INTERNATIONAL JOURNAL

OF

INSTRUCTIONAL TECHNOLOGY

AND

DISTANCE LEARNING

PUBLISHER'S DECLARATION

Research and innovation in teaching and learning are prime topics for the *Journal of Instructional Technology and Distance Learning* (ISSN 1550-6908). The Journal was initiated in January 2004 to facilitate communication and collaboration among researchers, innovators, practitioners, and administrators of education and training involving innovative technologies and/or distance learning.

The Journal is monthly, refereed, and global. Intellectual property rights are retained by the author(s) and a Creative Commons Copyright permits replication of articles and eBooks for education related purposes. Publication is managed by DonEl Learning Inc. supported by a host of volunteer editors, referees and production staff that cross national boundaries.

IJITDL is committed to publish significant writings of high academic stature for worldwide distribution to stakeholders in distance learning and technology.

In its first eight years, the Journal logged over eight million page views and one point five million downloads of Acrobat files of monthly journals and eBooks.

Table of Contents – May 2011

Editorial

itdl.org
Donald G. Perrin

For overt 50,000 viewers each month, this Journal provides free and open access to current research in instructional technology and distance learning. There is no membership or mailing list, no fee or sponsor, and no service obligation for members. As a refereed journal, each article must be accepted by at least three "peer" reviewers.

Many loyal readers have expressed a willingness to review articles and / or accept editorial responsibilities. We respect these offers, and there is a plan in preparation to invite all 500+ authors who have published in IJITDL to be peer readers for one to four articles each year. If 3 (and sometimes 4 persons) review 100 articles per year means, approximately 66 of these articles will make it to publication. Needless to say, coordination of the review process is complex and time consuming.

In recent months, the number of papers received has increased and during this period we lost some of our volunteers due to health problems, job loss, and relocation. This is an all-volunteer organization so please bear with us if responses are sometimes slow or if your reply email is lost on the internet. We need technical support to make the system more efficient and reliable.

At the end of the day, we serve a very important function for many authors – support for retention, tenure and promotion (RTP) through publication in a refereed journal. As the only monthly journal in this field, we take this role seriously. We also have to answer questions for authors and RTP committees, and settle occasional disputes related to accuracy, references, and even plagiarism.

As many readers are aware, IJITDL was initiated when the United States Distance Learning Association decided to retire its research journal. We continue to publish distinguished authors and original research from many countries and unsolicited articles continue to arrive via email. We are currently behind in publication and will publish only the Acrobat file of the complete Journal until we catch up. We have over 30 articles approved that will be published over the next 4-6 weeks. Thank you for your patience and support.

Editor's Note: Translating theory into practice is difficult without activity models, concrete examples and a consistent strategy for observing and recording data. Dr. Gardner's observations give strong support for efficacy of Merrill's first principles of instruction to enhance the effectiveness of teaching and learning.

How Award-winning Professors in Higher Education Use Merrill's First Principles of Instruction

Joel L. Gardner
USA

Abstract

There is increasing evidence that using Merrill's First Principles of Instruction as part of an instructional strategy increases learning. However, these principles are written in general terms, and little is written about how these principles function in the real world. Knowing how these principles are currently used in the real world would extend our understanding of the principles and provide insight into how they can be implemented. Therefore, a study was conducted to determine how four award-winning instructors in higher education used First Principles of Instruction in their teaching. The instructors' use of these principles is described and analyzed. In addition to these principles, several additional strategies for providing effective instruction emerged during the study, including instructor enthusiasm, compassion, organization, and expertise. Specific methods for using these principles in higher education are explored, and several important questions regarding the use of First Principles of Instruction are posed, particularly related to the use of real-world problems in instruction. Suggestions for future research and practice are also provided.

Keywords: teaching, higher education, instructional theory, first principles of instruction, instructional principle, learning theory

Note: Names of schools and people in this article are pseudonyms.

Introduction

One current theory of instruction is Merrill's First Principles of Instruction (Merrill, 2002, 2007, 2008), which proposes five foundational principles of instruction which, when used, are proposed to increase student learning. Merrill states the following principles: (1) *Task/Problem-Centered* – learning is increased when instruction is centered on real-world problems or tasks; (2) *Activation* – learning increases when learners recall or demonstrate relevant prior learning and recall or are given a way to organize what they will learn; (3) *Demonstration* – learning increases when learners observe a demonstration in which a similar problem is solved and/or a similar task is performed; (4) *Application* – learning increases when learners apply what they have learned by solving real-world problems and/or performing real-world tasks; (5) *Integration* – learning increases when students reflect on, discuss, debate, or give a presentation on what they have learned (Merrill 2002; 2006). These principles can be converted into a cycle of instructional activities, centered on real-world tasks and problems. See *Figure 1*.
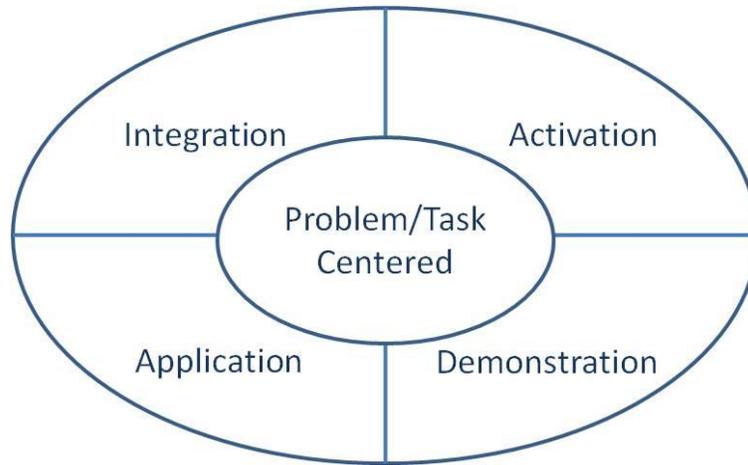
Figure 1. Instruction can follow a cycle of instruction centered on real-world tasks beginning with activation and continuing through integration.

There is some evidence that these principles increase learning. Thomson (2002) reported a study in which an online Excel spreadsheet course using First Principles was compared with a traditional online course teaching Excel. Basing the course on real-world tasks and using the four-phase cycle of instruction caused a 30% student improvement in performance accuracy using Excel, including a 41% improvement in the time taken to complete tasks (p.8). In a separate study, Frick (2009) discovered a significant correlation between student satisfaction with a course and the reported use of First Principles of Instruction. There is also evidence that these principles are supported by various instructional models and theories (Gardner, 2010; Merrill, 2002; Merrill, Barclay, & van Schaak, 2008). In addition, there is some empirical support for the individual principles (Merrill, 2006; Merrill, Barclay, & van Schaak, 2008). Additionally, several authors have described successful instruction that uses First Principles (Collis and Margaryan 2005; Mendenhall, et al., 2006; Gardner, et al. 2008). Growing empirical, theoretical, and anecdotal support for First Principles of Instruction warrants further investigation and understanding of how these principles operate in a live instructional setting.

Study Purpose

Principles are intentionally general and to be used effectively must be tailored to specific contexts, problems and situations (Merrill, 2002; Keller, 2008). Because these principles are written in a general form, it can be difficult to interpret and apply these principles to a real-world setting, and guidance on how to implement these principles is needed (Merrill, 2007). Because effective practice can contribute to and help build theory (http://www.aect.org/), it would be beneficial to study how these principles are used successfully by expert teachers. To date there have been no studies that report how award-winning instructors are using Merrill's First Principles of Instruction in higher education. Therefore, I studied four award-winning professors in higher education with the goal of discovering methods of instruction that adhere to Merrill's First Principles of Instruction. The guiding question in the design of the study is, "How do effective, award-winning instructors at a large western university use Merrill's First Principles of Instruction?"

Method

The study took place at a large western university. To ensure that I studied quality instruction, I selected four professors who had been recognized in previous years as the teachers of the year for the entire university. This recognition is very prestigious and is awarded to one of several

hundred instructors for outstanding teaching at the university. Awardees are experienced instructors who were considered and selected based on the recommendations of their peers and the feedback of past students. It was assumed, and later confirmed, that the instructors selected for this study effectively apply some or all of Merrill's First Principles of Instruction. Potential participants were identified from an online list showing past award winners on the university website. They were contacted twice via email and were asked to participate in the study. Of the winners for the past ten years at university, six replied to my emails. And of the six that replied, four agreed to participate in the study and were included as participants in this study.

The Researcher

An important aspect of my relationship to these instructors was my employment as an instructional designer in the university's center for teaching. In this role, I supported several departments at the university in developing and managing course content in Blackboard Vista, the university's Course Management System. Because I worked directly with professors at the university, I was particularly well-positioned to gather relevant knowledge for this study.

The purpose of this study was to find out how instructors use First Principles of Instruction in higher education. To gain a rich understanding of the instructors' teaching strategies, I followed the advice of Glesne (1992) and gathered data from several sources: an interview with each instructor (which was recorded and later transcribed), an observation of the instructor in a teaching setting, and documents provided by the professor relating to their teaching philosophy and strategy. These documents included course syllabi, student evaluation feedback data, assignment descriptions, peer evaluations, and emails from students. These multiple sources provided triangulation of data for this study.

Data were analyzed using thematic analysis (Glesne, 1992; Gall, Gall & Borg, 2007). I searched for any reference in the sources that referred to the use of any of the five First Principles of Instruction. In addition to themes directly related to First Principles, several other themes and patterns emerged from the data. *Appendix 1* demonstrates the codes and associated themes that emerged during the study. All documents and transcripts were coded according to these themes and were then analyzed and are described in the following section.

Results: Instructors' Use of First Principles of Instruction

This section describes the findings of the data, which were analyzed using thematic analysis and grouped into categories defined by First Principles and other themes that emerged during the study. The instructors included in this study are described to provide context for who was studied. Instructor use of Merrill's First Principles of Instruction is described. Themes that emerged during the analysis but were not specific to First Principles of Instruction are also described. The findings are presented as a description of how the instructors used each principle in the courses. The additional themes are then presented, including examples from each instructor.

Study Participants

Dr. Linda Kelley

Dr. Linda Kelley is a professor in the department of Family, Consumer, and Human Development. She began her career as a kindergarten teacher and has earned graduate degrees in child development. She has worked with small children throughout her career and chose to take a position as a professor and director of a student-teaching preschool lab because her "three favorite populations are parents, little children and college students."

In student evaluations, students described Dr. Kelley as "very approachable and friendly," and "enthusiastic." In the class I observed, she arranged the classroom in a circle and spent time

chatting and laughing with the students before and after the class. Students described the class as "a comfortable conversation where we could discuss anything." The nature of her relationship with students appears to be comfortable and enjoyable to Dr. Kelley and to her students.

Dr. Bretton Wellington

Dr. Bretton Wellington is a professor of Marketing in the School of Business at the university. He began his studies at San Jose State where he earned a bachelor's degree in Marketing. After earning an MBA from Santa Clara University and a Ph. D. in Marketing from Arizona State University, he taught briefly in Arizona and afterward took a position at the university where he has taught for nearly 17 years. Most of his research focuses on the market diffusion of renewable energy and clean technologies. Dr. Wellington has a confident and an engaging personality, and peers in the School of Business who had observed his teaching described him as ""terrific in engaging students," "very animated and energetic," and "enthusiastic." My observation of his teaching style confirms this description, and I found myself drawn into his presentation through his use of dynamic voice inflections and witty humor.

Suzan Harrison

Suzan Harrison is an instructor in the Department of Nutrition and Food Science at the university. She was born and raised in the community surrounding the university and earned a bachelor's and a master's degree from the program at the university. Before taking a position as professor, she worked in many positions in the field of nutrition, including an outpatient dietician at the local hospital, a dietary manager for patients in a nursing home, and even worked with diabetics and clients with eating disorders. After working in a research position at the university, she transitioned from researcher to professor and now manages and organizes all of the undergraduate introductory nutrition courses at USU. Harrison is a pleasure to talk to and many of her students describe her as "very professional," "extremely knowledgeable," and "fun to listen to."

Dr. Pradeep Sumbramony

Dr. Pradeep Sumbramony is a professor in the Department of Economics in the School of Business at the university. He began his education at Calcutta University where he earned a bachelor's degree in Economics. He later earned a PhD in Economics from Chicago University and afterward came to the university as professor. He has taught at the university for over 33 years and has received many awards for excellence in teaching and mentorship. Students described Dr. Sumbramony as "enthusiastic," "very entertaining," and that he showed "genuine care for his students." Dr. Sumbramony had compassion for his students and worked to provide individual guidance and attention to each of his students. One student wrote, "I admire and appreciate (his) effort and love for teaching me."

Instructor Use of First Principles of Instruction

The instructors' use of First Principles of Instruction is described below. Results are presented according to the themes associated with each principle, and discussion of the findings follows the presentation of the findings. It is worth noting that each instructor used all of the principles, including the cycle of instruction. The only exception was that Dr. Kelley was not observed to use the activation principle. Instructors' use of these principles is described briefly below. A more detailed list of how these principles were used is by each instructor can be found in *Appendix 2*.

Problem/Task-Centered

All instructors used some form of real-world problems or tasks in their class. For example, in a child development class, Dr. Kelley directed students to plan out and executing lesson plans in the university pre-school lab. In a marketing class, Dr. Wellington directed students to assume the role of consultants for a real-world company and perform a marketing audit for that company.

And in a nutrition class, Harrison shared real-world, personal examples of the nutrition and development phenomena that she was teaching in lectures and directed students to track and apply nutrition principles to their own lives.

Activation

Most of the instructors also used Activation strategies. For example, when lecturing, Dr. Wellington referred to and built on the knowledge that students had obtained in previous prerequisite courses. In addition, when beginning a lecture, Harrison reviewed what was discussed in the previous class prior to lecturing on new content. And at the beginning of the class period, Dr. Sumbramony asked questions to the students regarding previously learned fundamental principles of economics, slowly progressing to questions about more abstract, complex principles, and finally moved into the content of the current class.

