emotion: Correctives from affective neuroscience. *Brain and Cognition, 52*, 129–132.
- Dirkx, J. M. (2008). The meaning and role of emotions in adult learning. *New Directions for Adult and Continuing Education, 120*, 7–18.
- Dirkx, J.M. (1998). Knowing the self through fantasy: Toward a mytho-poetic view of transformative learning. *Proceedings of the Adult Education Research Council*. Retrieved from <http://www.adulterc.org/Proceedings/1998/98dirkx.htm>
- Derks, D., Fischer, A.H., & Bos, A. (2008). The role of emotion in computer-mediated communication: A review. *Computer Human Behavior, 24*, 766–785.

- Dirkx, J. M., & Cranton, P. (Eds.) (1997). Nurturing soul in adult learning. *New Dimensions for Adult and Continuing Education*, 74, 79–88.
- Eich, E., Kihlstrom, J. F., Bower, G. H., Forgas, J. P., & Niedenthal, P. M. (2000). *Cognition and emotion*. Oxford: Oxford University Press.
- Gardner, H. (1998). A multiplicity of intelligences. *Scientific American Presents*, 9(4), 18–23.
- Gardner, H., Kornhaber, M. L., & Wake, W. K. (1996). *Intelligence: Multiple perspectives*. Belmont, CA: Wadsworth/Thomson Learning.
- Garrison, D. R. (2007). Online community of inquiry review: Social, cognitive, and teaching presence issues. *Journal of Asynchronous Learning Networks*, 11(1), 61–72.
- Garrison, D. R., & Cleveland-Innes, M. (2004). Critical factors in student satisfaction and success: Facilitating student role adjustment in online communities of inquiry. In J. Bourne & J. C. Moore (Eds.), *Elements of quality online education: Into the mainstream. Vol. 5 in the Sloan C Series* (pp. 29–38). Needham, MA: The Sloan Consortium.
- Garrison, D. R., Anderson, T., & Archer, W. (2000). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education*, 2, 1–19.
- Goleman, D. (1995). *Emotional intelligence: Why it can matter more than IQ*. New York: Bantam Books.
- Goleman, D. (1998). *Working with emotional intelligence*. New York: Bantam Books.
- Gronlund, N. E. (2000). *How to write and use instructional objectives*. Toronto: Prentice-Hall.
- Hughes, J. (2004). Supporting the online learner. In T. Anderson & F. Elloumi (Eds.), *Theory and practice of online learning*. Athabasca, AB: AU Press.
- Ingleton, C. (2000). Emotion in learning – a neglected dynamic. In R. James, J. Milton, & R. Gabb (Eds.), *Research and development in higher education. Vol. 22 of Cornerstones of Higher Education* (pp. 86–99). Melbourne, AU: Research and Development Society of Australasia..
- Kang, M., Kim, S., & Park, S. (2007). Developing emotional presence scale for measuring students' involvement during e-Learning process. In C. Montgomerie & J. Seale (Eds.), *Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications 2007* (pp. 2829–2832). Chesapeake, VA: AACE.
- Kort, B., Reilly, R., & Picard, R. (August, 2001). An affective model of interplay between

- emotions and learning: Reengineering educational pedagogy –Building a learning companion. *Proceedings of International Conference on Advanced Learning Technologies (ICALT 2001)*. Madison, WI.
- Krathwohl, D. (2002). A revision of Bloom's taxonomy: An overview. Retrieved from [http://www.unco.edu/cetl/sir/stating\\_outcome/documents/Krathwohl.pdf](http://www.unco.edu/cetl/sir/stating_outcome/documents/Krathwohl.pdf)
- LeDoux, J. (1996). *The emotional brain: The mysterious underpinnings of emotional life*. New York: Simon & Schuster.
- LeDoux, J. (2002). *The synaptic self: How our brains become who we are*. New York: Penguin.
- Lehman, R. (2006). The role of emotion in creating instructor and learner presence in the distance education experience. *Journal of Cognitive Affective Learning*, 2(2), 12–26.
- Linnenbrink-Garcia, L., & Pekrun, R. (2011). Student emotions and academic engagement. *Contemporary Educational Psychology*, 36(1), 1–3.
- Lipman, M. (1991). *Thinking in education*. Cambridge: Cambridge University Press.
- MacCallum, R. C., Widaman, K. F., Zhang, S., & Hong S. (1999). Sample size in factor analysis. *Psychological Methods*, 4, 84–99.
- Marchand, G. C., & Gutierrez, A. P. (2011). The role of emotion in the learning process: Comparisons between online and face-to-face learning settings. *The Internet and Higher Education*, 15(3), 150–160. doi:10.1016/j.iheduc.2011.10.001.
- Merriam, S. B., & Heuer, B. (1996). Meaning-making, adult learning and development: A model with implications for practice. *International Journal of Lifelong Education*, 15(4), 234–255.
- McLuhan, M. (1995). *Understanding media: The extensions of man*. Cambridge: MIT Press.
- Morrison, G.,R., Ross, S.,M., & Kemp, J.,E. (2004). *Designing effective instruction*. Hoboken, NJ: John Wiley & Sons.
- Neuman, W. L. (2006). *Social research methods: Qualitative and quantitative approaches* (6<sup>th</sup> ed.). New York, NY: Pearson Publishing.
- O'Regan, K. (2003). Emotion and e-learning. *Journal of Asynchronous Learning Networks*, 7(3), 78–92.
- Pekrun, R., Goetz, T., Titz, W., & Perry, R. P. (2002). Academic emotions in students' self regulated learning and achievement: A program of qualitative and quantitative re-

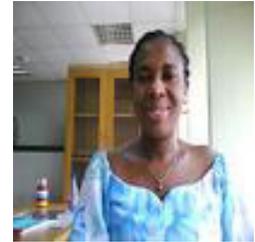
- search. *Educational Psychologist*, 37(2), 91–105.
- Perry, B., & Edwards, M. (2005). Exemplary online educators: Creating a community of inquiry. *Turkish Online Journal of Distance Education*, 6(2), 46–54. Retrieved from <http://tojde.anadolu.edu.tr/tojde18/index.htm>
- Plutchick, R. (2003). *Emotions and life*. Washington, DC.: American Psychological Association.
- Preacher, K. J., & MacCallum, R. C. (2002). Exploratory factor analysis in behavior genetics research: Factor recovery with small sample sizes. *Behavior Genetics*, 32, 153–161.
- Rovai, A. P. (2002). Sense of community, perceived cognitive learning, and persistence in asynchronous learning networks. *The Internet and Higher Education*, 5(4), 319–332.
- Schutz, P. A., & Lanehart, S. J. (2002). Introduction: Emotions in education. *Educational Psychologist*, 37, 67–68.
- Shea, P. (2006). A study of students' sense of learning community in online environments. *Journal of Asynchronous Learning Networks*, 10(1). Retrieved from <http://sloan-consortium.org/jaln/v10n1/study-students%E2%80%99sense-learning-community-online-environments>
- Stets, J. E., & Turner, J. H. (Eds.) (2006). *Handbook of the sociology of emotions*. New York: Springer.
- Thompson, T. L., & MacDonald, C. J. (2005). Community building, emergent design and expecting the unexpected: Creating a quality eLearning experience. *The Internet and Higher Education*, 8(3), 233–249.
- Värlander, S. (2008). The role of students' emotions in formal feedback situations. *Teaching in Higher Education*, 13(2), 145–156.
- Waxman, H. C., Lin, M.-F., & Michko, G. M. (2003). A meta-analysis of the effectiveness of teaching and learning with technology on student outcomes. Retrieved from <http://www.ncrel.org/tech/effects2/>
- Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review*, 92(4), 548–573.
- Weiss, R. (2000). Emotion and learning – Implications of new neurological research for training techniques. *Training and Development*, 16. Retrieved from [http://findarticles.com/p/articles/mi\\_m4467/is\\_11\\_54/ai\\_67590800/pg\\_3/](http://findarticles.com/p/articles/mi_m4467/is_11_54/ai_67590800/pg_3/).
- Wosnitza, M., & Volet, S. (2005). Origin, direction and impact of emotions in social online learning. *Learning and Instruction*, 15(5), 449–464.

Zembylas, M. (2008). Adult learners' emotions in online learning. *Distance Education*, 29(1), 71–87.