Demonstration

The instructors also used the Demonstration principle in their courses. In Dr. Kelley's child development course, Students learned from other students by observing and evaluating them as they planned out and executed lesson plans in the pre-school lab. In lectures, Dr. Wellington provided his marketing students with many relevant examples from the popular media that illustrate the marketing audit steps to be applied by the students. And Dr. Sumbramony used the chalkboard to work through many examples of how to use a complex equation to solve economics problems on the chalkboard.

Application

The application principle was also used by the instructors. For example, Dr. Kelley's child development students responded to real-world cases during a class discussion. Dr. Wellington's students performed a marketing audit over the course of a semester, including several specific audit-specific activities. And Dr. Sumbramony's students used a complex equation to solve economic problems.

Integration

The Integration principle was also used. For example, after her students worked in a pre-school lab, Dr. Kelley facilitated an in-class discussion with students on their experiences, encouraging them to share insights with one another. Dr. Wellington described to students how the skills they are developing will be useful in the future. And H arrison and Dr. Sumbramony constantly asked their students "What does this mean to you?" and, "Why is this important?"

Cycle of Instruction

In addition to the principles described above, each instructor used a cycle of instruction in their courses. For example, as student groups responded to real-world scenarios (Problem-centered principle) provided by Dr. Kelley in class (Application principle), other students learned from those sharing their responses (Demonstration principle). This was repeated by several groups on several occasions. Dr. Kelley facilitated the discussion by asking questions and also provided feedback and insights to each student group and to the rest of the class on how to improve responses and expand their knowledge related to the scenario.

In another example, when teaching how to solve a difficult economics-related problem (Problem-centered principle), Dr. Sumbramony first worked through the problem using a complex equation on the chalkboard (Demonstration principle). He then presented another similar problem and had students use the equation to solve a portion of the problem. He then gave them another problem to solve on their own for outside of class (Application principle).

Additional Themes

In addition to the instructors' use of Merrill's First Principles of Instruction, several themes emerged as I analyzed the data for this study. This section briefly describe each of these themes.

Enthusiasm

The first theme that emerged was enthusiasm. For example, Dr. Kelley describes herself as enthusiastic about child development, and in course evaluations, students described Dr. Kelley as "enthusiastic and very effective," and that Dr. Kelley had "enthusiasm and love of the subjects we studied." Perhaps this is why one student wrote, "I always look forward to class." I personally found Dr. Kelley to be very engaging and enthusiastic as I interviewed her and observed her class.

Dr. Wellington also exhibited enthusiasm as part of his teaching, and his peers describe him as engaging, energetic and enthusiastic. My observation confirms the presence of enthusiasm in his presentation and communication style, and I thoroughly enjoyed my interview with him. This enthusiasm is related to what Dr. Wellington calls his "stage presence," which he attributes to his experience as an opera performer during his time as a student.

Dr. Sumbramony also had high levels of enthusiasm, and in my interview, I was impressed with his ability to speak with energy and passion. Students also noted this energy, describing him as "energetic," "very passionate," and that his "activity and enthusiasm are astounding."

Knowledgeable

In addition to enthusiasm, students noted that an instructor's knowledge and expertise were important to effective instruction. For example, one student wrote that Dr. Kelley "had the experience and examples to back up what she was teaching." Others wrote that she "really knew the subject matter" and was "well prepared" for class. This perceived knowledge of child development gave her teaching credibility in the eyes of the students. This theme was also found in Suzan Harrison, whose students described her as "very knowledgeable in the subject," and that she "really knows her stuff!"

Organization

Instructor organization was also noted as key to effective teaching. For example, Dr. Wellington mentioned, "I like a lot of structure," and his course syllabus reflects this structure and appears to be very clear and easy to follow. Suzan Harrison also exhibited clear organization, and in our interview, she acknowledged "I work very, very hard and diligently to make sure I'm organized." There are several components to this organization. Harrison's students also appreciated her organization, and wrote that they liked the "learning objectives," and the "outlines." One student appreciated that, "She is consistent with the structure of the class." Harrison's syllabus is also quite organized and provides students with clear structure to the course.

Humor

Humor was another theme that emerged in the study. For example, after observing Dr. Wellington in class, one if his peers wrote "the group laughter which followed (Dr. Wellington's humorous comments) gave evidence of a very positive rapport between teacher and students." Dr. Sumbramony's was also very humorous, and students wrote that they "loved the humor," that "his humor was excellent," and that the class was "entertaining." In the course I observed, Dr. Sumbramony told many jokes and some of the students even made their own jokes during the class. Reflecting on this, Dr. Sumbramony mentioned, "I create a relaxed, enjoyable atmosphere, (even though) we are dealing with difficult, complex things." This relaxed, enjoyable atmosphere seems to facilitate student engagement in the class.

Compassion

Dr. Sumbramony took what he calls a "compassionate approach," and his **compassion** for his students was apparent. He provided them with individual one-on-onetime, even in courses that have over 70 students. In these visits, he guided students through problems and assignments using what he calls the Socratic method, asking questions that guided the students to solving problems on their own. Students greatly appreciated this attention and were impressed with his love and concern for their success. One wrote that "he take(s) an active stance in making sure each of us in his class learned and understood the subject matter." Another appreciated that he "was concerned with each individual student and took time to help anyone who needed it." Perhaps this is why students wrote in their evaluations that "he has been my favorite teacher in the Econ department by far" and that he "should definitely be the teacher of the year." In every class, Dr. Sumbramony sets appointments with students who are struggling and guides them through the content. He even calls students at home if they have missed several classes. This compassion and personal interest in each individual student certainly seems to increase student learning.

Challenging

Another theme that developed was an appreciation of a challenging course. For example, Harrison works to be aware of her students and how they perform in her courses, and she makes sure the course is reasonably difficult for the students, who noted that the challenging course "pushed me to learn more" and "made sure we know exactly what we needed to know."

Discussion

Problem-Centered

Previously, Duffy & Cunningham (1996) noted five ways that problems can be used: (1) the problem as guide; (2) the problem as an integrator or test; (3) the problem as an example; (4) the problem as a vehicle for process; and, (5) the problem as a stimulus for authentic activity. Merrill (2002, 2007) seems to emphasize a gradual transition during an instructional sequence from using problems as *examples* to using the problem as a *vehicle for authentic activity*. In this study, problems were used by the instructors in a similar way- as examples and as vehicles for authentic activity.

However, the size of the problems used varied greatly. For example, as described above, Dr. Kelley directed teams of child development students to respond to parents' complaints that had come up in the past at the school's child care lab. This is a relatively small problem and in class, the discussion for each problem lasted roughly 6-7 minutes. However, the problem of dealing with parent complaints can be seen as one component of the larger task of working with parents, which is a component of the larger task of working as a child care professional. So, which of these is a whole task or problem? The question is important because the use of at least 3 whole tasks is described as vital to task-centered course (Merrill, 2009). But if the task or problem is so large that three tasks cannot be included within the constraints of a single course, then what should be done? How big should a problem be in problem-centered instruction?

An example of a very large whole problem or task is a market audit, which Dr. Wellington's marketing students perform. This problem is performed over the course of the semester because the market audit is so large that there is not enough time to work through multiple whole tasks. Interestingly, Wellington appears to use the cycle of instruction for each *component* of this whole task, providing demonstrations and examples from current media and giving students feedback on their application of each component. So, are these components of a market audit several whole tasks in the course, or is the market audit? One could argue that the whole task of "working as a marketing associate" is taught over the course of a curriculum, and that the components

associated with that task are taught throughout the curriculum. In both scenarios First Principles are used and a whole task is performed by the students.

Perhaps the examples described above provide methods for implementing tasks in a real-world context. Dr. Kelley used small whole problems (responses to pre-school cases) which included student application, peer-peer demonstration, and instructor feedback and guidance, many times throughout the course. However, in the pre-school lab, she used much larger whole problems (student-generated lesson plans) which also included students application, peer-peer demonstration and feedback and guidance. I would designate each of these as whole tasks of different sizes, adapted to the context of the specific context in which the design takes place.

By nature, whole problems or tasks are components of larger tasks, and selecting the appropriate "problem" must fit the constraints of the instructional context and be tailored to the needs and prior knowledge of the students who will receive the instruction. However, there is little guidance on how this can be effectively done, and much is left to the instructor to determine how large the task should be based on the instructional context.

Activation

Three of the instructors in this study used activation strategies to varying degrees. However, some of these strategies were more passive in nature. For example, Merrill wrote that learning is promoted "when learners are directed to recall, relate, describe, or apply knowledge from relevant past experience" (p. 46). This statement implies active participation by the students. However, two of the three instructors who used activation in this study employed more passive strategies by verbally reviewing previously learned materials at the beginning of a class or during lecture. Dr. Sumbramony, did use an interesting active strategy for activating student prior learning. As noted above, this strategy included asking questions to activate the graduate students' prior knowledge. His questions began very basic and gradually became more complex and abstract, finally moving into the content of the course. This strategy appeared to allow the students to see the relationship between the more fundamental principles of economics and the complex content being taught in the course.

Cycle of Instruction

One interesting finding was the instructors' use of a cycle of instruction including demonstration of multiple whole task or problems and student applications of those whole tasks. Interestingly, these cycles of instruction varied from course to course and from task to task. Cycles of instruction varied from several cycles within a 50-minute class to cycles lasting several days. These cycles appeared to change based on the size of the whole task or problem on which the instruction was centered- the larger the task or problem, the longer the cycle appeared to take. This seems to confirm the flexibility of these principles and the potential to adapt them to specific needs and contexts.

I was impressed with how these professors use these principles of instruction seamlessly in their teaching strategies. Instructors move between the phases of activation, demonstration, application and integration fluidly many times during a single class. This fluidity highlights the dynamic nature of these principles and provides examples of how to integrate them effectively in a course.

Additional Themes

The additional themes that emerged during the study provide great insight into how excellent teachers personalize their instruction while naturally implementing First Principles. Many of these additional characteristics and techniques appear to fit with what Keller (2008) has called First Principles of Motivation, which he based on the ARCS model of motivation (Keller, 1987). These principles are designed to increase student motivation to learn, and the instructors in this

study clearly used several of the components outlined. The professors gain and maintain students' **Attention** through the use of humor and enthusiastic teaching. They instill **Confidence** of success in their students by challenging them and giving them compassionate guidance in their studies. They also provide real-world experiences that give students satisfaction of **Success** (Keller, 2008, p. 176-178).

These characteristics and techniques seem to act as facilitators of effective instruction based on First Principles. First Principles alone would not appear to be as effective as First Principles with these facilitating principles. *Figure 2* highlights how these principles appear to work as facilitators of First Principles.
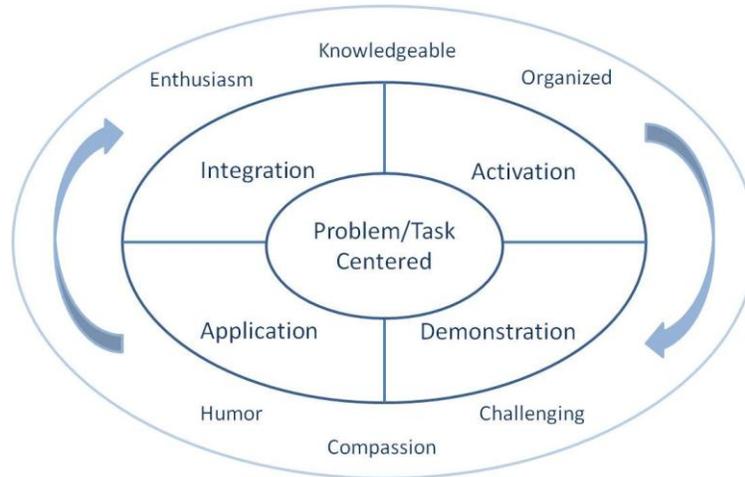
Figure 2. The additional themes identified in this study appear to facilitate student movement through the phases of instruction.

This study confirms the existence of First Principles of Instruction and links the use of these principles to high quality instruction. It is worth noting that these principles were used by teachers in content areas that are very different in nature. The presence of these principles in several different settings in higher education highlights the ubiquitous nature of First Principles and shows that they can be present and utilized, "regardless of program or practice" (Merrill, 2002, p. 43). This study also suggests that recognized instructors naturally employ both principles of instruction and principles of motivation in their teaching.

This study has discovered two things. First, it confirms the existence and use of First Principles of Instruction and links their use to effective instruction in higher education. Second, it emphasizes that the effectiveness of these principles is potentially enhanced through positive motivational strategies and characteristics.

Because principles are general in nature, work must be done to "examine the specific problems and best practices that can be applied in a given situation (Keller, 2008, p. 175)." Therefore, future studies should identify how First Principles of Instruction function in specific learning contexts. For example, work should be done to identify how First Principles of Instruction are used in an online environment in higher education. Future research should also study the interaction between First Principles of Instruction and First Principles of Motivation in a variety of settings. Identifying how these motivational and instructional principles interact can give us greater insight into designing effective and motivating instruction in many environments, contexts.

Conclusion

To bring life to Merrill's First Principles of Instruction, we should observe how they are used in real settings. This study provides some insight into how these principles can function in higher education. To advance as a field, we should be willing to analyze how theory functions in realistic settings and discover methods for using and personalizing instructional theories like First Principles of Instruction so that they can be made more accessible to teachers and instructional designers in many settings.

References

Association for Educational Communication and Technology, (2009).Knowledge Base. Retrieved April 25, 2009 from http://www.aect.org/default.asp.

Collis, B., & Margaryan, A. (2005). Merrill plus: Blending corporate strategy and instructional design. *Educational Technology, 45*(3), 54-58.

Duffy, T. M., & Cunningham, D. J. (1996). Constructivism: Implications for the design and delivery of instruction. In D. Jonassen (Ed.), Handbook of research for educational communications and technology (pp. 170-198). New York: Macmillan.Frick, T., Chadha, R., Watson, C., Wang, Y., Green, P. (2009). College student perceptions of teaching and learning quality. *Educational Technology Research and Development*, 57(5), 705-720.

Gall, M. D., Gall, J. P., & Borg, W. R. (2007). Educational research: An introduction.

Boston, MA: Pearson/Allyn & Bacon.

Gardner, J., & Jeon, T. K. (2009). Creating task-centered instruction for web-based instruction: Obstacles and solutions. *Journal of Educational Technology Systems*, (38)1, pp. 21-34.

Glesne, C., & Peshkin, A. (1992). Becoming qualitative researchers. New York: Longman.

Keller, J. M. (1987a). Development and use of the ARCS model of instructional design. Journal of Instructional Development, 10(3), 2–10.Keller, J. M. (2008). First principles of motivation to learn and e3-learning. Distance Education, 29(2), 175-185.

Mendenhall, A., Buhanan, C. W., Suhaka, M., Mills, G., Gibson, G. V., & Merrill, M. D. (2006). A task-centered approach to entrepreneurship. *TechTrends, 50*(4), 84-89.

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

Merrill, M. D. (2007). First principles of instruction: a synthesis. In R. A. Reiser & J. V. Dempsey (Eds.), Trends and Issues in Instructional Design and Technology, 2nd Edition (Vol. 2, pp. 62-71). Upper Saddle River, NJ: Merrill/Prentice Hall.

Merrill, M. D. 2008. One page summary of First Principles of Instruction. http://cito.byuh.edu/merrill/text/papers/FirstPrinciplesSummary.pdf. Accessed July 25, 2008

Merrill, M. D., Barclay, M., & van Schaak, A. (2008). Prescriptive principles for instructional design. In J. M. Spector, M. D. Merrill, J. J. G. van Merriënboer, & M. P. Driscoll (Eds.), Handbook of Research on Educational Communications and Technology (pp. 173-184). New York, NY: Lawrence Erlbaum Associates.

About the Author
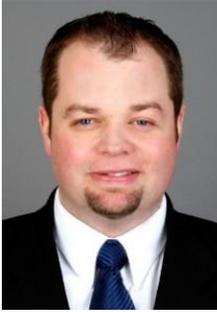
Dr. Joel Gardner is a faculty member at Franklin University in Columbus, Ohio. He has experience working as an instructional designer at multiple institutions in higher education and has also worked as a corporate trainer. Dr. Gardner has spent the last several years researching and applying principles of instructional effectiveness.

joel.l.gardner@gmail.com

Appendix 1

Codes and Themes Identified in Analysis

Code	Theme
P-C	Problem/Task-Centered Principle
Ac	Activation Principle
D	Demonstration Principle
Ap	Application Principle
In	Integration Principle
Enth	Enthusiasm
Kn	Knowledgeable
Org	Organization
Hum	Humor
Comp	Compassion
Chal	Challenging

Appendix 2

Detailed Description of How Merrill's First Principles were Used

Problem/Task-Centered

All instructors used some form of real-world problems or tasks in their class. For example,

Dr. Kelley (Child Development)

In one class, students plan out and executing lesson plans in the university pre-school lab.

In another class, students do home visits to the families of their students, attend parent meetings and conferences and write reports on the meetings.

Students also work in small groups to respond to real world scenarios they might encounter in their work as pre-school teachers.

Dr. Wellington (Marketing)

In one class, students assume the role of consultants for a real-world companies and perform a marketing audit.

Suzan Harrison (Nutrition and Health)

Harrison shared real-world, personal examples of the nutrition and development phenomena that she was teaching in lectures.

Harrison embodied a personal example of excellent fitness and nutrition, as noted by her students.

In one class, students used what they had learned by analyzing the contents of infant formula to see how well it matched important research knowledge.

Dr. Sumbramony (Economics)

Students solved economics problems using complex equations.

Activation

Dr. Wellington (Marketing)

When lecturing, he created an itinerary on the board that organized the class.

Referred to and built on the knowledge obtained in previous prerequisite courses.

Suzan Harrison (Nutrition and Health)

When beginning a lecture, she reviewed what was discussed in the previous class prior to lecturing on new content.

She then previewed the key points of the day's lecture, providing an organizing structure for the content to be learned.

Dr. Sumbramony (Economics)

At beginning of the class period he asked questions to the students regarding more fundamental principles of economics, slowly progressing to questions about more abstract, complex principles, and finally moved into the content of the current class.

Demonstration

Dr. Kelley (Child Development)

Students learned from other students by observing and evaluating them as they planned out and executed lesson plans in the pre-school lab.

Students listened to how other students responded to real world scenarios provided by Dr. Kelley, and also listened to Dr. Kelley's feedback on their responses.

Dr. Wellington (Marketing)

Students were given access to several high quality marketing audits performed by students in previous semesters.

Dr. Wellington provided many relevant examples from the popular media that illustrate the marketing audit steps to be applied by the students.

Suzan Harrison (Nutrition and Health)

Shared personal examples from her life of the nutrition phenomena and human development concepts presented in the lecture.

Provided a personal example of excellent fitness and nutrition to her students.

Dr. Sumbramony (Economics)

Showed and worked through an example of how to use an equation to solve an economics problem on the chalkboard.

Application

Dr. Kelley (Child Development)

Students planned out and executed lesson plans at the pre-school lab.

Students responded to real world scenarios provided by Dr. Kelley.

Dr. Wellington (Marketing)

Students performed a marketing audit, including several specific audit-specific activities.

Suzan Harrison (Nutrition and Health)

Students went to the grocery store and analyzed the contents of infant formula to see how it matched what was discussed in class.

Students tracked their own nutritional intake and compared it with what they had learned in class.

Dr. Sumbramony (Economics)

Students used a complex equation solved an economic problem in class and then used the equation to solve a similar problem on their own out of class.

Integration

Dr. Kelley (Child Development)

Dr. Kelley facilitated an in-class discussion with students on their experiences in the lab in which students shared insights with one another.

Dr. Wellington (Marketing)

Facilitated interactive class discussions by posing engaging and sometimes off-beat questions to help students to expand their knowledge of the subject.

Described to students how the skills they are developing will be useful in the future.

Suzan Harrison (Nutrition and Health)

Constantly asked students, "What does this mean to you?"

Dr. Sumbramony (Economics)

On several occasions asked students, "Why is this important?"

Cycle of Instruction

Dr. Kelley (Child Development)

Student groups responded to real-world scenarios provided by Dr. Kelley in class. Other students learned from those sharing their responses while the sharing group applied their knowledge to the scenario. This was repeated by several groups on several occasions. Dr. Kelley facilitated the discussion by asking questions and also provided feedback and insights to each student group and to the rest of the class on how to improve responses and expand their knowledge related to the scenario.

Dr. Wellington (Marketing)

When teaching how to do each of the several specific market analysis tasks, Wellington provided students with multiple examples of the market analysis task, including examples from previous students and examples from the popular media. Students then performed the market analysis task and were later given feedback from Dr. Wellington on how to improve their analysis.

Suzan Harrison (Nutrition and Health)

In one class, Harrison directed students to read a nutritional case as a group and were given a worksheet to guide them through the process of applying their knowledge to solve nutritional problems. They then integrated their knowledge by presenting their solution to other groups. Students also learned from each other in the sharing process. This cycle was repeated several times.

Dr. Sumbramony (Economics)

When teaching how to solve a difficult economics-related problem, Dr. Sumbramony first worked through the problem using a complex equation on the chalkboard. He then presented another similar problem and had students use the equation to solve a portion of the problem. He then gave them another problem to solve on their own for outside of class.

Editor's Note: This is an interesting study of social dynamics in social media and online classrooms that enable students to feel less intimidation and react freely compared to a traditional classroom setting.

Developing Trust and Openness in an Online Environment

Christopher J. Devers
USA

Abstract

Like many innovative educational initiatives, online environments provide potentially unique benefits, as well as costs, and, consequently, they should be studied systematically. This research was a qualitative case study of an online course; the course, therefore, was the unit of analysis. The participants were students in the course "Teaching and Learning about Africa" at a Midwest United States university and at a South African university. Students in the Midwest U.S. and South Africa were able to participate in their native country while interacting with students in the other country. This study explored how trust and openness were developed in an online course. Students described three themes that created trust and openness in the online environment--(a) the way the professor framed the course, (b) the feeling of anonymity online, and (c) the ability to interact using textual communication. Sociocultural theory served as the theoretical framework for the study and was used to guide the interpretation of the findings.

Keywords: online, education, technology, synchronous, trust, openness, community, sociocultural, distance, learning, communication.

Developing Trust and Openness in an Online Environment

Sociocultural theory has always posited a positive relationship between social development and intellectual development. In 1916, for example, one of the early proponents of the sociocultural perspective, John Dewey, argued that true social communication was inevitably educative.

> Not only is social life identical with communication, but all communication (and hence all genuine social life) is educative. To be a recipient of a communication is to have an enlarged and changed experience. One shares in what another has thought and felt and in so far, meagerly or amply, has his own attitude modified. Nor is the one who communicates left unaffected. . . . . To formulate requires getting outside of the specific communications, seeing it as another would see it, considering what points of contact it has with the life of another so that it may be got into such form that he can appreciate its meaning. (Dewey, 1916, p. 6)

Throughout the twentieth and into the twenty-first century, a cadre of sociocultural scholars from array of disciplines and fields of study provided a wealth of empirical evidence to support claims about the impact of social interaction on cognitive development (Rogoff, 1991; Saxe, 1991; Doise, Mugny, & Perret-Clermont, 1975; Wegerif, 1999; Gauvain, 1995; Gauvain, 2001; Psaltis & Duveen, 2007; Psaltis & Duveen, 2006; Garton & Pratt, 2001). Social interaction in the twenty-first century is often quite different than social interaction in the past because it is mediated by new technologies (Grinter & Eldridge, 2001, 2003; Lenhart, Hitlin, & Madden, 2005; Greenhow, Robelia, & Hughes, 2009). Students are now inundated with new mediums of digital communication -- BlackBerry Messenger, Twitter, Facebook, FaceTime, Blogging, etc. As more and more schools embrace communication technologies, as well as the increase of digital bullying, exploring the components that influence trust and openness are critical. This case study explored the components that contributed to trust and openness in a single online course.

Previous research supports the premise that online environments foster trust and openness. Kehrwald (2008) suggests that it is "people" who ultimately dictate the success of the social climate of online environments. Even with the advancements of technology, trust and openness cannot be hard coded into an online setting. The instructor and participants must create a community (Wenger, 1998, 2000) for trust and openness to grow. Within an online community, instructor supported reflection and group reflection have shown to be effective for learning (Kim, Hong, Bonk, & Lim, 2009). The nature of online courses enables instructors to play an active role in group discussions (i.e., synchronous chatting, bulletin boards, etc.), while also supporting self-reflection (i.e., assignments, reading reflections, etc.).

Merryfield (2003) found in her two-year studies of American teachers and cultural consultants that online education offered unique advantages not found in traditional classrooms. Because online education typically does not allow one to visually see other participants, language accents, body language, and other nonverbal cues are removed from the conversation, which increases equity (Collins & Berge, 1995; McComb, 1994; Ruberg & Taylor, 1995) and participation (Johnson, 2006; Hartman, Neuwirth, Kiesler, Cochran, Palmquist, & Zubrow, 1995). Merryfield (2003) coined the phrase "triggers of difference" for these nonverbal interaction cues that are absent in online environments. Void of these clues (Lobel, Neubauer, & Swedburg, 2002), students focus on the issues in the course, without other prejudices influencing the communication (Vrasidas & Zembylas, 2003).

Along with creating an environment where visual cues are void, they also support thoughtful dialogue. Some online education systems are developed around textual communication, which research suggests supports higher order thinking (Lapadat, 2002) and more focused discussion (Sins, Savelsbergh, Joolingen, & Hout-Wolters, 2010). Online environments provide instructors the ability to monitor dialogue. Specifically, they are able help support a more equitable community by providing each student talking time in the course (Citera, 1998). Additionally, textual communication allows students time to think before responding (Beauvois, 1998; Warschauer, 1996).

Digital communication is increasing at an incredible pace. Many universities and some K-12 institutions are rapidly adopting this new form of communication. Given the recent advancements in technology, there is clearly a need for studies that investigate the relationship between computer-mediated communication and trust and openness. In the Education field, studies that focus on the factors that facilitate positive technology-mediated interactions in classroom settings are especially needed. This article reports the results of one such study.

Overview of the Study

The online course took place using WebCT and met synchronously (two students mainly participated asynchronously[1]) one-and-a-half-hours once a week for one semester. During this time, students participated in guided discussion, similar to that of face-to-face communication in an online class chat room. The course was taught by a professor who is originally from South Africa and has done research on the desegregation of public schools in post-apartheid South Africa. The professor was stationed in South Africa while teaching the class. Students from the United States of America were able to participate with other South African students for three sessions. A guest lecturer from South Africa also participated in one session.

---

[1] Due to other obligations, Susan participated in four synchronous discussions and Lucy participated in two synchronous discussions; in the other weeks, they both participated asynchronously.

Methodology

Design

The purpose of this study was to conduct research on online education and to use sociocultural theory (Dewey, 1902, 1915, 1916; Freire, 1970) to interpret the findings. After data was collected and analyzed, it became clear that sociocultural theory fits the phenomena that emerged (Geertz, 1973). This study was an empirical inquiry single descriptive case study (Stake, 1995; Yin, 2003) that examined a single online course. For this project, a descriptive case study analysis (in-depth description of this case) was conducted. Stake (1995) and Yin (2003) describe case study research as an effort to understand a complex phenomenon within the context of real life events.

Participants

The participants in the study included students from two universities--a Midwest United States university and a South African university. Although the majority of the course participants attended the U.S. university, white students did not dominate the class. It was an unusually diverse group compared to the typical courses in a College of Education. The students were from different departments and varied by age, race, and gender. In order to maintain confidentiality, each of the students was assigned a pseudonym.