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## A Needs Assessment of ODL Educators to Determine their Effective Use of Open Educational Resources



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### Abstract

Nigeria has joined the global race of teaching and learning in a changing educational environment by adopting open and distance learning (ODL). Although it is a global trend, ODL poses some challenges at local levels, one of which is the untimely production of teaching materials currently affecting instructional delivery in Nigeria. The modern approach to ameliorating this challenge is the deployment of open educational resources (OER), and this practice is enabled by information and communication technology (ICT). Hence, today's educators need OER tools and ICT skills to address the changing nature of education. This paper assessed the needs, readiness, and willingness of ODL professionals from two dual-mode universities in Nigeria to deploy OER in teaching and learning. Data were collected using structured questionnaire items. The major findings of the study's survey indicated that educators have not really embedded OER in teaching and learning, but they are very eager to be trained in the rudiments of OER and wish to employ them thereafter. The results indicate there is an urgent need for professional development to include training in the rudiments of OER for educators.

**Keywords:** Open education resources; educators; instructional materials; distance learner

## Introduction

“Everyone has the right to education” (United Nations, 1948, Article 26); this right was enshrined in the Universal Declaration of Human Rights over sixty years ago. Therefore, many countries are making a concerted effort to ensure that all people have the opportunity to be educated, a target in line with Education for All (EFA) and the Millennium Development Goals (MDG), which both placed emphasis on the issue. This effort is exemplified in the modern adoption and deployment of open and distance education delivery systems in Nigeria to fulfill the nation’s commitment to provide education for all, within the context of reaching the World Forum on Education for All (EFA) goals by 2015. These goals involve ensuring that the learning needs of all young people and adults are met through equitable access to appropriate learning and life skills programs; improving all aspects of quality of education; and ensuring excellence for all so that recognized and measurable learning outcomes are achieved, especially in literacy, numeracy, and essential life skills (Federal Ministry of Education, 2002).

The substantial efforts several governments have made to achieve EFA and MDGs have led to a significant increase in the number of children attending primary and secondary schools in developing countries (Wright & Reju, 2012). Many African countries have invested heavily in education because it is widely accepted as a leading instrument for promoting economic growth (Bloom, Canning, & Chan, 2006, p. 1), and Nigeria is not an exception. Nevertheless, higher education in Nigeria has been under immense pressure to grow from a population that increasingly demands access. The National Open University of Nigeria (NOUN), the premier open and distance learning (ODL) university in the country, was established to widen access to all. But demand is still high, so ODL has come to be recognized in Nigeria as a viable alternative to the conventional school system which hitherto dominated the country’s education sector. There are currently six schools in the country which may be regarded as dual-mode universities, with limited capacity to deliver degree programs using open and distance learning in addition to the conventional face-to-face mode (NUC, n.d.).

Researchers have observed that only 36% of those who want to enroll in secondary education programs in sub-Saharan Africa can find seats in schools (UNESCO, 2011). In Nigeria, this situation is even worse at the tertiary level of education, which is expected to provide the opportunity for those willing and able to further their studies. But providing education for all is a daunting task, considering the size of the country’s population (about 150 million), and the compelling needs of the people (Okonkwo, 2012). The ever-growing demand for education in Nigeria cannot be met by the traditional means of face-to-face classroom instructional delivery alone.

The National Open University of Nigeria was established because the capacity of face-to-face conventional tertiary institutions in Nigeria was insufficient. For instance, about 1.5 million candidates sat for the 2012 Unified Tertiary Matriculation Examination (UTME) in Nigeria. A breakdown of the applications to the Joint Admission and Matriculation Board (JAMB) showed that 83,865 individuals applied for admission at the University of Lagos in 2012, and 99,115 in 2011 (Alechenu, 2012); the school’s capacity, according to the National

Universities Commission (NUC, the regulatory body for universities in Nigeria), is only 9,507. These figures only include applicants selecting the university as their most preferred choice, and do not include those who listed it as their second choice.

Also, in South Africa, 85,000 potential learners applied for one of the only 11,000 seats available at the University of Johannesburg (Polgreen, 2012). Allen (2010) opined that, “globally, of those 20 years old or younger people, 30 million are qualified to attend university, but there are no places for them. This number is likely to increase by 100 million in 2020.” In their own report, Atkins, Brown, and Hammond (2007) remarked that, “in order to serve the number of youths qualified to enter university in 2020, a major university would need to be opened every week.” This statement agrees with Wright and Reju’s submission (2012) that demand for education, especially in sub-Saharan Africa, is much greater than what existing and planned academic institutions can accommodate. UNESCO estimates (based on 2004 data) that 3.8 million teachers will have to be recruited by 2015 in Africa alone if the goal of universal primary education is to be achieved (United Nations, 2009, p. 16). According to Wright and Reju (2012), African governments do not have the financial resources to hire that number of teachers. For instance, between 1991 and 2006, the number of students registered in African higher education institutions rose by 16%, but expenditures on education rose by only 6% (World Bank, 2010). Hence, the demand for educational services is outstripping what countries are allocating to education.

In some local areas in Anambra State of Nigeria, teachers are hired and paid by the parent-teacher association (PTA) to teach in primary schools in order to make up for the shortage of the required number of teachers in the system. This challenge is not peculiar to Nigeria alone. The Niger Republic also hired “Volunteer” teachers (Lambert, 2004) who had no teaching experience and often lacked knowledge of subject matter they were teaching. In the Republic of Congo, some teachers were not paid for several years (Prozonic, 2011). These realities mean it is therefore not feasible for governments to continue to build, staff, and resource schools, universities, and teacher training facilities in order to meet the demand over the next 5, 10, and 20 years (Wright & Reju, 2012).

In order to fully realize the concepts of education for all and equitable access to educational opportunities, experts are exploring other options. Notable opportunities are the increased use of distance education combined with information and communication technologies (ICTs), which have greatly influenced education and teaching practices in recent years, in addition to OER, which are being researched for use in both conventional and distance education settings.

It is clear that unless the assumptions that guide academics in open and distance learning are precisely defined, problems of “quality” and “equity” will haunt this mode of education (Das, 2010). There has been a remarkable increase in OER production since 2002, when it was first defined in a UNESCO workshop. There has also been a strong international debate on how to apply OER in actual practice, and UNESCO chaired a vivid discussion about this through its International Institute of Educational Planning (IIEP) (Das, 2010).

Before now, distance education referred to a kind of learning made possible over spatial distance between the teacher and the learner. But today's open and distance education is no longer what it used to be. In the changing arena of higher education today, the description of open and distance education has to include "arrangements to enable people to learn at the time, place and space which satisfies their circumstances and requirements" (Das, 2010). Open education resources make learning available at the time of the learner's choice and at a place suited to his or her requirements. Thus, addressing the issue of openness in distance education contextually and pedagogically brings along with it the need to use digital technologies and ICT beyond borders. I envisage OER as a tool to enable viable outreach in higher education systems in general, and ODL in particular, incorporating innovative strategies in teaching and learning. I also anticipate that OER are capable of enriching learning much more than the materials that we have in the face-to-face institutions, which hitherto have been handicapped by a lack of resources. Despite the laudable vision of ODL globally, it poses some challenges to educators in Nigeria (Okonkwo & Ikpe, 2011). For instance, the writing and development of instructional materials, the backbone of instructional delivery, continues to be a major hindrance to NOUN's vision and mission (Okonkwo, 2012).

This paper focused on the premise of using open educational resources as viable tools for all professionals in open and distance learning to enable their successful participation in the changing educational environment. These resources are becoming increasingly accepted as part of the range of materials that learners and educators can use to bring about change in educational systems in a profound way. But the method of learning in this open way does not come naturally to everyone. Hence there is a need for educators to access continuing professional development in the effective use of open educational resources. Such training will equip them with the knowledge of how this open approach operates for teaching and learning. This paper therefore assessed the need for continuing professional development for educators with respect to open educational resources.

### Conceptual Framework

Open education resources are teaching, learning, and research resources that reside in the public domain or creative common area and are freely available to anyone over the Web. They are an important element of the learning infrastructure and range from podcasts and digital libraries to royalty-free textbooks and games. There have been many definitions of OER; I provide four here.

Open Educational Resources (OER) are teaching, learning, and research resources that reside in the public domain or have been released under the intellectual property right license that permits their free use or re-purposing by others. Open educational resources include full courses, course materials, modules, textbooks, streaming videos, tests, software, and any other tools, materials, or techniques used to support access to knowledge (Atkins, Brown, & Hammond, 2007).

Open Educational Resources (OER) are materials that may be freely used to support education and may be freely accessed, reused, modified and shared by anyone (Downes, 2011).

Open Educational Resources (OER) are teaching, learning and research materials in any medium that reside in the public domain or have been released under an open license that permits their free use and re-purposing by others (Creative Commons, 2012).

Open Educational Resources are digitized materials offered freely and openly for educators, students, and self-learners to use and reuse for teaching, learning and research. OER includes learning content, software tools to develop, use, and distribute content, and implementation resources such as open licenses (Organization for Economic Cooperation and Development, 2007).