Students						
Participant	**Gender**	**Race (self-reported)**	**Age**	**Department**	**Degree Seeking**	**Interview**
Laura	F	Black	24	Educational policy studies	MA	In person
Jason	M	White	25	African studies	MA	In person
Brendon	M	African American	33	History	PhD	In person
Susan	F	White	30	Political science	PhD	In person
Elizabeth	F	Asian Indian	21	Global studies in education	PhD	In person
Lucy	F	White	24	Not specified	EdM	Phone
Julie	F	half Mexican, half Caucasian	21	Political science and sociology	BA	In person
Cindy	F	White/non-Hispanic	29	Curriculum and instruction	PhD	In person
Annie	F	South African	21	Natural sciences	BEd	Phone
Felicity	F	South African		Math literacy and biology	BEd	N/A
Professor and Technical Assistant						
Name	**Gender**	**Race**	**Age**	**Department**	**Degree**	
Researcher	M	Caucasian	30	Curriculum and instruction	PhD student	
Professor	M	South African	36	Curriculum and instruction	PhD	

Figure 1. **Participants**

The diverse experiences and viewpoints of the participants cultivated a valuable learning environment (Dewey, 1916).

Data and Data Analysis

Systematic analysis procedures were used to analyze the qualitative data (Guba & Lincoln, 1994). The data for the interview and open-ended questions were coded and analyzed according to emergent themes and categories (Glasser & Strauss, 1967) using Nvivo software.

Semi-structured interviews: Interview data were transcribed from audio recordings, and coded to categories using Nvivo. The codes were then organized to address the two main research questions, creating both emergent themes and subthemes from the coded data.

WebCT class discussion and other online areas (e.g., bulletin boards, etc.): Freire (1970) provided a framework for interpreting data from the online course. Dialogue, critical thinking, and reflection are important components of critical pedagogy (Freire, 1970, pp. 70-72). These concepts were used as analytic criteria for coding and selecting examples in support of categories that emerged from data used for this study.

Individual interviews were conducted using an interview script (Patton, 1987) during the fifth week and at the end of the course. In person interviews were conducted with six of the participants; while the remaining two participant interviews were conducted over the phone. Predetermined interview questions were used for both the fifth week and end of the course interviews. Data were initially coded using the three main categories - cross-cultural, learning and growth, and online. Once the data were coded using these data categories, themes emerged related to the research question (Glasser & Strauss, 1967): What factors contributed to the development of trust and openness?

Results

The interview data reveal three main themes, the "professor's contribution to the course framework," a "feeling of anonymity," and "textual communication" which contributed to creating a trusting and open environment. Additionally, subthemes provided support for each of the overarching themes. One to two student interview responses provided reinforcement for each of the supporting subthemes. Each of the three major theme findings is presented in the sections that follow.

Professor's Contribution to Course Framework

Six out of eight American students' interview data supported the main theme that the professor's contribution to the course created trust and openness. This theme is supported by two subthemes, a "constructive environment" and "supportive dialogue." Overall, the two subthemes provided support for how the professor contributed to creating a trusting and open environment.

Constructive environment.

Brendon described that having the professor set up a constructive environment helped the students be open and accepting of others.

Brendon: you must have an instructor that creates and cultivates that kind of environment, cause if you don't, it can't exist, it's the students in concert, with those are governing and running and shaping the class, it takes two ends for that to happen . . . (Message ID No. M1-Z5-88Q post-course interview)

Laura described how the professor framed the course in a way that contributed to an open environment.

Laura: . . . . at the last session, the professor said "let's just make sure that, we're careful about how we say things, to make sure that we're not attacking each other's ideas but we're just, saying what our opinion is, and so sometimes over, email or chat system, that might not come across as clearly" . . . . (Message ID No. T3-J5-17E fifth week interview)

In the post-course interview, Laura stated:

Laura: I think he did a pretty good job regulating that, in the beginning of the class, I believe he stated that he was trying to foster an environment where everyone felt welcome in this online classroom, where everyone felt comfortable in voicing their opinions on how they felt about certain issues. In a couple of instances, I think that the conversation kind of got a little heated, and I think he did a good job again of quelling the situation and, making sure that we all are being respectful of each other's opinions . . . . I think he did a good job of making sure that we're all not attacking anyone particular, someone might disagree with your idea, and we can voice that and we can discuss that, but it's not personal towards anyone, so, I think he did a good job of doing that. (Message ID No. T3-Z5-44E post-course interview)

In both the fifth week interview and the post-course interview, Laura described how, from the beginning, the professor structured the course in a way that helped cultivate an environment where students felt open and comfortable. Further, she described how, at times, situations became "heated," but the professor kept the conversation controlled.

Supportive dialogue. Cindy described the benefit of having an instructor frame a safe online environment. Specifically she details the value supportive dialogue.

Cindy: . . . I think it's just the way, the instructor was pretty open to talking about just about anything, and even if he disagreed, he'd be like well that's your opinion, I might not agree, but he wasn't like no that's wrong, that's bad, I mean the instructor, you could tell if he might not necessarily have of agreed with what you said, but at least he was open to hearing you out, and letting you say what you thought, and even if he was questioning it, then maybe he would question you a little further, and say okay, I might not still agree with you, but at least I understand where you were coming from, and I think that helped, set the mood for the rest, for the whole class, in that you felt, felt open to say what you thought, because you knew the teacher wasn't going to come down on you . . . (Message ID No. K5-Z5-44P post-course interview)

The professor's comments illustrate Cindy's previous statement, by demonstrating how the professor did not agree with a comment and was nonetheless constructive.

Professor: I like your earlier points, Jason, but I would not agree that "I" and "We" are the same. Thanks for these points...let me move on to others. Who is ready? Thanks Jason! (Message ID No K5-S3-92U chat session transcript)

Having a professor who constantly offered positive feedback throughout the class appeared to have an impact on Cindy's feeling safe. Elizabeth too described that the professor supported dialogue.

Elizabeth: . . . he [the professor] is always giving us positive feedback, after every single one of our contributions, commenting *that was great* or *those are really good points*. I know that definitely helps, because even in a classroom setting, you don't have teachers saying that, like okay let's go to the next person, but they don't say that was a great point, or they don't really take the time to give you that kind of encouragements, I think that having that positive feedback from a teacher is really important. (Message ID No. T3-J5-17W fifth week interview)

The course framework and structure, implemented by the professor, helped create an atmosphere where students felt safe and comfortable sharing their thoughts and personal experiences.

Both tactics, creating constructive environment and providing supportive dialogue, helped establish trust and openness. While online settings offer the absence of "triggers of difference" (Merryfield, 2003), it is still important to be sensitive when interacting online. When difficult topics arose, it was important to remind students to be open to others' viewpoints and to be cautious of how things were said. For example, suggesting that students be sensitive to the exact words that were used and asking students to clarify points they were making, can help foster an open environment. Supportive dialogue also helped cultivate a trusting environment. Even when disagreeing with students, providing encouraging comments proved beneficial. From the first day of class through the end of the semester, creating a constructive environment and providing supportive dialogue contributed to the development of trust and openness.

Feeling of Anonymity

As with the first main theme, six out of eight U.S. students discussed how the online environment provided a sense of anonymity. Students described that since they were unable to visually communicate with one another, they felt anonymous. The feeling of anonymity theme is supported by the subthemes of feeling "hidden" and "free." These two subthemes provided support for the main theme of anonymity.

Hidden. Elizabeth's response described how she felt more open due to the lack of visual triggers associated with online environments.

> **Elizabeth**: I think it in a way might be a good thing, just because we are forced to really think about what they are saying, and you don't make stereotypes or whatever about the way people look and connect that to what they are saying, so maybe in a way, I think it is a beneficial thing, maybe things like the tone would add to the class, but I think that, so far, I feel like everybody's been really good at expressing themselves pretty well, so that definitely helps, I don't feel like I've misunderstood anything, or I really don't feel like I am losing out on anything in the communication by not being able to see the person. (Message ID No. H7-J5-17W fifth week interview)

As a result of feeling hidden, she thought that students were more open than they would have been in a face-to-face course. In a fifth week and post-course interview question, Laura discussed how an online environment contributed to a feeling of anonymity.

> **Laura**: Well, I think people tend to be more honest when they are using online systems simply because you don't have that intimidation of being face-to-face with someone, like you're not looking at the professor per se or you're not looking at the other classmates per se, and so you might be a little more liberal about what you say knowing that people aren't literally staring and focusing in on you visually anyway, I would say that for the most part, I think people are able to be more direct and be more up front about what they want to say without feeling that tension to have to come up with the right words right on the spot to say, I mean you can pretty much think out your comment, type it, spell check it, make sure that it's right before you post it, it's a little bit different feel than being in class. (Message ID No. R2-J5-17E fifth week interview)

In the post-course interview, Laura stated:

> **Laura**: . . . . I think sometimes classes, face-to-face, say a person is shy, or not really an extravert, you know, doesn't really want to participate when other people are looking at them speak, I think the online class is a way for those students to type freely, not necessarily hide behind the screen, but it's a forum where they can kind of voice their

opinion openly without having that intimidation of being in a classroom setting, like, actual physical classroom setting. (Message ID No. R2-Z5-44E post-course interview)

Laura described in both interviews that online environments contributed to her feeling anonymous, since she felt safe hidden behind her computer. A uniqueness of an online environment is the absence of "triggers of difference" (Merryfield, 2003, p. 160) so students do not have to deal with visual communication (e.g., body language, appearance, etc.). Merryfield described triggers of difference as, ". . . visual and oral differences often subconsciously make people uncomfortable or otherwise constrain people's abilities to listen, interact, and learn from others" (p. 160). The online course provided students with the perception of being hidden from others and offered them a sense of freedom, both of which contributed to the feeling of anonymity.

Freedom. Lucy explained how her involvement in the course and the feeling of anonymity contributed to her participating more in class discussions.

Lucy: well obviously it wouldn't be as flexible and honestly, you wouldn't think as a teacher I'd be afraid to talk up and stuff in class, but when there's a big class, with people I'm unfamiliar with, I'm not going to say a whole lot, I'm not going to kind of step out there and say the things that I've been saying in this class, not that they're controversial really, I just wouldn't be speaking up nearly as much and wouldn't be giving my opinion, I'd probably just be sitting there kind of soaking it all up and wouldn't be speaking up as much, since I'm somewhat anonymous on this . . . . nobody is there to look at me like I'm crazy. (Message ID No. R2-J5-54B fifth week interview)

In Lucy's response, she described that she participated more in the online setting, since there was some degree of anonymity from not being seen. Jason also expressed that technology has a way of helping people feel more "comfortable" than if they were in a face-to-face setting.

Jason: I think that the technology has a comfortableness, the technology will have a large part in that, in terms of people, the more comfortable you are chatting, the easier it will be to be extraverted into the class conversation. (Message ID No. T3-J5-12L fifth week interview)

In the fifth week interview, Jason described again how online environment (technology) might allow others to freely participate in the course.

Anonymity seemed to be an important factor in establishing trust. Specifically, providing an environment where students were unable to view visual cues helped them open up within the course (Merryfield, 2003). The online course also appeared to ease the fear of public speaking and allowed students to communicate when otherwise they would not. The textual environment provided a sense of freedom when chatting, which could be due to how prolific textual communication has become over the last few years. Overall, the feeling of anonymity impacted student's perception and ultimately contributed to the development of trust and openness.

Textual Communication

The third main theme, textual communication, was described by six of the eight U.S. students as beneficial in developing trust and openness. The subthemes, "thinking before responding," "open dialogue," and lessening the "language barrier,' all provided support for the main textual communication theme. Overall, textual communication, with support from the three subthemes, contributed to trust and openness.

Thinking before responding. Laura described that some students might be more communicative in an online situation than they would be in a face-to-face course.

Laura: I think people are able to be more direct and be more up front about what they want to say without feeling that tension to have to come up with the right words right on the spot to say, you can pretty much think out your comment, type it, spell check it, make sure that it's right before you post it, it's a little bit different feel than being in class. (Message ID No. R2-J5-17E fifth week interview)

Laura explained that she predicted students would be more forthcoming, due to the use of textual communication, instead of visual communication. During an interview question, Susan suggested that using textual communication provides time to prepare.

Susan: So I think one of the good things about it, is that it gives people kind of a chance to think before they blurt things out, when you are all sitting around in a classroom, I think a lot of times people are kind of scared to talk, because they don't know or there're the talkers and they say too much, and so it helps I think . . . . (Message ID No. U8-J5-51H fifth week interview)

Because students had time to prepare their written response, Susan thought that an online environment offered a place where they would feel at ease contributing to class discussions.

Open dialogue. Below, Laura described her perception of the advantages of textual communication on the course.

Laura: . . . . I think the online class is a way for those students to type freely, not necessarily hide behind the screen, but it's a forum where they can kind of voice their opinion openly without having that intimidation of being in a classroom setting, like, actual physical classroom setting. (Message ID No. R2-Z5-44E post-course interview)

Laura described how the utilization of text for communication provided students with the opportunity to think before responding. In addition, she also explained that students expressed themselves freely using text. Lucy too, expressed how the online environment contributed to students being open in their dialogue.

Lucy: . . . . you weren't going to be sitting there seeing someone, or seeing their face or getting into a verbal argument with them, you could write, you could type whatever you want, and it's not a big deal. (Message ID No. R2-Z5-18B post-course interview)

Both Lucy and Laura described how textual communication provided open dialogue, which contributed to feelings of trust and perceptions of openness.

Language barrier. Below, Laura illustrated how textual communication was beneficial to those who did not speak the language of instruction fluently.

Laura: I think one could potentially be a language barrier, sometimes international students, their English might not be that good, they might know English very well, they probably could type it just as fast as anybody else could, but it doesn't come off the same, because they don't speak it as well, so the online component where we're just typing our answers, it seems like everybody, you know, is pretty much on the same level as far as, speaking and being able to communicate with each other, so in that sense I could see it being more beneficial to have it online. (Message ID No. A4-Z5-44E post-course interview)

Laura recognized that some students found it easier to dialogue using a text based system than speaking as they would in a face-to-face course. The advantage of being able to think before responding contributed to students being open when discussing sensitive topics. Further, students who struggle with the native language used in a course might find it easier to communicate using text.

The online course provided students the opportunity to carefully construct their responses as they dialogued. Giving students the time to carefully construct responses could lead to richer conversations, and cause students to feel more trusting and open. Generally, textual communication is often slower than spoken communication and could be a contributing factor in allowing students more time to construct responses. For students who verbally struggle with language, using a chat system provides them with an alternative communication venue. Overall, a textual dialogue offers some unique advantages that, when utilized well, can promote a trusting and open environment.