The above definitions illustrate that the definition of OER is maturing parallel to the increased adoption of open education by formal education institutions around the world.

Other scholars have also defined OER as teaching, learning, and research resources with intellectual property licenses that permit them to be reused, reworked, remixed, and re-distributed (D'Antoni, 2009; Hilton, Wiley, Stein, & Johnson, 2009; Plotkin, 2010; Wiley, 2009). They observed that some conditions may be placed on the use of OER, such as the provision of attribution, but all OER are accessible to anyone. They are seen as having the potential to change the practice of learners, educators, and organizations in a profound way (McAndrew, 2010). These untapped resources have the potential to reduce costs, improve quality, and increase access to educational opportunities (Daniel, 2011; Plotkin, 2010; Wright & Reju, 2012). Educators can find free-to-use teaching content from around the world to add to the OER commons. The resources offer opportunities to create systemic

change in teaching and learning through accessible content, and, importantly, they embed participatory processes in the courses that use them. The content comes from trusted individuals and organizations.

For ODL practitioners in Nigeria to benefit from this laudable trend of OER offerings in education, they have to be knowledgeable enough about the issues involved to use them. It is only when Nigerian educators have been trained that they can effectively contribute to the global discussion on OER and use them meaningfully in the education system.

Reliable sources of OER include (but are not limited to)

- The Open CourseWare Consortium (<http://www.ocwconsortium.org/>)
- The UNESCO Open Training platform (<http://www.opentrainingplatform.org/>)
- The UNESCO Open Educational Resource platform (<http://www.oerplatform.org/>)
- OER Africa: A dynamic network of African OER practitioners that connects like-minded educators—teachers, academics, and trainers—and permits them to develop, share, and adapt OER to meet the educational needs of African societies (<http://www.oerafrica.org/>)

Some of these resources include understanding OER, finding OER, and OER in action.

- OpenLearn (<http://openlearn.open.ac.uk/>)
- LORO (Language Open Resources Online) (<http://www.open.ac.uk/education-and-languages/loro/>)
- Wikiversity: A Wikimedia Foundation project devoted to collecting learning resources, learning projects, and research for use in all levels, types, and styles of education, from preschool to university, including professional training and informal learning (<http://en.wikiversity.org/>)
- The Open Education Quality Initiative: provides guidelines, tools, and best practices of open education for organizations and individuals. Enables them to self-assess their level of adoption and integration of Open Educational Practices (OEP; <http://www.oer-quality.org/>). (Leichty, 2012)

## Benefits of OER

The potential benefits of OER for users already identified in literature (Das, 2010) are

- independent discussion forum and news forum for programs;
- online interaction facility among fellow students, faculty members, and even officials of the institution;

- materials which can both be studied online and downloaded if necessary;
- old examination questions posted online so that students can learn the patterns of questions that are asked;
- recent activity reports on the members/users in the community;
- online self-assessment tests, which a student can use to test himself or herself on a particular topic or issue;
- provisions for uploading special writings by teachers/experts;
- facility where students can view the list of online participants reviewing a particular topic so that they can communicate with each other through chatting.

Open and distance learning institutions and educational leaders must grasp the potential of OER by making the collective commitment to use this innovation in order to pursue the goal of education for all. This can be achieved by building on the OER success stories of the African Virtual University (AVU), OER Africa, SAIDE, the Virtual University for Small States of Commonwealth (VUSSC, <http://www.vussc.info/>), and other African and global OER initiatives. In addition to earlier identified benefits, Wright and Reju (2012, p. 189) opined that OER

- have the potential to increase accessibility to quality educational materials at a lower cost to the user, thereby allowing governments and institutions to divert funds to other critical areas such as learner support, faculty professional development, research, and teacher recruitment and retention;
- enable individuals to freely access information they can use to make decisions that affect their lives and ultimately the progress of societies; and
- have the potential to allow for flexible, quality education through distance learning, and to assist most African countries to meet the increased demand for secondary and higher education.

Kanwar, Kodhandaraman, and Umar (2010) noted that one of the emerging issues in educational discourse today is the development and use of open educational resources, and their potential to expand access to and improve the quality of education, particularly in developing countries where there is a dearth of quality materials. The Commonwealth of Learning (COL) supported the development of the Science, Technology, and Mathematics Program (STAMP 2000+) teachers' training materials in the late nineties, long before the term OER had entered the educational lexicon (Kanwar et al., 2010). They stated that 140 course writers from eight south African countries, namely, Botswana, Malawi, Mozambique, Namibia, South Africa, Tanzania, Zambia, and Zimbabwe, wrote 46 modules of material for training upper primary and junior secondary teachers. The modules focused on four subject areas: science, technology, mathematics, and general education. Yet an external evaluation of the

COL's programs conducted in 2006 revealed that there was very little attempt to use the modules by teacher education institutions in Africa (Spaven, cited in Kanwar et al.). The reasons ascribed for not using these materials as expected were lack of awareness about the program and its benefits; no clear strategy for implementation; and assumption that once OER are developed, teacher training institutions would automatically use them (Kanwar et al., 2010). They advocated based on the lessons learned from the above experience that, henceforth, there were three important issues to address.

- It was not enough to develop a capacity and content, the creators must ensure a buy-in from local partners and have a clear implementation strategy;
- A governance structure must be put in place to steer the project and monitor progress according to agreed-upon quality standards;
- There must be increased capacity in online course development; content writers should develop courses that are needs-based and freely available to strengthen national educational and tertiary institutions.

The advocacy of Kanwar et al. (2010) can only be effective if teachers are first empowered with the necessary ICT skills. Giving basic ICT training will open more opportunities for them in the following ways:

- increasing their modern teaching skills (including ICT), which enables instructors to use educational resources available beyond their borders to enhance their teaching abilities;
- allowing them to reach a larger number of students by tapping into their expertise to improve literacy through frequent interaction with the students and helping them to solve their problems;
- upgrading their knowledge and transferring this to students without having to wait for the new edition of the content to be printed and then distributed;
- transforming them into content developers able to generate their own materials according to the specific requirements of the learners they serve by using local languages and examples that are easy for their students to grasp.

The institution will also benefit if teachers start producing educational materials using multimedia because they will be able to develop their own customized content; instructors will be free to modify and update content from time to time according to curriculum requirements with minimum cost; and the teaching quality of the institution will increase. Teachers with ICT skills can also put their content on the Internet and get it peer reviewed. This will ensure that more resources on the Internet are authentic and valid. It will also allow individuals who are not able to get a formal education to access learning resources.

The concept of open educational resources has become well known in Nigeria. Nevertheless, the extent of educators' use of OER and how they were used was not very impressive. This study assessed if there was a the need for continuing professional development of

educators in the use of OER for teaching and learning. It identified the extent to which educators perceived and used OER in teaching and learning, their preferences for and regularity of use of OER tools, level of agreement with relevant OER issues, and their readiness to attend workshops or training on OER.

Data were collected using structured questionnaire items given to a focused group of academic staff from two Nigerian universities at a workshop on course material development for distance learners. The results of the study revealed the need for professional development of educators in the use of OER. The role of continuing professional development for educators in this regard remains clear. There is much to learn from OER in our globalized and digital world in terms of educational provisions; ODL professionals cannot afford to be left out. Hence, the need for continuing professional development for educators to ensure they can effectively use OER in ODL institutions cannot be overemphasized.

## Objectives

The objectives of this study are

1. to identify the participants' knowledge of and experience with OER;
2. to identify the participants' purpose for using OER and the extent of this use;
3. to identify the participants' preferences in OER and how regularly they use OER tools;
4. to identify the participants' levels of agreement with relevant OER issues; and
5. to determine the participants' readiness to attend workshops or training on OER.

## Methods and Procedures

The study used a survey which collected data with a structured questionnaire adapted from an unpublished RETRIDAL (2011) questionnaire on OER used for the National Open University of Nigeria community. The population from which the sample was drawn consisted of academic staff from Ladoke Akintola University of Technology (LAUTECH) in Ogbomoso and the Federal University of Technology (FUTA) in Minna. The sample consisted of twenty academic staff from the two universities directly involved with the development of course materials for distance learners. Out of the 20 participants, 19 responded to the questionnaire items. The 19 respondents consisted of 16 males and 3 females, with ages ranging between 31 and 56 years. They had varied amounts of teaching experience, ranging from 2 to 25 years in tertiary teaching as graduate lecturers in conventional institutions.