Discussion

Developing trust and openness in online settings is challenging (Grabowski & Roberts, 1998). In order to do this, the professor of this online course framed it (Kehrwald, 2008) in ways that cultivated an atmosphere in which students felt open to discuss sensitive topics. The students trusted the professor, as well as the other students in the class. The professor promoted trust and openness (Kling & Courtright, 2004), while encouraging authentic education (Freire, 1970; Kim, Hong, Bonk, & Lim, 2009) and appreciation for diversity. Dewey (1916) stated:

> Lack of the free and equitable intercourse which springs from a variety of shared interests makes intellectual stimulation unbalanced. Diversity of stimulation means novelty, and novelty means challenge to thought. The more activity is restricted to a few definite lines, as it is when there are rigid class lines preventing adequate interplay of experience--the more action tends to become routine . . . . (p. 98)

Students, along with the professor, created an evolving collaborative environment that allowed semi-structured content open to students' interests and current cultural contexts. The professor actively involved the students in creating an authentic educational atmosphere.

These case study findings suggest that a leading factor in developing trust and openness is based on the instructor. On the first day class, it is important for an instructor to set an appropriate tone for the course. One recommendation for online education is to be explicit about student expectations and behavior for the course. For example, the syllabus should have a section regarding online student conduct and those guidelines should be discussed during the first online session. Discussing the expectations will give students an opportunity to resolve any concerns. Additionally, throughout the course, the instructor should also participate and encourage participation in a manner that the supports an inclusive and trusting environment. Specifically, the instructor should be mindful of his/her communication and artfully monitor student communication.

The online environment itself influenced students' feelings of safety partly because of the absence of triggers of differences (Merryfield, 2003). Students described that not being able to see each other contributed to openness and trust. The anonymity created in the online environment (Lobel, Neubauer, & Swedburg, 2002) helped lessen the impact stereotypes that are often triggered by visual and oral communication (Collins & Berge, 1995; McComb, 1994; Ruberg & Taylor, 1995). For example, because students did not see each other, they did not need to be concerned with facial gestures or a lack of facility with English that prejudice in-person interaction.

To help create anonymity at the beginning of the course, the instructor should encourage students to not divulge a lot of revealing personal information. Many modern course management systems allow students to upload pictures to represent an avatar -- when a student posts something online, the avatar (picture) is displayed. During the first few weeks of the course, the instructor should not allow students to upload personal photos, but rather have all the students use the same icon or a few predetermined icons. Further, when students introduce themselves, they should be cautious in reveling stereotypical personal information (i.e., religious beliefs, color, gender, etc). Limiting

pictures and personal information during the first few weeks will provide an opportunity to develop an open and trusting environment, while dampening prejudice. Once the instructor and students have developed a community, students should be encouraged to upload personal pictures and reveal more personal information.

Since the course used textual communication (e.g., chatting, bulletin boards, etc.), students had time to think about a response and sometimes revise the response before posting it for others to see. Textual communication provided time to think before responding (Beauvois, 1998; Warschauer, 1996) and gave less talkative students the opportunity to voice their opinions (Citera, 1998). Students described that using a textual communication system provided the benefit of quality dialogue over quantity. The speed of textual communication was slower than that of auditory communication, but offered students the ability to type out a response, revise, and then post it for others to read (Lapadat, 2002). Harasim's (2000) research had similar results. Like Harasim's (2000) research, the data illustrated that this online course also generated high quality dialogue.

When classes utilize textual communication as the main communication medium, it is important remember that typing is considerably slower than speaking. Nonetheless, rich discussions can still take place. Instructors should remind students to think carefully when answering questions, and to be sure the words that they chose accurately portray their intended meaning. Even though anonymity can be an advantage, not seeing others' facial expressions and voice inflections might make interoperating communication challenging, and therefore great finesse should be used while conducting class discussions.

Similar to Dewey's theory of social influence, the social atmosphere created by the students and the professor in the online environment appeared to have enhanced "the quality of life" in the group. Dewey (1916) theorized that social environments influence the activities and experiences of the persons who participate in the group.

A being whose activities are associated with others has a social environment. What he does and what he can do depends upon the expectations, demands, approvals, and condemnations of others. A being connected with other beings cannot perform his own activities without taking the activities of others into account. (p. 14)

Similarly, the environment of the online course impacted the experience and actions of the students (Gerdes, 2010). Students described that both the professor and the online textual communication cultivated a trusting and open atmosphere.

References

Ambady, N., & Rosenthal, R. (1993). Half a minute: Predicting teacher evaluations from thin slices of nonverbal behavior and physical attractiveness. *Journal of Personality and Social Psychology, 64*, 431–441.

Beauvois, M. H. (1998). Conversations in slow motion: Computer-mediated communication in the foreign language classroom. *Canadian Modern Language Review*, *54*(2), 198-217.

Collins, M., & Berge, Z. (1995). Introduction: Computer-mediated communications and the online classroom in higher education. In Z. L.Berge & M. P.Collins, (Eds.), *Computer mediated communication and the online classroom: Vol. 2. Higher education* (pp. 1-10). New Jersey: Hampton Press.

Citera, M. (1998). Distributed teamwork: The impact of communication media on influence and decision quality. *Journal of American Society for Information Science, 49*(9), 792-800.

Dewey, J. (1902). *The child and the curriculum*. Chicago: University of Chicago Press.

Dewey, J. (1915). *The school and society*. Chicago: The University of Chicago Press.

Dewey, J. (1916). *Democracy and education: An introduction to the philosophy of education*. New York: The Macmillan Company.

Doise, W., Mugny, G., & Perret-Clermont, A. (1975). Social interaction and the development of cognitive operations. *European Journal of Social Psychology*, *5*(3), 367-383.

Freire, P. (1970). *Pedagogy of the oppressed*. New York: Herder & Herder.

Garton, A., & Pratt, C. (2001). Peer assistance in children's problem solving. *British Journal of Developmental Psychology*, *19*(2), 307-318.

Gauvain, M. (1995). Thinking in niches: Sociocultural influences on cognitive development. *Human Development*, *38*(1), 25-45.

Gauvain, M. (2001). Cultural tools, social interaction and the development of thinking. *Human Development*, *44*(2-3), 126-143.

Gee, J. (1998). The new literacy studies and the "social turn". Retrieved August 01, 2007, from http://www.schools.ash.org.au/litweb/page300.html.

Geertz, C. (1973). *The interpretation of cultures*. New York: Basic Books.

Gerdes, A. (2010). Revealing preconditions for trustful collaboration in CSCL. *International Journal of Computer-Supported Collaborative Learning*, *5*(3), 345-353.

Glaser, B., & Strauss, A. (1967). The discovery of grounded theory: Strategies for qualitative research. Chicago: Aldine.

Grabowski, M., & Roberts, K. H. (1998). Risk mitigation in virtual organizations. *Journal of Computer-Mediated Communication*, *3*(4).

Greenhow, C., Robelia, B., & Hughes, J. E. (2009). Web 2.0 and classroom research: What path should we take now? *Educational Researcher*, *38*(4), 246-259.

Grinter, R., & Eldridge, M. (2001). y do tngrs luv 2 txt msg?. In W. Prinz, M. Jarke, Y. Rogers, K. Schmidt, & V. Wulf (Eds.), *Proceedings of the seventh conference on European Conference on Computer Supported Cooperative Work* (pp. 219-238). Norwell, MA: Kluwer Academic Publishers.

Grinter, R., & Eldridge, M. (2003). Wan2tlk?: Everyday text messaging. *Proceedings of the SIGCHI conference on Human factors in computing systems* (p. 441). New York, NY: ACM Press.

Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of Qualitative Research* (pp. 105-117). Thousand Oaks, CA: Sage.

Harasim, L. (2000). Shift happens: online education as a new paradigm in learning. *The Internet and Higher Education, 3*(1-2), 41-61.

Hartman, K., Neuwirth, C. M., Kiesler, S., Cochran, C., Palmquist, M., & Zubrow D. (1995). Patterns of social interaction and learning to write: Some effects of network technologies. In Z. L.Berge & M. P.Collins, (Eds.), *Computer mediated communication and the online classroom: Vol. 2. Higher education* (pp. 47-78). New Jersey: Hampton Press.

Johnson, G. M. (2006). Synchronous and asynchronous text-based CMC in educational contexts: A review of recent research. *TechTrends*, *50*(4), 46-53.

Kehrwald, B. (2008). Understanding social presence in text-based online learning environments. *Distance Education*, *29*(1), 89-106.

Kim, P., Hong, J.-S., Bonk, C., & Lim, G. (2009). Effects of group reflection variations in project-based learning integrated in a Web 2.0 learning space. *Interactive Learning Environments*, 1-17.

Kling, R., & Courtright, C. (2004). Group behaviour and learning in electronic forums: A socio-technical approach. In S. A. Barab, R. Kling, & J. H. Gray (Eds.), *Designing for virtual communities in the service of learning* (pp. 91–120). Cambridge: Cambridge University Press.

Lapadat, J. (2002). Written interaction: A key component in online learning. *Journal of Computer-Mediated Communication 7*(4).

Lenhart, A., Hitlin, P., & Madden, M. (2005). *Teens and technology: Youth are leading the transition to a fully wired and mobile nation*. Washington, DC: Pew Research Center.

Lobel, M., Neubauer, M., & Swedburg, R. (2002). Elements of group interaction in a real-time synchronous online learning-by-doing classroom without F2F participation. *USDLA Journal*, *16*(4).

McComb, M. (1994). Benefits of computer-mediated communication in college courses. *Communication Education*, *43*(2), 159-170.

Merryfield, M. (2003). Like a veil: Cross-cultural experiential learning online. *Contemporary Issues in Technology and Teacher Education, 3*(2), 146-171.

Patton, M. (1987). *How to use qualitative methods in evaluation*. Newbury Park, CA: Sage Publications.

Psaltis, C., & Duveen, G. (2006). Social relations and cognitive development: the influence of conversation type and representations of gender. *European Journal of Social Psychology*, *36*(3), 407-430.

Psaltis, C., & Duveen, G. (2007). Conservation and conversation types: Forms of recognition and cognitive development. *British Journal of Developmental Psychology*, *25*(1), 79-102.

Rogoff, B. (1991). *Apprenticeship in thinking: cognitive development in social context*. New York, NY: Oxford University Press.

Ruberg, L. F., & Taylor, C. D. (1995). *Student responses to network resources: Formative evaluation of two classes*. Paper presented at the Annual Meeting of the American Educational Research Association, San Francisco, California.

Rutter, M. (1985). Family and school influences on cognitive development. *Journal of Child Psychology and Psychiatry*, *26*(5), 683-704.

Saxe, G. (1991). *Culture and cognitive development: Studies in mathematical understanding*. Hillsdale, NJ: Lawrence Erlbaum Associates.

Sins, P., Savelsbergh, E., Joolingen, W., & Hout-Wolters, B. (2010). Effects of face-to-face versus chat communication on performance in a collaborative inquiry modeling task. *Computers & Education*, *56*(2), 379-387.

Sleeter, C. (2001). Preparing teachers for culturally diverse schools: Research and the overwhelming presence of Whiteness. *Journal of Teacher Education, 52*(94), 94-106.

Stake, R. (1995). *The art of case study research*. Thousand Oaks, CA: Sage Publications.

Vrasidas, C., & Zembylas, M. (2003). The nature of technology-mediated interaction in globalized distance education. *International Journal of Training and Development*, *7*(4), 271-286.

Vygotsky, L. (1986). *Thought and language*. Cambridge, MA: The MIT Press.

Warschauer, M. (1996). Comparing face-to-face and electronic discussion in the second language classroom. *CALICO Journal*, *13*(2), 7-26.

Wegerif, R. (1999). From social interaction to individual reasoning: an empirical investigation of a possible socio-cultural model of cognitive development. *Learning and Instruction*, *9*(6), 493-516.

Wenger, E. (1998). *Communities of practice: Learning, meaning, and identity*. Cambridge: Cambridge University Press.

Wenger, E. (2000). Communities of practice and social learning systems. *Organization, 7*(2), 225-246.

Yin, R. (2003). *Case study research: Design and methods* (3rd ed. Vol. 5). Thousand Oaks: Sage Publications.

About the Author

Christopher J. Devers is an assistant professor of learning and teaching in the School of Leadership and Education Sciences at the University of San Diego. His research focus is learning and technology.

devers@sandiego.edu

http://home.sandiego.edu/~devers

Editor's Note: This valuable study shows how rapid development of a technology can be problematic where materials are not adapted to take advantage of the pedagogical opportunities of the new medium.

Comparing Student Learning and Satisfaction between Learning Environments in Continuing Medical Education

Cheryl Fisher and William A. Sadera

USA

Abstract

The use of distance education in continuing medical education (CME) has become commonplace. This rapid expansion has subsequently led to disintegration of CME course quality. In other words, more and more CME is being offered over a distance without the benefit of empirically based instructional design or consideration for appropriate pedagogy. This study was designed to examine the differences in learning outcomes and student satisfaction in a distance-based video cast CME course. The findings of this study support the need for a new pedagogical approach to the design of CME and the need to make interaction an integral part of the course design.

Over the past decade, distance education has taken on a number of formats ranging from completely online to augmenting classroom discussion with on-line chats, list-serves, audio and video conferencing, and threaded discussions. Technology is not only transforming how we deliver education and training but is expanding our capacity to respond to the needs for higher education and training in a broader sense. With a long history of serving isolated and remote learners, distance learning has now emerged as an effective, mainstream method of education and training that provides flexible learning opportunities in response to learners' needs. Now, as a key component of our new way of learning, distance programs offer learners more control and access to their learning opportunities which, in many cases, like continuing medical education (CME), are becoming mandatory educational requirements. It is the purpose of this paper to report on a research study that examined the differences in learning outcomes and student satisfaction in a distance-based CME research course. This study compared two learning environments (face to face and distance-based) in order to measure students' learning experiences and the learning outcomes.