The data collected in the questionnaire were analyzed using SPSS 16. The analyses are descriptive, consisting of either a determination of the percentage of responses to items in various sections of the questionnaire, or both a determination of the percentage of responses using various Likert scales and calculations of the mean, standard deviation, and the variance for given items. The cutoff point for the acceptance of responses to research

questions with percentages only was set at 55%. The 55% cutoff point served as benchmark for acceptance of a participant's response to a given item because it is above average and therefore is meaningful. Thus, any response of 55% and above was accepted as favorable. This condition applied to objective 1 and 5. The Likert-type scale was used for objectives 2 to 4. The responses for objective 2 and their weight were *very regularly* (3), *regularly* (2), *occasionally* (1), and *not at all* (0). The boundaries of each response in the 3-point Likert scale from 0 to 3 was calculated by dividing the serial width (3) by the number of responses (4), and was found to be 0.75. This value was used to interpret the mean values. Thus, depending on this calculation, the accepted boundaries for each response to objective 2 are presented below:

$$0 = 0 + 0.75 = 0.75$$

$$1 = 0.75 + 0.75 = 1.5$$

$$2 = 1.5 + 0.75 = \mathbf{2.25}$$

$$3 = 2.25 + 0.75 = 3.0$$

A score of 2.25 and above on the scale was taken as a meaningful indicator of participants' purposes for and the extent of their use of OER. Any score below 2.25 was taken as an indicator of participants' low purposes for and limited extent of use of OER. These values were enough to meet the objectives. However, the variance (V) and standard deviation (SD) were also presented to show how the individual raw scores from which the mean was computed were dispersed (Okonkwo & Ikpe, 2011).

Also, the responses objective 3 and their weights were *regularly* (2), *occasionally* (1), and *not at all* (0). In this case, the boundaries of each response in the resulting 2-point Likert scale (from 0 to 2) was calculated by dividing the serial width (2) by the number of responses (3) and was found to be approximately 0.67. This value was used to interpret the mean values. Thus, depending on this calculation, the accepted boundaries for each response are presented below:

$$0 = 0 + 0.67 = 0.67$$

$$1 = 0.67 + 0.67 = \mathbf{1.34}$$

$$2 = 1.34 + 0.67 = 2.01 = 2.00$$

A score of 1.34 and above on the scale was taken as a meaningful indicator of participants' preference for and regular use of OER tools.

Similarly, for objective 4 responses and weights were *strongly agree* (4), *agree* (3), *disagree* (2), *strongly disagree* (1), and *not applicable* (0). The boundaries of each response in the 4-point Likert scale were calculated by dividing the serial width (4) by the number of responses (5) and was found to be 0.8 (Topkaya, 2010). This value was used to interpret

the mean values. Thus, depending on this calculation, the accepted boundaries for each response are presented below.

$$0 = 0 + 0.8 = 0.8$$

$$1 = 0.8 + 0.8 = 1.6$$

$$2 = 1.6 + 0.8 = \mathbf{2.4}$$

$$3 = 2.4 + 0.8 = 3.2$$

$$4 = 3.2 + 0.8 = 4.0$$

A score of 2.4 and above on the scale was taken as an indicator of participants' moderate agreement with identified OER issues, while 3.2 and above showed strong agreement. Any score below 3.4 was taken as an indicator of low agreement with OER issues.

## Results

The data analyses and results are presented in the tables below. The tables show a summary of the research objectives dealing with the various sections of the study.

Table 1

*Participants' Knowledge and Experience of Open Educational Resources (OER)*

S/No	Knowledge and experience of OER	Yes		No		No re- sponse		N	%	Decision				
		N	%	N	%	N	%							
1	Have used OERs before	12	63.2	6	31.6	1	5.3	19	100.0	Accept				
2	Familiarity with OERs	16	84.2	3	15.8	–	–	19	100.0	Accept				
S/No	Knowledge and experience of OER	High		Moderate		Low		No re- sponse		N	%	Decision		
		N	%	N	%	N	%	N	%					
3	Level of familiarity with OERs	2	10.5	9	47.4	5	26.3	3	15.8	19	100.0	Accept		
S/No	Knowledge and experience of OER	Text-based		Graphics-based		Video-based		All formats		No re- sponse		N	%	Decision
		N	%	N	%	N	%	N	%	N	%			
4	Preferred OER format	7	36.8	2	10.5	2	10.5	7	36.8	1	5.3	19	100.0	Reject
S/No	Knowledge and experience of OER	Excellent		Very good		Good		Average		N	%	Decision		
		N	%	N	%	N	%	N	%					
5	Experience of using OER	2	10.5	2	10.5	5	26.3	2	10.5	19	100.0	Reject		
		Below average		Poor		Not at all		No re- sponse						
		N	%	N	%	N	%	N	%					
		3	15.8	1	5.3	4	21.1	–	–					

Table 1 reveals that the participants have used OER before (63.2%) and they are very familiar with OER (84.2%). Their level of familiarity is also moderately high (high, 10.5%) and (moderate, 47.4%). However, they have not really used the various formats of OER meaningfully, and this is obvious from their described experience of using OER, which was below the acceptable cutoff point, and was therefore rejected.

Table 2

*The Participants' Purpose and Extent of Use of OERs*

S/No	Statement of purpose	Percentage of participants' extent of use of OER				N	$\bar{x}$	SD	V	Decision
		Very regularly	Regularly	Occasionally	Not at all					
1.	Course material development	5.3	5.3	47.4	42.1	19	0.74	0.806	0.649	Reject
2.	Research	10.5	31.6	26.3	31.6	19	1.21	1.032	1.064	Reject
3.	Resources for students	15.8	15.8	42.1	26.3	19	1.21	1.032	1.064	Reject
4.	Lecture notes	10.5	36.8	36.8	15.8	19	1.42	0.902	0.813	Reject
5.	Writing articles and papers	10.5	36.8	26.3	26.3	19	1.32	1.003	1.006	Reject
6.	Developing the curriculum	–	21.1	31.6	47.4	19	0.74	0.806	0.649	Reject
7.	Designing activities for students	5.3	31.6	26.3	36.8	19	1.16	1.259	1.585	Reject
8.	Writing conference papers	5.3	21.1	26.3	47.4	19	0.84	0.958	0.918	Reject
9.	Developing project proposals	5.3	26.3	26.3	42.1	19	0.95	0.970	0.942	Reject
10.	Developing theses	5.3	26.3	15.8	52.6	19	0.84	1.015	1.029	Reject
11.	Helping to understand concepts	15.8	47.4	5.3	31.6	19	1.47	1.124	1.263	Reject
12.	Assessing publications of other scholars	15.8	5.3	42.1	36.8	19	1.00	1.054	1.111	Reject
13.	Aids in assignments	–	36.8	26.3	36.8	19	1.00	0.882	0.778	Reject
14.	Review purposes	5.3	15.8	36.8	42.1	19	0.84	0.898	0.807	Reject
15.	Assessing theses	–	21.1	26.3	52.6	19	0.68	0.820	0.673	Reject

Note. N = Number of respondents;  $\bar{x}$  = Mean; SD = Standard Deviation; and V = Variance.

Table 2 shows that none of the fifteen identified purposes for which educators can use OER in teaching and learning were accepted. All the means were below 2.4, the cutoff point for the acceptability of a meaningful response. Participant responses ranged from 0.68 to 1.42. This implies that OER are not yet part of the educational resources used by these academics. This finding was not what I expected based on the various definitions of OER, which opined that the materials are available for educators to use and reuse for teaching, learning, and research, or can be modified and shared to support education (Creative Commons, 2012; Downes, 2011). This result indicates that the participants have yet to benefit from the advantages of the open educational resources in teaching and learning. If instructors at our dual-mode institutions continue to remain at this current level of awareness about OER and their uses, then the objective of using open and distance learning to achieve Education

for All and the Millennium Development Goals in Nigeria may not be achieved.

Table 3

*Participants' Responses on Preference and Regularity of Use of OER Tools*

S/No	OER tools	Percentage of participants' extent of use of OER tools			N	$\chi^2$	SD	V	Decision
		Regularly	Occasionally	Not at all					
1.	Instructional-based courseware/software	31.6	42.1	26.3	19	1.05	0.780	0.608	Reject
2.	Web pages	84.2	5.3	10.5	19	1.74	0.653	0.427	Reject
3.	Public domain courseware/software	10.5	57.9	31.6	19	0.79	0.631	0.398	Reject
4.	Wikis	42.1	26.3	31.6	19	1.11	0.875	0.766	Reject
5.	Learning object software	26.3	31.6	42.1	19	0.84	0.834	0.696	Reject
6.	Social networks (Facebook, Twitter, blogs, Cloudworks, etc.)	42.1	42.1	15.8	19	1.26	0.733	0.538	Reject

The revelations of Table 3 agree with the earlier observations in Table 2 that Nigerian educators from the dual-mode institutions surveyed in this study have yet to use OER tools as is currently done elsewhere around the globe. Hence, cogent and deliberate action needs to be undertaken urgently to revise this adverse trend in Nigeria's educational system.