Review of the Literature

Learning through continuing medical education is an important part of the life of every practicing health care professional. It is imperative that today's health care providers stay current in practice, since patient outcomes are directly impacted by provider knowledge. However, many organizations have questioned the design of CME courses and their effectiveness in the promotion of quality patient care. One key area noted by the Accreditation Council for Continuing Medical Education (ACCME), that can provide improvement in the delivery of quality patient care, can be found in the restructuring and strengthening of current CME course design. The ACCME noted that current CME course structures must be responsive and vigilant to the health care provider's educational needs.

Recently, a plethora of CME studies (Curran, Fleet, & Kirby, 2010; Hodgkin, 2009; Ruf, Berner, Kriston, Maier, & Harter, 2008) had been conducted for better understanding of the field; however, over the years the results of these studies have not been thoughtfully integrated to advance or improve the field of CME. This pressure to expand has subsequently led to disintegration of CME course quality. In other words, more and more CME is being made available online without the benefit of empirically based instructional design or consideration for

appropriate pedagogy. Curran, et al., (2010) further noted that this lack of empirically based instructional design has become a major weakness in terms of advancing or improving the quality of CME.

Distance Learning and Continuing Medical Education

The availability of technology supported CME began emerging in the early 1990's (Casebeer, Kristofco, Strasser, Reilly, Krishnamoorthy, Rabin, Zheng, Karp & Myers, 2004). Since this time, physicians, nurses and other health care professionals have continued to seek available technology supported CME for the convenience and accessibility it has to offer. A recent comprehensive review of CME available on the web found that the number of sites offering web-based CME had risen from 4% to 33% between 2000 and 2009 (Sklar, 2010). Telecommunications and distance technologies are not new, but with increased feasibility it is transforming how we deliver education and training, and expanding our capacity to respond to the requirements for keeping health professionals up to date. With a long history of serving isolated and remote learners, distance learning has now emerged as an effective, mainstream delivery method of education and training that provides flexible learning opportunities in response to learners' needs. For the rapidly expanding field to provide medical professionals the quality courses required to maintain current knowledge for practice, sound instructional design principles and CME research findings must be applied to course development.

In addition to the need for current knowledge by health professionals, Heller, Oros and Durney-Crowley (2000) noted that distance-based nursing education has been driven by major socioeconomic factors as well. Specifically, a faculty shortage has driven the rapid expansion of online course offerings and entire Registered Nurse (RN) to Bachelor of Science in Nursing (BSN) curricula (Mancuso-Murphy, 2007). It is important to note that the participants for these courses are working adults and because of a nursing shortage, the profession is trying to offer the convenience of technology supported continuing education to those actively working within the profession. These factors have forced the profession to respond in a way that is going to continue to be met via distance education because of the convenience and flexibility afforded through this format.

Although the quantity and delivery modalities of CME have increased, most have not been rigorously evaluated, few are based on sound educational principles, and most do not employ strategies to optimize the learning opportunities afforded by new technology (Casebeer et al., 2010). The need for CME is intertwined with the future of medical practice and the expansion in scientific knowledge, increasingly sophisticated diagnostic technologies, and the evolving complexity of clinical practice (Harris, Sklar, Amend, & Novalis-Marine, 2010; Weston, Sciamanna, & Nash, 2008). The internet alone has led to rapid exploitation of CME with hundreds of websites offering accredited online courses. The success of technology supported CME is threatened by inadequate quality assurance and a lack of careful educational design (Shortt, Guillemette, Duncan, & Kirby, 2010). Additionally, most offerings do not make use of the unique ability of the technology to offer multiple paths to learning new material and the capacity to support interactive participation (Sklar, 2007).

As technology advances and CME expands in the direction of distance-based courses, research is needed to continually assess learning within these environments. In a review of 30 CME courses, quality of content was the characteristic most important to participants and too little interaction was the largest source of dissatisfaction (Casebeer et al., 2004). Cobb (2004) reported on nine distance CME studies (Neafsey, 1997; Curran, Hockman, Gulliver, Landells, Hatcher, 2000; Casebeer, Kristofco, Strasser, 2004; Francis, Mauriello, Phillips, Englebardt, Grayden, 2000) and found that the distance format was effective in imparting new knowledge, while three of the studies (Harrington & Walker, 2002; Chumoey-Jones, Dobbie & Alford, 2002; Wutoh, Boren &

Balas, 2004) found that distance methods were effective but not superior. One study found that case-based distance courses were more effective than text-based formats and suggested that increased satisfaction with this format may have been due to the interactive strategies that were employed (Casebeer et al., 2004). This research shows that distance CME can be effective but it is the design of these courses that needs to be carefully scrutinized for optimal learning opportunities.

Pedagogy and the Adult Learner

The majority of distance-based CME credits can be obtained by reading, reviewing, or listening to online learning materials or media and, in some instances, by completing an online quiz (Kamel Boulos & Wheeler, 2007; Weston, et al., 2008); however, the design of these CME programs is noted to be variable and often lacks sound pedagogical principles and appropriate theoretical frameworks. These courses are often similar to face to face courses but lack genuine interaction (Guan, Tregonning, & Keenan, 2008; Sargeant, Curran, Allen, Jarvis-Selinger, & Ho, 2006) because the technology is not appropriately integrated into the course design (Zimitat, 2001). Sikorski and Peters (1998) believe that high quality, distance learning opportunities could provide medical professionals with new options for accessing the best educational programs that medicine has to offer. It could also present new opportunities to interact with expert faculty, integrate newly published or peer reviewed scientific information and clinical developments, and improve the process of taking courses and tracking credits. Li, Paterniti, Co, & West (2010) suggest that CME should be highly self-directed with content, learning methods, and learning resources selected specifically to maintain or improve competencies for clinical practice. If distance-based CME is designed appropriately, then greater opportunities for quality education could be more readily available to the participants. The learning needs of these participants should ideally be considered from their reality, as busy working professional adults with little time for ineffective learning (Manning and Debakey, 2001).

The application of adult learning principles are most appropriate and indeed address key factors for consideration when designing CME (Johnson & Aragon, 2003; Dolcourt, Zuckerman & Warner 2006; Gaff, Aitken, Flouris, Metcalf & 2007). However, others claim that the population participating in CME will benefit from a more in-depth theoretical framework that considers cultural differences, cognitive style, and life experiences (Shannon, 2003). Building on these experiences, Fox (1991) developed a model for learning in professional practice that was adapted to a medical context. Fox's model addresses several foci including knowing in action, reflection in action, experimentation and application of evidence, and reflection on action as a means of evaluation of the outcome of one's action. The participants of CME are indeed adult learners and the considerations for a sound theoretical approach to CME design should take into account the experiences and complexities of these working professionals.

Current technologies have the potential of supporting exciting opportunities for CME offerings; however, as mentioned earlier by (Curran, et al., 2010), Casebeer (2004), and Zimitat (2001), the practice of incorporating research findings into practice continues to need further exploration. Characteristics which foster the best delivery of distance-based CME still need to be employed and further researched in order to develop a greater understanding of effective course delivery. Evaluative research is essential to identify technologies and learning formats that are most effective for facilitating learning and fostering practice change.

Technology supported CME is only going to continue to become more prevalent as health care professionals demand convenience, accessibility, and increased options for obtaining continuing education. It has been argued that distance-based CME offers the potential for creating a new learning environment in which interaction, collaboration, and knowledge building are the defining features (Curran, Kirby, Parsons & Lockyer, 2003). However, it cannot be assumed that

the provision of a technological infrastructure will somehow result in improved course outcomes and guaranteed learning. Various factors seem to influence whether or not students engage in interactive learning strategies, ranging from the pragmatic (for example, easy to use or access) to the pedagogic (for example, the influence of assessment) (Oliver & Shaw, 2003). With increasing use of technology among health care professionals, it follows that there would be increased need for more well designed distance-based CME. One prediction for the future of hospital staff development was that technology will greatly expand and provide new learning formats, including distance learning and independent study. This prediction has proven to be true (Autti, Autti, Vehmas, Laitalainen, & Kivisaari, 2007; Curran, et al., 2010; Harris, et al., 2010; Premkumar et al., 2010).

Methodology

Research Design

This research used a two-group correlational design to assess the relationship between student satisfaction and learning outcomes utilizing two learning environments: face to face and 14 distance locations participating by remote video cast. The data for this research was collected using two instruments; a pre and post test and a satisfaction survey.

Group 1 → Pretest → Course Instruction (Face to Face) → Knowledge Posttest & MTSISS

Group 2 → Pretest → Course Instruction (Video Cast) → Knowledge Posttest & MTSISS
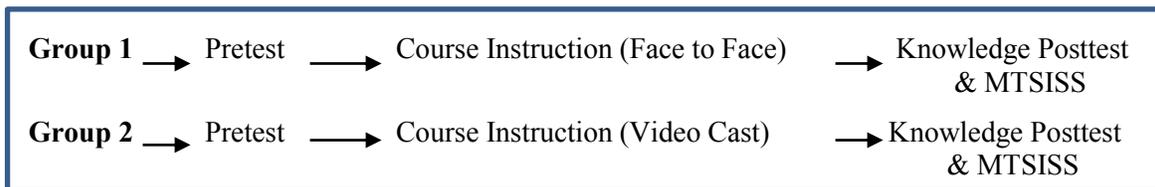
Figure 1: Research Design

Research Questions

To more specifically understand the difference in learning experiences (student learning and student satisfaction) between the face to face and the video cast learning environments, the following research questions were used to guide this investigation:

1. Is there a difference in pre and post-test knowledge scores within each learning environment?
2. Is there a difference in post-test knowledge scores when controlling for pre-test scores between learning environments?
3. Is there a difference between learning environments in student satisfaction scores?

Research Setting and Procedures

The setting for the study took place on the main campus of the National Institutes of Health (NIH) in Bethesda, Maryland. As a part of its training mission, the NIH annually offers this course, the Principles and Practices of Clinical Research (IPPCR). This course is a study curriculum on how to effectively conduct clinical research on human subjects. The program trains researchers in the process of protocol design and development beginning with study design through the final phase of dissemination of findings. Upon successful completion of this course, a certificate and continuing education units (CEUs) are awarded. This course is of interest to physicians and other health professionals training for a career in clinical research. Nine hundred and forty nine (949) participants were registered for the course overall with 350 in the face to face lecture auditorium and the remaining 599 in multiple remote locations connected by live video.

The lecture content offered in this course included topics such as issues in randomization, design of epidemiologic studies, study development, hypothesis testing, participant selection, statistical

methods, ethical issues, and human research subjects. A mock IRB exercise, regulatory issues, and participant selection are some of the other lectures offered.

At the end of each lecture, the presenter provided participants the opportunity for questions and answers. The NIH participants were asked first to come to the microphone to ask their questions followed by the same opportunity for each remote location utilizing the live video technology. Outside of this question and answer period, there are no other opportunities for interaction. Peer to peer and any additional questions would be emailed to the instructor following the course lecture.

Data collection procedure. In order to recruit participants, an invitation letter was emailed and posted on the website a week prior to the start of the IPPCR course. At this time the pretest was made available online for the participants to voluntarily complete. All course participants were asked to participate in this study and were advised by email and through the course website that this would not impact their grade in this course. After a two week period of availability, the pretest was closed down; 108 participants had completed the test.

At the end of the course, the post test was made available online for two weeks. This online multiple choice test was required in order to receive a certificate of completion. Of the 421 course participants who completed the post test, all 108 of those who completed the pretest were included. The pre-post tests were comprised of identical questions. Following the completion of the course, a satisfaction survey was emailed to all course participants. This survey was completely voluntary and the total number of respondents was 105.

Both face to face and distance-based participants received the same instructional experience except for the fact that in the distance-based course the instructor was projected into the learning environment through live video. A pilot study was conducted with the course offered prior to the actual study. The results of the pilot did in fact reveal several research issues which were addressed with the actual study.

Sample. Once permission to conduct this study was obtained from the NIH IRB, data collection was implemented. A letter of invitation was emailed to all participants and posted on the course website describing the importance and purpose of the study. Participation in the pre-test and return of the satisfaction survey implied consent to participate in the study. The convenience sample consisted of participants located in both the face to face (78) and the remote learning environments (135). Due to the logistics in obtaining data, it was not possible to obtain one single sample for this study. Therefore, the data was collected in the naturalistic setting of the course and the subgroups were not mutually exclusive. The first sub-sample consisted of 108 medical professionals who volunteered to take the pre-post test. The second sub-sample consisted of 105 medical professionals participating in the same course who volunteered to participate in the satisfaction survey. It was not known if the participants in the pre-post test sample also participated in the course survey; therefore, it cannot be assumed that the groups were mutually exclusive. These samples were compared for similarities and differences in age, gender, profession, computer experience and reasons for taking the course.

Descriptive statistics and Chi Square analysis was performed on the demographic data to determine distribution between the remote and the local learning environments. These results revealed no significant difference in age, gender, profession, or computer experience. However, significant difference ($p=.02$) were noted in distribution of reasons for taking the course. Table 1 summarizes these results and notes the sample demographics by local and remote locations.

Table 1
Demographics by Local and Remote Locations

	Local	Remote	Significance
Age			
21 – 35	41%	53%	p = .17
36 – 46	27%	29%	
Gender			
Male	42%	62%	p = .19
Female	60%	51%	
Profession			
MD	37%	55.5%	p = .07
PhD	19%	11%	
Other	44%	33%	
Reason			
Research	72%	72.6%	p = .02*
Other	27%	27%	
Comp Exp			
Intermediate	72.6%	73%	p = .08

Note. * = Significant at 0.05

The results of this analysis demonstrate that the local and remote groups were fairly similar with the exception of the difference noted. This difference indicated that there was a difference between groups in response to their reason for taking the course. The reasons included to learn how to conduct research or for CME credits or other reasons such as fellowship requirements. This analysis revealed that 73% of the local group participated in the course to learn how to conduct research, whereas 85% of the remote group participated for this reason. These findings are similar to the demographic characteristics reported in other studies in continuing medical education (Curran, Hoekman, Guliver, Landellis, & Hatcher, 2000; Bisciglia & Turner, 2002).