Table 4

*Participants' Level of Agreement to Relevant OER Issues*

S/No	Statement of issue	Percentage of participants' level of agreement on OER issues					N	$\bar{x}$	SD	V	Decision
		Strongly agree	Agree	Dis-agree	Strongly disagree	Not applicable					
1.	Your institution will benefit from the use of OER materials	42.1	57.9	–	–	–	19	3.42	0.507	0.257	Accept
2.	Your institution should make study materials available as OER material	31.6	47.4	15.8	–	5.3	19	3.00	1.000	1.000	Accept
3.	Individual staff in your institution should release their books and publications as OER materials	15.8	36.8	36.8	10.5	–	19	2.58	0.902	0.813	Accept
4.	Your institution's staff should have regular workshops on OERs	63.2	31.6	5.3	–	–	19	3.58	0.607	0.368	Accept
5.	There should be more awareness of OER among your institution's staff	68.4	31.6	–	–	–	19	3.68	0.478	0.228	Accept
6.	Your institution should visit OER sites regularly	52.6	36.8	10.5	–	–	19	3.21	1.228	1.509	Accept

Table 4 indicates the participants' levels of agreement with relevant OER issues. All the items included in this section of the questionnaire were accepted as meaningful and relevant. This is not surprising since OER are now the global trend, and Nigerians cannot afford to be left behind. In fact, the surveyed educators also have realized there is a need

for active involvement in the demands of OER. This is observed in their responses, which ranged from 2.58 to 3.68, that is from moderate (item 2 mean = 3.00; item 3 mean = 2.58) to high mean scores (ranging from 3.32 to 3.68).

Table 5

*Participants' Readiness to Attend a Workshop or Training on OERs*

S/No.	Willingness	Yes	%	No	%	Decision
1.	Would you like to attend a workshop or training on OER?	19	100.00	0	0.00	Accept

Table 5 needs no further interpretation. Educators from these tertiary institutions practicing dual mode instruction (both conventional face-to-face and open and distance learning) indicated their forward-looking interest and full grasp of what OER could provide; they indicated their 100% willingness and readiness to receive training on OER. This calls for immediate follow-up action through workshops and seminars to further educate teachers in Nigeria about this topic and to actualize this need as a global issue. This will go a long way to enhancing teaching and learning in our changing environment; the emergence of ICT has repositioned ODL and enhanced it with OER.

## Conclusion

It is obvious that the capacities of our conventional institutions cannot ensure that the learning needs of our young people and adults will be met. Education for All (EFA) and the Millennium Development Goals (MDGs) have both placed emphasis on the importance of education to economic prosperity. These have brought about open and distance learning (ODL) in Nigeria, a method of instruction which has received a global acceptance. But ODL is highly dependent on self-directed instructional materials as the backbone for course delivery. So far, the realization of a complete ODL program in Nigeria has been greatly challenged by the untimely production of instructional materials (Okonkwo, 2012). Ameliorating this challenge necessitates continuing professional development for educators in ODL. Indeed, OER and the emergence of ICT in education are playing key roles in repositioning educational provision in higher education, especially in ODL scenarios, since it has come to stay in Nigeria as a viable alternative to conventional systems of education. The ODL approach worldwide depends largely on the deployment of OER and the use of technology to thrive and succeed. Hence, effective and efficient implementation of ODL in Nigeria calls for the professional development of educators, who are the backbone of high-level academic institutions. These personnel are needed for the effective delivery of classes and have been introduced in response to strong social demands for access to higher education. However, the results of this study indicate the following.

- The participants are familiar with OER but have not actually been using them sufficiently and effectively. Hence their experience using OER is below the acceptable cutoff point. Mere familiarity with and casual use of OER is not enough to meet the demands of teaching and learning in our changing environment. Adequate experience in using

OER is necessary to bring about the desired education demanded by an increasing portion of the population.

- The instructors in higher education institutions have yet to use OER for the purposes which they are supposed to serve in teaching and learning in a changing environment.
- The tertiary educators need urgent instruction in the rudiments of OER and even ICT to enable effective OER utilization in line with current global practices.
- The respondents agree that the issues of OER are meaningful and relevant.
- Above all, they had no reservations about taking full advantage of OER provision and indicated a strong interest in relevant workshops and training.

The paper therefore recommends that there should be training programs covering the rudiments of OER and the ICT skills needed for effective implementation of OER for all educators (both those serving in the conventional systems and those in the open and distance learning environment). This can be done with workshops and seminars for practicing professionals, and the program should be deliberately included in the curriculum for students in Nigerian teacher education institutions.

## References

- Alechenu, J. (2012, March 31). 2012 UTME: Only 3 candidates scored above 300 – JAMB. *Punch*. Retrieved from <http://www.punchng.com/news/2012-utme-only-3-candidates-scored-above-300-jamb/>
- Allen, N. H. (2010, September 1–3). *Education for all: Access? Equity? Quality?* Presentation for the Standing Conference of Presidents (SCOP) Policy Forum, Pretoria, South Africa. Retrieved from [http://www.unisa.ac.za/scop2010/docs/education-for-all\\_scop2010.pdf](http://www.unisa.ac.za/scop2010/docs/education-for-all_scop2010.pdf)
- Atkins, D. E., Brown, J. S., & Hammond, A. L. (2007, February). *A review of the open educational resources (OER) movement: Achievements, challenges, and new opportunities* (Report to the William and Flora Hewlett Foundation). Retrieved from <http://www.hewlett.org/uploads/files/ReviewoftheOERMovement.pdf>
- Bloom, D., Canning, D., & Chan, K. (2006, February). *Higher education and economic development in Africa*. Washington, DC: Human Development Sector, Africa Region, The World Bank. Retrieved from <http://www.arp.harvard.edu/AfricaHigherEducation/Reports/BloomAndCanning.pdf>
- Creative Commons (2012). *What is OER?* [Web page]. Retrieved from [http://wiki.creativecommons.org/What\\_is\\_OER%3F](http://wiki.creativecommons.org/What_is_OER%3F)
- Daniel, J. (2011, September 11). GLOBAL: New guidelines for open educational resources. *University World News*. Retrieved from <http://www.universityworldnews.com/article.php?story=20110909190605514>
- D’Antoni, S. (2009, February). Open educational resources: Reviewing initiatives and issues. *Open Learning*, 24(1), 3–10.
- Das, P. (2010, November). Open education resources and community development: Exploring new pathways of knowledge in the field of higher education in Assam. Paper presented at the Sixth Pan-Commonwealth Forum on Open Learning, Kochi, India.
- Downes, S. (2011, July 14). Educational resources: A definition [Web log post]. Retrieved from <http://halfanhour.blogspot.ca/2011/07/open-educational-resources-definition.html>
- Federal Ministry of Education (2002). *Blueprint and implementation plan for the National Open and Distance Learning Programme*, Nigeria.
- Hilton, J., III, Wiley, D., Stein, J., & Johnson, A. (2009). *The four R’s of openness and ALMS analysis: Frameworks for open educational resources*. Retrieved from <https://>

[www.redhat.com/archives/osdc-edu-authors/2011-January/pdf/foziqzY4Mtn.pdf](http://www.redhat.com/archives/osdc-edu-authors/2011-January/pdf/foziqzY4Mtn.pdf)

- Kanwar, A., Kodhandaraman, B., & Umar, A. (2010, November). If content is king, why are OER still uncrowned? A developing world perspective. Paper presented at the Sixth Pan-Commonwealth Forum on Open Learning, Kochi, India.
- Lambert, S. (2004, April 23). *Teachers' pay and conditions: An assessment of recent trends in Africa*. Paris: UNESCO. Retrieved from <http://unesdoc.unesco.org/images/0014/001466/146656e.pdf>
- Leichty, R. (2012). *OER update*. Retrieved from [www.classroom-aid.com](http://www.classroom-aid.com)
- McAndrew, P. (2010). Fostering open educational practices. ICT in teacher education: Policy, open educational resources, and partnerships. *Proceedings of International Conference IITE-2010*, St. Petersburg, Russia (pp. 124–129). Retrieved from <http://unesdoc.unesco.org/images/0019/001936/193658e.pdf>
- NUC (n.d.). *National Universities Commission guidelines for open and distance learning in Nigerian Universities*. Abuja, Nigeria: National Universities Commission.
- Okonkwo, C. A. (2012). Assessment of challenges in developing self-instructional course materials at the National Open University of Nigeria. *The International Review of Research in Open and Distance Learning*, 13(2), 221–230.
- Okonkwo, C. A., & Ikpe, A. (2011). Professional development of Science Educators through effective collaboration. *Journal of Science Teachers Association of Nigeria*, 46(2), 108–118.
- Organization for Economic Co-operation and Development (OECD) (2007). *Giving knowledge for free: The emergence of open educational resources*. Paris: Centre for Educational Research and Innovation, OECD.
- Plotkin, H. (2010). *Free to learn: An open educational resources policy development guidebook for community college governance officials*. San Francisco, CA: Creative Commons. Retrieved from <http://wiki.creativecommons.org/images/6/67/FreetoLearnGuide.pdf>
- Polgreen, L. (2012, January 10). Fatal stampede in South Africa points up university crisis. *The New York Times*. Retrieved from <http://www.nytimes.com/2012/01/11/world/africa/stampede-highlights-crisis-at-south-african-universities.html?hp>
- Prozonic, C. (2011, December 31). A Fulbright student seeks a greater voice. *Lehigh University News*. Retrieved from <http://www4.lehigh.edu/news/newsarticle.aspx?Channels/News:+2011WorkflowItemID=3bd2592b-57bc-47c9-9952-73617e95693e>

- RETRIDAL (2011). Questionnaire on Open Education Resources used by RETRIDAL for National Open University of Nigeria community.
- Topkaya, E. Z. (2010). Pre-service English language teachers' perceptions of computer self-efficacy and general self-efficacy. *The Turkish Online Journal of Educational Technology*, 9(1), 143–156.
- UNESCO (2011). *Global education digest: Comparing education statistics across the world*. Montreal, QC: Institute for Statistics of the United Nations Educational, Scientific, and Cultural Organization. Retrieved from [http://www.uis.unesco.org/Library/Documents/global\\_education\\_digest\\_2011\\_en.pdf](http://www.uis.unesco.org/Library/Documents/global_education_digest_2011_en.pdf)
- United Nations (1948). *Universal Declaration of Human Rights*. New York, NY: Author. Retrieved from <http://www.un.org/en/documents/udhr/>
- United Nations. (2009). *The Millennium Development Goals report 2009*. New York, NY: Author. Retrieved from [http://www.un.org/millenniumgoals/pdf/MDG\\_Report\\_2009\\_ENG.pdf](http://www.un.org/millenniumgoals/pdf/MDG_Report_2009_ENG.pdf)
- Wiley, D. (2009, November 16). Defining open. [Web log post]. Retrieved from <http://opencontent.org/blog/archives/1123>
- World Bank. (2010). *Directions in development: Human development—Financing higher education in Africa*. Washington, DC: The World Bank. Retrieved from [http://siteresources.worldbank.org/EDUCATION/Resources/278200-1099079877269/Financing\\_higher\\_edu\\_Africa.pdf](http://siteresources.worldbank.org/EDUCATION/Resources/278200-1099079877269/Financing_higher_edu_Africa.pdf)
- Wright, C. R., & Reju, S. A. (2012). Developing and deploying OERs in sub-Saharan Africa: Building on the present. *The International Review of Research in Open and Distance Learning*, 13(2), 181–220.

Athabasca University 



## Leadership, Personal Transformation, and Management



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*Tomorrow's leaders need to be capable of handling dynamic agendas of possibilities and see the future as discoverable rather than predictable. (Latchem & Hanna, 2001, p. 60)*

Definitions of leadership abound! For the purposes of this discussion, we use Secretan's (2004) work which provides a perspective on how leadership should impact on other people, and identifies the need to inspire, not simply motivate:

Thus, the principle purpose of the leader is to act as the main source of inspiration, personal development, support, and guidance for the principal customers of the leader – those who are followers. Otherwise, the role of the leader becomes superfluous since most followers know more about their work, goals, technologies, desired outcomes, and professional expertise than anyone who may be *leading* them. (p. 22)

What makes a person a leader? Is it simply an assigned authority or appointment of position that establishes organizational or hierarchical power over others? Is it a set of personality traits and aptitudes that create a capacity for one to lead and others to follow? Is it a unique ability to conceive ideas and inspire others with thought or actions that impart change in those that hear and act on the “message?” The answer to all of these questions can be “yes,” which creates a particular challenge: In trying to understand and define “leadership” as a personal competency, the definition of a “leader” may be a potential distraction more than a useful descriptor. If one makes a concerted effort to establish a relationship between the concepts of leaders and leadership, the two ideas can be mutually supporting, but not so clearly linked.

The more one examines modern ideas about “leadership,” the more it seems that most are simply techniques to support good person management, in essence, simply lessons on how to be a good leader from an organizational or hierarchical perspective. We submit that “true” leadership is best defined in the outcomes that are achieved rather than the inputs applied, which in turn leads to a singular critical learning: Leadership without personal transformation is simply different forms of management. What follows is a comparison and contrasting of different aspects of both leadership and management and an exploration of what this new perspective means to leaders in education innovation.

## Blurred Lines Between Leading and Managing

Like many philosophical concepts, “leadership” is one that can mean many things to many people; this is perhaps best reflected in the current multitude of leadership theories and approaches applied to the subject. In the context of distance education, Beaudoin (2007) writes:

For the purpose of this appraisal, leadership in distance education, as distinct from managerial functions in a variety of settings, is defined as a set of attitudes and behaviours which create conditions for innovative change, which enable individuals and organizations to share a vision and move in its direction, and which contribute to the operationalization of ideas that advance distance education initiatives. (p. 391)

In this passage, Beaudoin strives to establish a separation between leadership and management functions, and yet fails to do so convincingly; he essentially describes leadership as a series of inputs that creates conditions to achieve an operational or organizational objective. Consider this passage from Zaleznik’s (1992) seminal work contrasting managers and leaders:

Managers tend to view work as an enabling process involving some combination of people and ideas

interacting to establish strategies and make decisions. They help the process along by calculating the interests in opposition, planning when controversial issues should surface, and reducing tensions. In this enabling process, managers' tactics appear flexible: on one hand, they negotiate and bargain; on the other, they use rewards, punishments, and other forms of coercion. (p. 63)

On the surface, this type of leading/managing can be seen from a behaviourist teaching/learning perspective as having the "leader" provide strengthening and weakening influences in order to have the "follower" conform to a desired idea or activity. This type of approach would align very well with the concept of "transactional leadership," which involves motivating and directing followers primarily through appealing to their own self-interest, and the main goal of the follower is to obey the instructions of the leader (Management Study Guide, 2012).

It can, therefore, be considered that from an operational perspective, leaders and managers have similar goals and simply different ways to achieve them. Zaleznik (1992) provides his distinction in this regard:

To get people to accept solutions to problems, managers continually need to coordinate opposing views... Managers aim to shift balances of power toward solutions acceptable among compromising values. Leaders work in the opposite direction. Where managers act to limit choices, leaders develop fresh approaches to long-standing problems and open issues to new options. To be effective, leaders must project their ideas onto images that excite people and only then develop choices that give those images substance. (p. 65)

This is a subtle distinction: It still implies direct external influences in both cases, whether coercion on the part of the manager or motivation on the part of the leader. Ultimately, it remains a behaviourist exercise in shaping the follower's behavior through external influences and feedback. The passage cited from Zaleznik (1992) below perhaps underscores the complexity of differentiation; while acknowledging a key difference between leaders and managers, "leadership" is viewed as simply a technique to achieve one's ends.

Leadership is simply a practical effort to direct affairs; and to fulfill his or her task, a manager requires that many people operate efficiently at different levels of status and responsibility. It takes neither genius nor heroism to be a manager, but rather persistence, tough-mindedness, hard work, intelligence, analytical ability, and perhaps most important, tolerance and goodwill... (p. 63)

## Different Types of People, Different Types of Intelligences

If a leader is considered a person with certain motivations, attributes, and behaviours, then trait-based leadership must be considered. Trait-based leadership theories assume that people exhibit qualities and traits that make them suited to leadership roles. Trait theories often identify particular personality or behavioral characteristics shared by leaders (Gill, 2006). As a result, leadership training is often focused on developing skills and attributes associated with exemplar leaders of reference, with the expectation that these elements can be equally recreated within learners. Gill (2006) proposed a model with four dimensions to leadership: intellectual or cognitive, emotional, spiritual, and behavioural. He suggests that these dimensions are forms of intelligence that underlie an integrative, holistic model of effective leadership (p. 64). He further provides that effective leadership entails the following defining functions (pp. 91-92):

- **Vision and mission.** Effective leaders define and communicate a meaningful and attractive vision of the future and a mission or purpose through which the organization will pursue it
- **Shared values.** Effective leaders identify, display, and reinforce values that support the vision and mission and that followers share
- **Strategy.** Effective leaders develop, get commitment to, and ensure the implementation of rational strategies that enable people to pursue the vision and mission and that reflect the values they share
- **Empowerment.** Effective leaders empower people to be *able to do* what needs to be done
- **Influence, motivation, and inspiration.** Effective leaders influence, motivate, and inspire people to *want to do* what needs to be done

While his model has some merit, there are two key shortcomings. First, there is little distinction provided that would define these functions as “leadership-based” versus “management-based;” they appear to be practical approaches to achieve organizational goals and objectives, which aligns with the management concepts described earlier. Secondly, and more importantly, the consideration of these dimensions of leadership as “intelligences” creates a significant potential barrier when considering leader or leadership development as intelligence cannot necessarily be created through training and development.