Survey instruments

As noted, the data for this research was collected using two instruments; a pre and post test and a satisfaction survey. Details about each of the instruments, their reliability and validation follow.

Pre-post test. The pre-post test used for this study was comprised of 79 multiple choice questions compiled from each of the course lectures with each contributing two or three questions. The test was available online to course participants 2 weeks prior and following the course lectures.

A table of specifications was conducted on this instrument in order to determine if the questions were evenly distributed across course objectives. The purpose of a table of specification is to identify the achievement domains being measured and to ensure that a representative sample of questions appear on the test (Chase, 1999). A table of specifications provides evidence that a test has content validity and that it covers what should be covered. Since this multiple choice test was constructed with questions from multiple contributors, this table provided insight into the distribution of questions based on the course objectives. The table of specifications revealed that the percentage of questions representing objectives 1 and 3 were slightly over that recommended and the number of questions for objectives 2 and 4 were slightly under that recommended. The percentage of recommended questions is

determined by the number of times the content is mentioned in the lecture, written in the handout, or referred to in the textbook using a scoring table. Although all objectives were not exactly met by the recommended percentage of test questions, all objectives were represented by an acceptable number.

Student satisfaction survey. The student satisfaction survey, *Measurement of Technology Supported Instruction and Student Satisfaction* (MTSISS), was administered at the end of the course via the course website. This survey consisted of the following five sections: demographics, technology and overall educational experience, interaction and feedback, course materials and course resources and communication, learning styles and learning activities.

The MTSISS Survey consisted of 31 questions and was adapted from an instrument created by Picciano (2002) in order to evaluate student satisfaction, interaction, and performance in a distance-based course. This instrument was modified to reflect the categories of best practices for teaching using technology based on Chickering and Ehrman (1996, *Implementing the Seven Principles: Technology as a* Lever. The modifications made to this instrument included a regrouping of the questions into four categories based on best practices for technology supported teaching and learning. Within this work, Chickering and Ehrman (1996), identify the seven categories that promote teaching and learning in online and technology supported environments and that have been shown to support student satisfaction when learning online.

To assess for inter-rater agreement, the survey was evaluated using a content validity index (CVI). The purpose of CVI was to determine the extent to which the content of the measure represents the content domain. The procedure for the CVI involved two experts who were asked to judge the specific items or behaviors included in the measure in terms of their relevance, sufficiency, and clarity in representing the concepts. The experts used for this index were both informatics nurses with experience as distance learning instructors. The CVI was then used to quantify the extent of agreement between the experts. The CVI measures the proportion of items given a rating of 3 or 4 by both experts. If all items are given ratings of 3 or 4 by both experts, interrater agreement will be perfect and the value of the CVI will be 1.00. The CVI score for this instrument was 0.72 which was considered a good rating.

Section I of the survey (questions 1-3) sought to establish participants' demographic information. This included their location when taking the course, age, gender, and profession.

Section II (questions 4-11) sought to determine the participants experience with technology and their overall educational experience in the course. This section asked questions regarding ease or difficulty using the technology for this course along with other questions related to their level of satisfaction with the course in general. The following rating scale was used; strongly decreased = 1, somewhat decreased = 2, about the same = 3, somewhat increased = 4, and strongly increased = 5.

Section III (questions 12-20) sought to collect data relative to interaction and feedback in the course and the level of engagement the participants felt with their group or the course instructor. The reliability for this section of the survey was 0.87 (Cronbach alpha). The following five point Likert-type rating scale was used: strongly decreased = 1, somewhat decreased = 2, about the same = 3, somewhat increased = 4, and strongly increased = 5.

Section IV of the survey looked at the ease of use and availability of course resources (questions 21-25). This section of the survey sought to determine if the learners found course materials and documents readily accessible. The reliability for this section of the survey was 0.67 (Cronbach alpha). The following five point Likert-type rating scale was used: never = 1, seldom = 2, sometimes = 3, often = 4, and always = 5.

The final section of the survey, section V (questions 26-31), addressed communication, learning styles, and learning activities. These questions sought to determine if learning styles and personal experiences were addressed in the course, if problem solving activities helped to meet personal goals, and if opportunities for feedback and instructional activities were incorporated in the course. The reliability for this section of the survey was 0.78 (Cronbach alpha). The following five point Likert-type rating scale was used: never = 1, seldom = 2, sometimes = 3, often = 4, and always = 5.

Results

Is there a difference in pre- and post-test knowledge scores within each learning environment?

Data generated from the pre-post knowledge test was used to address this question. A series of three paired t-tests were computed to determine if there were differences between pre- and post-test scores. Results of the paired t-test showed a significant difference (p= <.001) between the two test scores for both learning environments. Results of this analysis are presented in Table 2.

It was expected that the scores would increase after the students participated in the course. This analysis revealed that there were significant differences noted between both the local and remote groups in mean scores. The results demonstrate that learning did take place as a result of course participation.

Table 2
T-Test Comparison of Pre-post Test Scores

	Df	Mean	SD	t	p
All (n=108)					
Pre-test score	10759.26	11.75		20.04	.001*
Post-test score		86.56	9.34		
Face to Face Environment (n=40)					
Pre-test score	39	47.58	8.86	18.62	.001*
Post-test score		85.93	10.08		
Remote Environment (n=68)					
Pre-test score	67	45.76	9.51	28.23	.001*
Post-test		86.93	8.94		

*Note. * = Significant at < 0.05*

Is there a difference in post-test scores when controlling for pre-test scores when comparing learning environments?

The data collected from the pre-post knowledge test was used to address this question. A one way ANOVA was computed to determine if there was a significant difference between the two learning environments in the post-test scores. The results showed that there was no significant difference between the learning environments on the post-test scores when controlling for the pre-test scores. This analysis shows no differential improvement in scores by environment. Results of this analysis are presented in Table 3.

Table 3
Post-test Scores Adjusted for Pre-test Scores

	N	Mean	SE
N=108			
Local Group	40	85.8	1.5
Remote Group	68	87.0	1.1

Note. Group (Local vs. Remote) effect F (1,105) =.420; p=.519

This finding demonstrates that the learning location had no significant impact on test scores. These results are in line with similar findings of no significant difference (Wetzel, Radtke & Stern, 1994; Machtmes & Asher, 2000).

Is there a difference between learning environments on student satisfaction scores?

The results of the MTSISS Survey were examined in order to answer this question. Section III (interaction and feedback), section IV (course materials and course resources) and section V (communication, learning styles and learning activities) of the survey were analyzed using a series of independent t-tests. An overall satisfaction score was also computed by combining scores from the above three sections of the survey.

Analysis of this data showed no significant difference between groups' level of overall satisfaction with regard to interaction and course feedback (p = .66); course materials and course resources (p = .63); or communication, learning styles, and learning activities (p = .97). Results of this analysis are presented in Table 4.

Further analysis looked at group differences at the item level. This analysis found that there was significant differences between groups when asked about student perceptions of interaction with other students (p = .03) and when asked about the motivation for students to participate (p = .03). This was possibly due to the lack of opportunities for interactions based on the course design.

Table 4
Group Comparison on Section III, IV, and V of the MTSISS Survey

	N	Mean	SD	t	p
Interaction and Feedback *					
Local Group	37	3.1	.53	1.12	. 66
Remote Group	59	3.0	.59	1.14	
Course Materials and Resources **					
Local Group	40	4.21	.55	1.17	. 610
Remote Group	60	4.08	.57	1.18	
Communication, Learning Styles and Learning Activities *					
Local Group	39	3.25	.60	.55	. 97
Remote Group	60	3.33	.62	.55	

Note. * = Rated using a 5-point scale (1-Strongly Decreased, 5-Strongly Increased);
　** = Rated using a 5-point scale (1-Never, 5-Always).

When evaluating the overall student satisfaction with the course (using grouped means of all three sections of the survey), results of an independent t-test revealed that there were no significant differences between the face to face and the remote learning environments; this demonstrates that the students were just as satisfied with the overall learning experience in the face to face location as they were in the remote locations.

However, upon further analysis using Pearson's Chi-Square, some significant differences were revealed between location and the students' perceptions of interaction with the instructor. This analysis was used with individual items because the items were treated as ordered categories rather than as continuous measures. This analysis revealed a significant difference between learning location and the quality of interaction with the instructor. It was also noted that there was a significant difference between learning location and the perception of instructor availability for feedback. The motivation to participate was also noted as a significant finding. This is important to note because interaction is profoundly documented as being a critical factor in course design (Zimitat, 2001; Harden, 2005; Sadera, Robinson, Song & Midon, 2009). This finding could be related to students desiring more interaction and more feedback from the instructors, however there features were not built into the course design.

Conclusion

The demand for flexible and convenient educational programs to support life long learning and career development in the field of continuing medical education (CME) is increasing. Additionally, continuing education developers have an opportunity and obligation to enhance the professional advancement of health professionals (American Nurses Association, 2000). Distance-based learning, as an instructional format, can respond to these demands by offering a flexible and convenient learning opportunity which can be a constructive educational experience with positive outcomes for the participants. Distance-based CME offers the potential for creating a new learning environment in which interaction, collaboration, and knowledge building are the defining features (Curran, Kirby, Parsons, Lockyer, 2003). However, integration, application, and research of these pedagogical approaches are limited in CME. As the health care environment continues to evolve, professionals' needs for continuing education are changing as well. Since the traditional formal delivery of CME remains popular, practitioners are finding that they have little time to leave their practice to attend CME programs (Barnes, 2007). Although current research in the field of CME has focused on learning outcomes, most ignored theory regarding course design in distance-based learning formats and outcomes specific to the impact on changes in practice.

Although the literature strongly supports no significant difference in learning outcomes between distance and face to face environments (Johnson, Aragon, Shaik & Palma-Rivas, 2000; Shachar & Neumann, 2003; Frydenberg, 2007), the CME literature supports this finding providing the courses are designed using appropriate pedagogy and appropriate application of learning theory. It is evident from this study that several design aspects of this course should be questioned to further analyze best practices for the purpose of enhancing quality and effectiveness in this course. The issue of a lack of student to faculty and student to student interaction, for example, were identified as deficits in this course. It is known from previous research (Wutoh, Boren & Balas, 2004; Zimitat, 2001; Harden, 2005) that the incorporation of collaborative opportunities into the course design will improve instructional quality overall. Furthermore, student to student and student to faculty interaction are principles of best practices according to Chickering and Ehrman (1996). What is not clear, however, is whether or not interaction is a design factor critical to improving course quality in CME. The findings of this study support a demand for consideration of a new pedagogical approach to the design of CME.

With little existing research in the CME literature focused on pedagogical design, it is critical to pursue further research in this area in order to establish sound design principles. Additionally, advances in educational research must be applied to ensure instructional best practices as the CME field continues to evolve. The literature identified that pedagogical best practices are not customarily applied in CME environments and that the proper use of technology for collaboration and learning requires further investigation to determine the effectiveness when incorporated into CME learning environments.

References

Allen, M., Sargeant, J., Mann, K., Fleming, M., Premi. (2003). Videoconferencing for practices based small group continuing medical education: Feasibility acceptability, effectiveness, and cost. *Journal of Continuing Education in the Health Professions, 23*, 38-47.

Autti, T., Autti, H., Vehmas, T., Laitalainen, V., & Kivisaari, L. (2007). E-learning is a well-accepted tool in supplementary training among medical doctors: an experience of obligatory radiation protection training in healthcare. *Acta Radiol, 48*(5), 508-513.

Bisciglia, M., & Monk-Turner, E. (2002). Difference in attitudes between on-site and distance site students in teleconference courses. *American Journal of Distance Education*, *16*(1), 37-52.

Casebeer, L., Brown, J., Roepke, N., Grimes, C., Henson, B., Palmore, R., et al. (2010). Evidence-based choices of physicians: A comparative analysis of physicians participating in Internet CME and non-participants. *BMC Medical Education, 10*(1).

Casebeer, L., Kristofco, R., Strasser, S., Reilly, M., Krishnamoorthy, P., Rabin, A., Zheng, S., Karp, S., & Myers, L. (2004). Standardizing evaluation of on-line continuing medical education: Physician knowledge, attitudes, and reflection on practice. *The Journal of Continuing Education in the Health Professions*, *24*, 68-75.

Chase, C. (1999). *Contemporary assessment for educators*. New York: Longman.

Chickering, A., & Ehrmann, S. (1996). "Implementing the Seven Principles: Technology as Lever," *AAHE Bulletin*, October, 3-6.

Chumley-Jones, H., Dobbie, A., & Alford, C. (2002). Web-based learning: Sound educational method or hype? A review of the evaluation literature. *Academic Medicine, 77*(10), 86-93.

Cobb, S., (2004). Internet Continuing Education for Health Care Professionals: An Integrative Review. *Journal of Continuing Education in the Health Professions*, *24*(3), 171-180.

Curran, V. R., Fleet, L. J., & Kirby, F. (2010). A comparative evaluation of the effect of Internet-based CME delivery format on satisfaction, knowledge and confidence. *BMC Med Educ, 10*, 10.

Curran, V., Hockman, G., Landells, I., Hatcher, L. (2000). Computer mediated conferencing: A hope or hype for healthcare education in higher learning. *Nurse Education Today, 27*(4), 318-24.

Curran, V., Kirby, F., Parsons, E., & Lockyer, V. (2003). Discourse analysis of computer mediated conferencing in world wide web-based continuing medical education. *Journal of Continuing Education in the Health Professions, 23*, 229-38.

Dolcourt, J., Zuckerman, & Warner, K. (2006). Learners' decisions for attending pediatric grand rounds: A qualitative and quantitative study. *BMC Medical Education, 6*(26), 1-8.

Fox, R., (1991). New research agendas for CME; Organizing principles for the study of self directed curricula for change. *Journal of Continuing Education in the Health Professions*, *11*, 155-67.

Francis, B., Mauriello, S., Phillips, C., Englebardt, S., & Grayden, S. (2000). Assessment of online continuing dental education in North Carolina. *Journal of Continuing Education in the Health Professions, 20*(2), 76-84.