Gill’s leadership intelligences could easily be associated with Gardner’s (2006) interpersonal intelligence as a component of one’s ability to interact with others. The challenge in this case is that the theory of multiple intelligences speaks to a biological affinity to these intelligences that is not practically transferrable. In consideration of multiple intelligence theory, Christensen (2008) notes that Gardner’s research shows that although most people have some capacity in each of the intelligences, most people excel in only two or three of them (p. 28). This would suggest that a belief that anyone can be taught to be an exceptional leader

is perhaps naïve; in the same way that teaching others how Wayne Gretzky played hockey will not provide the learners with his level of skill and ability, so, too, teaching others about the traits and methods of great leaders will not provide learners the innate capacity to become leaders of high calibre. That is not to suggest that there is not value in emulating these great leaders, but simply that following their lessons may have limited results.

Secretan (2004) recounts a story of Gandhi that illustrates this point:

One day when Mahatma Gandhi was on a train pulling out of the station, a European reporter running alongside his compartment asked him, “Do you have a message I can take back to my people?” It was a day of silence for Gandhi, part of his regular practice, so he didn’t reply. Instead he scribbled a few words on a piece of paper and passed it to the journalist: “My life is my message.” (p. 67)

While many have followed the teachings of Gandhi, and emulated his traits, there have been few who effectively recreate the value of his leadership message.

## Multiple Leadership Theories, Multiple Parallel Rabbit Holes

Numerous other theories seek to explain leadership by modelling the interactions between leaders and followers. *Contingency/situational leadership theories* focus on particular variables related to the environment that might determine which particular style of leadership is best suited for the situation. *Leader–member exchange theory* conceptualizes leadership as a process of interactions between leader and follower and centers on the dyadic exchange relationships between both (Winkler, 2010). *Complexity theories of leadership* use systems theory to derive models that help define dynamics of leaders, leadership, and the nature of interactions and interdependencies within an organization or situation (Uhl-Bien, Marion, & McKelvey, 2007).

Each of these theories speaks to input activities that shape the short-term actions of the followers; in many ways, they are simply other forms of interpersonal transaction models that seek to align a follower’s immediate actions with a leader’s wishes. If the outputs of these actions remain predominantly short-term behavioural responses, then all of these “leadership” approaches appear limited to external influences, and as such are simply generating managerial outputs.

In an educational context, Bates (2000) notes that while the senior management team is responsible to develop a vision and plan for their institution as a whole, providing a draft vision and undertaking an extensive internal consultation process can be an effective strategy to initiate stakeholder input, acceptance, and support. As with the previous passage, this appeared to be sound advice within the context of collective, shared, or distributed leadership.

However, now consider this counter perspective from Secretan (2004), which provides an interesting commentary on the functions of leadership and management:

Another contemporary myth about vision crafting is that it should be a shared idea, thus reducing the risk of others failing to buy into it. As a consequence, missions and visions that were once extraordinary ideas are adapted, modified, and pummeled until their fire and passion have been squeezed out of them. These “consensus” missions and visions reach for the lowest common denominator where an accord can be built – egalitarian and democratic no doubt, but soulless and lacking in magic. In other words, they suffer from a fatal flaw – compromise – and this leads to mediocrity. (p. 68)

Clearly his view of the leadership function is foundationally different from the management functions of what he refers to as “old story leadership models” (pp. 19-20). He contends that this is a mechanical model based on leadership concepts that seek to manipulate, control, and exploit the personalities of followers. Using Zaleznik’s (1992) premise that “leadership is simply a practical effort to direct affairs,” it can be seen that the leadership functions within this “old story” model support management outcomes – and are not well aligned with the essence of “true” leadership.

## A Transformative View of Leadership

Gardner (2011) provides a different definition of “leaders” based on what can be seen as an output effect on other people (as opposed to management, which has an output effect on tasks, projects, and organizations): “Persons who, by word and/or personal example, markedly influence the behaviours, thoughts, and/or feelings of a significant number of their fellow human beings (here termed *followers* or *audience members*)” (p. 8).

Gardner (2011, p. 10) also provides three magnitudes of leaders observed within this continuum:

- The ordinary leader, by definition the most common one, who simply relates the traditional story of his or her group as effectively as possible;
- The innovative leader, who takes a story that has been latent in the population, or among the members of his or her chosen domain, and brings new attention or a fresh twist to the story;
- The visionary leader, who is deemed by far the rarest individual leader. Not content to relate a current story or to reactivate a story drawn from a remote or recent past, this individual actually creates a new story, one not known to most individuals before, and achieves at least a measure of success in conveying the story effectively to others.

This hierarchy suggests that “true” leaders can therefore be defined based on their ability to impart personal change in others, and measures of their leadership could be determined by considering multiple variables.

The key distinction that supports this transformative view of leadership is that actions are written as a description of outcomes for the followers, and are not based directly on the perspective of the leader or manager (as opposed to Gill’s 2006 framework provided earlier, which appears to be written as leader-based outcomes). This “follower-centric” approach reflects ideals also associated with “servant leadership,” where leadership is seen as a serving relationship with others that inspires their growth (Secretan, 2004, p. 152) as opposed to the traditional role of followers serving the needs of their leader(s). Kotter (2001) also provides support to the idea of fostering intrinsic inspiration and personal drive as opposed to simply providing external motivation:

For some of the same reasons that control is so central to management, highly motivated or inspired behaviour is almost irrelevant... Leadership is different. Achieving grand visions always requires a burst of energy. Motivation and inspiration energize people, not by pushing them in the right direction as control mechanisms, but by satisfying basic human needs for achievement, a sense of belonging, recognition, self-esteem, and feeling of control over one’s life, and the ability to live up to one’s ideals. (p. 68)

The transformative perspective of leaders and leadership tends to create the foundational difference between management and leadership: Management affects outcomes for *efforts*, while leadership affects outcomes for *people*. This critical distinction creates a clear separation between leaders and managers that is reflected in a final perspective from Zaleznik (1992):

Leaders tend to be twice-born personalities, people who feel separate from their environment. They may work in organizations, but they never belong to them. Their sense of who they are does not depend on memberships, work roles, or other social indicators of identity. And that perception of identity may form the theoretical basis for explaining why certain individuals seek opportunities for change. The methods to bring about change may be technological, political, or ideological, but the object is the same: to profoundly alter human, economic, and political relationships. (p. 90)

## Applying Transformative Leadership to Education

A critical problem exists with legacy models and structures for education that is preventing their transformation into contemporary learning models and organizations – the lack of the visionary leadership necessary to create disruptive, transformative, and persistent change. Through an examination of multiple cases, it has become clear that there are numerous social challenges in Canada that could be addressed through education, whether considering public education systems, aboriginal/First Nation education, and even corporate applications. Yet these challenges are tied together by a common theme; in almost every case, it is not a shortage of resources, time, or technology that is holding back change – it is people. As a result, simply improving managerial leadership will have limited impact on innovation; while it may improve outcomes with respect to particular projects or initiatives, it will not create the vision or people-conditions necessary for transformative change. Kotter (1996) states that

Vision plays a key role in producing useful change by helping to direct, align, and inspire actions on the part of large numbers of people. Without an appropriate vision, transformation effort can easily dissolve into a list of confusing, incompatible, and time-consuming projects that go in the wrong direction or nowhere at all. (p. 7)

If there is no grand vision upon which to base change in education, little will happen. The historic segregation of education as a jurisdictional responsibility, whether by province or districts, has fragmented the community into pockets of effort that are largely disconnected from each other, further eroding potential synergies and collaboration necessary to transform. There are few Canadian visionary thought or organizational leaders in the field of education or learning who have been willing to stretch into this space, and there has been a governmental and organizational inertia impeding change (as noted earlier, organizations will not naturally disrupt themselves).

The comparison of multiple leadership theories and perspectives in literature has done little to create a definitive or singular definition of what it takes or means to be a leader. All of the theories and approaches considered have merit in their own right, and cannot be discounted; indeed, it is likely the synthesis of all these inputs that help develop the less-than-fully-tangible competency known as “leadership.” Also true is that leadership effort must be adjusted to fit the needs of a given audience, circumstance, or situation. While leadership as a competency will be employed by both managers and leaders, leadership success will be determined by the people being led, and their individual and collective needs, which will also differ according to audience, circumstance, or situation. The challenge for every leader is to know how best to affect an outcome of effort, an outcome for people, or both, regardless of the situational context.

What, then, does this mean for education innovation? Innovation requires shifts in perspectives and structures – a transformation process. First, leadership as management is

not enough. Second, transformational leadership rests on collaboration and shared purpose, difficult to accomplish in more resistant environments (Garrison & Kanuka, 2004). Third, leaders need to be the innovation they wish to create, and support change: “start with serious self-reflection, understand the change context, and balance passion for change with enlightened self-interest” (Cleveland-Innes, Emes, & Ellard, 2001, p. 25). While striving to emulate great leaders of the past, remember to serve those who follow as well as, if not better than, they serve. Finally, and perhaps above all, remember that in all its forms, leadership without ongoing personal transformation is little more than management.

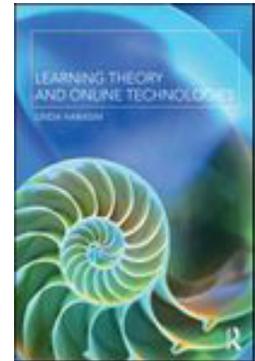
## References

- Bates, A.W. (2000). *Managing technological change: Strategies for college and university leaders*. San Francisco: Jossey-Bass.
- Beaudoin, M.F. (2007). Institutional leadership. In M.G. Moore (Ed.), *Handbook of distance education* (pp. 391-402). New Jersey: Lawrence Erlbaum Associates Publishing.
- Christensen, C.M. (2008). *Disrupting class: How disruptive innovation will change the way the world learns*. New York: McGraw-Hill.
- Cleveland-Innes, M., Emes, C., & Ellard, J. (2001). On being a social change agent in a reluctant collegial environment. *Planning in Higher Education*, 29, 25-33.
- Gardner, H. (2006). *Multiple intelligences: New horizons*. New York: Basic Books.
- Gardner, H. (2011). *Leading minds: An anatomy of leadership*. New York: Basic Books.
- Garrison, D. R., & Kanuka, H. (2004). Blended learning: Uncovering its transformative potential in higher education. *The Internet and Higher Education*, 7(2), 95-105. doi:10.1016/j.iheduc.2004.02.001
- Gill, R. (2006). Redefining leadership: A new model. In *Theory and practice of leadership* (pp. 63-95). London: Sage Productions.
- Kotter, J.P. (1996). *Leading change*. Boston: Harvard Business School Press.
- Kotter, J.P. (2001, December). What leaders really do. *Harvard Business Review*, 85-96.
- Management Study Guide (2012). *Transactional leadership theory*. Retrieved from <http://managementstudyguide.com/transactional-leadership.htm>
- Secretan, L. (2004). *Inspire: What great leaders do*. New Jersey: John Wiley & Sons Inc.
- Uhl-Bien, M., Marion, R., & McKelvey, B. (2007). Complexity leadership theory: Shifting leadership from the industrial age to the knowledge era. *The Leadership Quarterly*, 18(4) pp. 298-318.
- Winkler, I. (2010). *Contemporary leadership theories: Enhancing the understanding of the complexity, subjectivity, and dynamic of leadership*. Heidelberg: Springer.
- Zaleznik, A. (1992). Managers and leaders: Are they different? *Harvard Business Review on Leadership*, 1, 61-89.

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## Book Review - Learning Theory and Online Technologies



**Author: Harasim, L. (2012)**  
New York: Routledge. 208 pages.  
ISBN: 978-0-415-9976-2

**Reviewer: Diane Carver, Old Dominion University, USA**

*Learning Theory and Online Technologies* presents readers with an outline of the current position of online learning, beginning with an historical review of e-learning and learning theories, and proposes a model of e-learning solutions for today's learners. Written by Linda Harasim, professor at Simon Fraser University in Burnaby, British Columbia, the book includes examples of how the online collaborative learning theory can be applied in an online course and provides case studies of how the theory is being implemented in educational institutions.

Harasim begins with an overview of established learning theories and how those various theories relate to technology. Harasim discusses the premise that learning theories reflect the social needs and standards of the time period in which they are developed or gain popularity. Teachers and curriculum designers need to go beyond simply applying the same learning theories and instructional techniques to current technologies and instead must use a new theory to revolutionize education in the 21<sup>st</sup> century.

Chapters 2 through 5 take the reader on a journey back in time to explore historical learning theories. By applying scientific methods and theories to the study of learning, behaviorism challenged the idea that knowledge was metaphysical. Cognitivism brought to light what could not be seen: the inner workings of the mind. Constructivism held that learning was shaped by individuals based on experience, thoughts, and interactions. In each successive chapter, the author discusses these theories and how they emerged from the economic and workforce needs of the era.

In chapters 2-5 Harasim explains how these learning theories relate to the computer age

and points out that each theory is insufficient to capture the essence of the collaborative learning of today. According to Chiong and Jovanovic (2012), earlier learning theories, particularly social constructivism, provide evidence of the benefits of collaborative learning. Harasim summarizes the connections between the high-technology collaboration today and previous learning theories and takes it one step further to develop a new theory for the knowledge age. She refers to this new theory as *online collaborative learning*.

In the most compelling chapter, chapter 6, the author discusses the “Net Generation” from their birth into an online environment to the sheer size of their population, which stands at over two billion individuals. As this generation of learners and employees search for the most efficient way to solve problems and extend their mental capabilities, collaborative learning in the knowledge age is a natural progression. The author stresses the importance of exploration and development of this new learning theory to reflect the unique opportunities and challenges facing education in an online environment. She then describes the online collaborative learning theory for the information age.

Harasim suggests that much like earlier learning theories, online collaborative learning builds upon prior theories while expanding into new directions in response to new societal and educational needs. In particular, invention and adoption of the Internet presented a paradigm shift and created profound consequences for teaching and learning. The creation of knowledge, not just the transmission of knowledge, has become the primary method for learning in today’s collaborative online environment. This construction of knowledge based on shared experiences and interests is similar to the constructivist theory, but the online collaborative learning theory emphasizes cooperation which is not highlighted in the constructivist model.

Harasim believes that online collaborative learning will enhance or contribute to learning activities by “providing a theoretical framework to help design and inform. . .” (p. 92) online instructional practices. The online collaborative learning process involves cooperative learning and construction of knowledge through convergent and divergent thinking, much like group brainstorming. Collection of numerous questions and ideas leads to alternative responses and solutions. These are then filtered and condensed through online collaborative efforts. As one may guess, the need for sophisticated learning technology goes hand-in-hand with development of this theory, and Harasim devotes the end of chapter 6 to a discussion of interactive learning technologies and online content.

Chapter 7 outlines fictional and semifictional scenarios describing online learning through text-based activities, case studies, simulations, student-led presentations, and games. Chapter 8 follows actual case studies through online secondary and postsecondary educational programs that have implemented online collaborative learning methods. In this chapter, Harasim discusses the history, student support structure, faculty training, and learning approaches of several online institutions including those of the University of Phoenix and The Virtual High School.

In chapter 9 Harasim provides examples and discussion pertaining to online communities

of practice which are defined as “groups of people informally bound together by shared expertise and passion for a joint enterprise. . .” (Wenger & Snyder, 2000, p. 139). Examples of communities of practice include the Global Educators Network and Wikipedia. Finally, chapter 10 provides a summary and thoughts for the future.

This book should be required reading for all teachers, not only those who teach online. Many educators tend to work within the parameters of earlier learning theories; changing that paradigm for the knowledge age presents a major shift. The commonality of the previous learning theorists is in their propensity toward individualistic and didactic methods for imparting knowledge from teacher to student. This relatively passive learning process is not consistent with today’s collaborative working and learning environments. Harasim’s online collaborative learning theory contends that knowledge and learning should be shared not only between teacher and student, but also among groups of learners. Harasim ends her book by reminding us that “teachers and learners today have the fortunate opportunity to contribute to and participate in shaping this new online environment, and thereby, most importantly, fully engage in their mission of advancing the conversation of humankind” (p. 174).

## References

- Chiong, R., Jovanovic, J., & Gill, T. G. (2012). Collaborative learning in online study groups: An evolutionary game theory perspective. *Journal of Information Technology Education, 11*, 81-101.
- Harasim, L. (2012). *Learning theory and online technologies*. Marceline, MO: Walsworth Publishing Company.
- Wenger, E.C., & Snyder, W.M. (2000). Communities of practice: The organizational frontier. *Harvard Business Review, 78*(1), 139-145.

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