Frydenberg, J. (2007). Persistence in university continuing education online classes. *International Review of Research in Open and Distance Learning*, *8*(3), 1-15.

Gaff, C., Aitken, M., Flouris, A., Metcalfe, S. (2007). A model for the development of genetics education programs for health professionals. *Genetic Medicine, 9*(7), 451-57.

Guan, J., Tregonning, S., & Keenan, L. (2008). Social interaction and participation: formative evaluation of online CME modules. *J Contin Educ Health Prof, 28*(3), 172-179.

Harden, R. (2005). A new vision for distance learning and continuing medical education. *Journal of Continuing Medical Education in the Health Professions, 25*, 45-51.

Harrington, S., & Walker, B. (2002). A comparison of computer-based and instructor led training for long term care staff. *Journal of Continuing Education in Nursing, 33*(1), 39-45.

Harris, J. M., Sklar, B. M., Amend, R. W., & Novalis-Marine, C. (2010). The growth, characteristics, and future of online CME. *Journal of Continuing Education in the Health Professions, 30*(1), 3-10.

Headrick, L., Wilcock, P., Batalden, P. (1998). Interprofessional working and continuing medical education. *British Medical Journal, 316*(7133), 771-774.

Hodgkin, C. (2009). CME: From hard reality to virtual reality. [Article]. *Journal of Medical Marketing, 9*(2), 162-165.

Jiang, M. & Ting, E. (1999). A study of students' perceived learning in a web-based online environment. Paper presented at the WebNet 99 World Conference on the WWW and Internet, Honolulu, Hawaii. (ERIC Document Reproduction Service No. ED 448721).

Johnson, S., Aragon, S. (2003). An instructional strategy framework for online learning environments. *New Directions for Adult and Continuing Education, 100*, 31-43.

Johnson, S., Aragon, S., Shaik, N., & Palma-Rivas. (2000). Comparative analysis of learner satisfaction and learning outcomes in online and face to face learning environments. *Journal of Interactive Learning Research, 11*(1), 29-49.

Kamel Boulos, M. N., & Wheeler, S. (2007). The emerging Web 2.0 social software: an enabling suite of sociable technologies in health and health care education. *Health Info Libr J, 24*(1), 2-23.

Li, S. T. T., Paterniti, D. A., Co, J. P. T., & West, D. C. (2010). Successful self-directed lifelong learning in medicine: A conceptual model derived from qualitative analysis of a national survey of pediatric residents. *Academic Medicine, 85*(7), 1229-1236.

Lowe, M. M., Aparicio, A., Galbraith, R., Dorman, T., & Dellert, E. (2009). The future of continuing medical education: effectiveness of continuing medical education: American College of Chest Physicians Evidence-Based Educational Guidelines. *Chest, 135*(3 Suppl), 69S-75S.

Machtmes, K., & Asher, W. (2000). A meta-analysis of the effectiveness of telecourses in distance education. *The American Journal of Distance Education*, *40,* 1331-1345.

Mancuso-Murphy, J. (2007). Distance education in nursing: An integrated review of online nursing students' experiences with technology delivered instruction. [Article]. *Journal of Nursing Education, 46*(6), 252-260.

Manning, P., & Debakey, L. (2001). Continuing medical education: The paradigm is changing. *Journal of Continuing Education in the Health Professions, 21*(1), 46-54.

Neafsey, P. (1997). Computer-assisted instruction for home study: A new venture for continuing education programs in nursing. *Journal of Continuing Education in Nursing, 28*(4), 164-72.

Nowicki, C. (1996). Twenty-one predictions for the future of hospital staff development. *Journal of Continuing Education in Nursing*, *27*(6), 259-66.

Oliver, M., & Shaw, G. (2003) Asynchronous discussion in support of medical education. *Journal of Asynchronous Learning Network, 7*(1), 56-67.

Palloff, R., & Pratt, K. (1999). *Building Learning Communities in Cyberspace*. San Francisco: Josey-Bass.

Premkumar, K., Ross, A. G., Lowe, J., Troy, C., Bolster, C., & Reeder, B. (2010). Technology-enhanced learning of community health in undergraduate medical education. *Can J Public Health, 101*(2), 165-170.

Picciano, A. (2002). Beyond student perceptions: Issues of interaction, presence, and performance in an online course. *Journal of Asynchronous Learning Networks*, *6*(1), 21-40.

Ruf, D., Berner, M. M., Kriston, L., Maier, I., & Harter, M. (2008). [General practitioners online: the conditions are good, but use of the Internet for continuing medical education found to be poor]. *Z Evid Fortbild Qual Gesundhwes, 102*(5), 291-297.

Sadera, W., Robertson, J., Song, L. & Midon, N. (2009). The role of community in online learning success. *Journal of Online Learning and Teaching. 5*(2).

Sargeant, J., Curran, V., Allen, M., Jarvis-Selinger, S., & Ho, K. (2006). Facilitating interpersonal interaction and learning online: linking theory and practice. *J Contin Educ Health Prof, 26*(2), 128-136.

Shachar, M. & Neumann, Y. (2003). Differences between traditional and distance education academic performances: A meta-analytic approach. *The International Review of Research in Open and Distance Learning*, *4*(2).

Shortt, S. E., Guillemette, J. M., Duncan, A. M., & Kirby, F. (2010). Defining quality criteria for online continuing medical education modules using modified nominal group technique. *Journal of Contin Educ Health Prof, 30*(4), 246-250.

Sikorski, R. & Peters, R. (1998). Tools for change: CME on the internet. *Journal of the American Medical Association, 280*(11), 1013-14.

Sklar, B. (2010). Online CME Update, July 2009 (Summary). *Online CME Update, July 2009 (Summary)*, from http://www.cmelist.com/slideshows/

Weston, C. M., Sciamanna, C. N., & Nash, D. B. (2008). Evaluating online continuing medical education seminars: Evidence for improving clinical practices. *American Journal of Medical Quality, 23*(6), 475-483.

Wetzel, D., Radtke, P., & Stern, H. (1994). Instructional effectiveness of video media. Hillsdale, NJ: Lawrence Earlbaum Associates.

Wutoh, R., Boren, S., Balas, A. (2004). ELearning: A review of internet-based continuing medical education. *Journal of Continuing Education in the Health Professions, 20*, 208-218.

Zimitat, C. (2001). Designing effective on-line continuing medical education. *Medical Teacher*, *23*(2), 117-122.

About the Authors

Cheryl A. Fisher, RN, EdD is Program Director for Professional Development for Nursing and Patient Care Services at the National Institutes of Health Clinical Center in Bethesda, Maryland. She received her doctorate in Instructional Technology from Towson University and has a postgraduate certificate in nursing informatics from the University of Maryland and a post graduate certificate in nursing education from George Mason University. Primary areas of research interest are in course and program evaluation from both the staff development and the patient education perspective. cfisher@cc.nih.gov.

William A. Sadera, PhD, is an Associate Professor in the Department of Educational Technology and Literacy at Towson University. He obtained his doctorate in Curriculum and Instruction from Iowa State University. Primary areas of interest include online learning, online learning success factors, instructional design and effective classroom technology integration. E-mail: bsadera@towson.edu.

Distance learners' Work Life Learning Balance

Margarida Romero
Spain

Abstract

Adult learners' time is delimited by family, work and social activities that are in competition. Considering these potential time allocation conflicts, work-life balance aims to find the "balance work and leisure/family activities" (Bratton & Gold, 2003). The current need for permanent knowledge update and the spread of the Information and Communication Technologies (ICTs) have promoted the lifelong learning (LLL) among adults. Therefore, the learning activity is a new temporal pattern to integrate in their lives. Time spent in academic processes could be a source of conflicts for long life learners because of the introduction of a third time to the work-life balance -the academic or learning time- added to the professional and social/family temporal patterns. For this reason, we introduce the concept of Work-Life Learning Balance (WLLB) to refer to the balance of the professional, family and academic activities. We introduce, in this paper, the implications of the WLLB for students' enrolled in distance education that implies the relationship between individual/social temporalities and the external/internal regulation factors We observe that, in distance learning situations, the temporal flexibility implies a higher requirement of students' time regulation competencies., concerning both the planning and regulation of the academic time-on-task and the ability to maintain the activity focus in a context of increasing temporal permeability between work, family/social life, academic activities and multitasking.

Keywords: work-life balance, work-life learning balance, e-learning, CSCL, e-learning quality, time flexibility, time use, time-on-task, time quality; learner' time.

Introduction

A continuum of learning throughout life or Life-Long Learning (LLL) is a major concern for the competitively European Economic Area (EEA), which faces not only a global economic competitiveness, but also demographic changes and rapid technological progresses. In this context, "LLL is an essential policy for the development of citizenship, social cohesion and employment" (EC, 2000, p.4). The recognised need for increasing formal and informal learning opportunities for all the citizenship throughout life poses an enormous challenge in terms of accessibility to learning sources. The European University Association (2008) highlights the needs to respond to the increasingly diverse demand of lifelong learners. For this reason "flexible and transparent learning paths need to be in place for all learners to access and succeed in higher education in all its different forms" (p.5). This challenge involves not only the development of learning solutions but also the reconsideration of the work-life learning balance and the development of time flexible solutions combining face-to-face and e-learning as efficiently as possible. We will first explain distance learning temporal flexibility before introducing the learners' work-life learning balance model.

Distance Learning Temporal Flexibility

E-learning and blended learning (b-learning) solutions allow students to pursue a part or the whole of their learning activities in a distance learning context. In the last years, we have observed an increase in e-learning and b-learning programs in a wide range of academic fields, and at the same time, an increase of the e-learning and b-learning population (Allen & Seaman, 2007; Alpergin, 2007; Educaweb, 2009; Waits & Lewis, 2003). However, the drop-out rates in these contexts are higher than those found in traditional learning contexts (Berling, 2010; Carr, 2000) where students and professors meet in the traditional classroom. Considering time as an important factor in the learning process, we could observe a major difference in the temporalities of the face-to-face modality and the online learning modality. In the face-to-face class, " a group of people starts at the same time, studies the same materials at the same pace, and ends at the same time" (Downes, 1998, p. 1). In the online learning context, temporal flexibility is higher. Collis and Moonen (2001) consider the temporal flexibility in terms of institutional constraints, instructional design characteristics and the students' pace of the students. Bates (2005) considers the temporal affordances of the Computer Learning Environments, distinguishing the synchronous and asynchronous modalities. We can consider that virtual education based on Asynchronous Learning Networks (ALNs) allows higher learning time flexibility than synchronous learning solutions introducing specific temporal constraints for the students.

Despite all the advantages of temporal flexibility in online learning context, this high degree of temporal self-regulation could lead the less regulated students to fail to devote enough time-on-task. Time scarcity has been considered by one of the major factors in e-learning failure. For this reason, and despite the temporal flexibility, we should consider that e-learning can be spaceless, but not timeless.

Considering the time scarcity of the online learners, and the temporal flexibilities of the virtual campus, one of the major challenges of LLL is to balance the online learner's time-on-task and the temporal flexibility. Students' time-on-task should be considered within the work-life balance (WLB) objective.

LLL under the work-life learning balance (WLLB) objective is the consideration of working and family arrangements and policies which assist citizens in combining their lifelong learning engagements with their employment and their social and family life. Traditionally, WLLB has been studied under the perspective of combining both professional and family lives, but the consideration of the need for a continuum of learning throughout life or Lifelong Learning (LLL) introduces a new variable in the balance equation that needs to be solved in order to avoid the failure cases related to lack of (qualitative) time for LLL.

Distance Learners' Work-Life Learning Balance (WLLB)

WLLB involves a consideration of time as an individual resource within different social temporalities or rhythms. We introduce the different temporal frameworks; first, a traditional face-to-face student and the second, a distance learner's WLLB; important differences between the professional, family, social and learning times are shown.
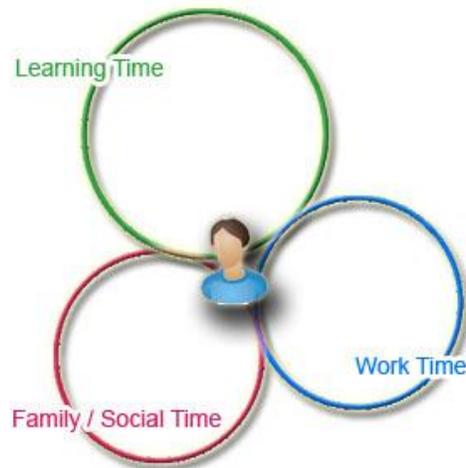
Figure 1. Face-to-face WLLB

In Figure 1 we represent the WLLB in a context of face-to-face learning. In this situation, work, family/social and learning times are generally not overlapping in terms of time and space. When the learner devotes time for his/her learning activity in university, he/she could not combine at the same time professional and family life. The temporal patterns of the face-to-face learner tend to be mutually exclusive because of the different spaces where each of the activities is developed. Face-to-face students go to work at a well-defined place, attend university at another and spend time with their families and friends in a different, separate space. Commuting time between these different locations is also one of the activities where the face-to-face lifelong learners allocate part of their busy schedule.
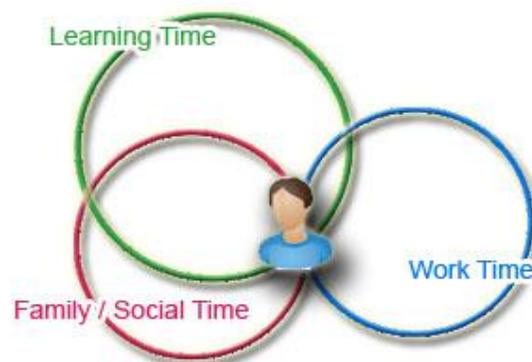
Figure 2. Distance education WLLB

In the figure 2 and 3, we introduce the WLLB in the context of distance lifelong learners. In this situation, adult learners search for balancing their family/social and professional temporal pattern constraints with a distance learning flexible time that allows them to combine their different temporalities (Romero, 2010). In the context of distance education, the learning times could be included in the work and family/social context situation, introducing in some cases an overlap of temporal patterns.
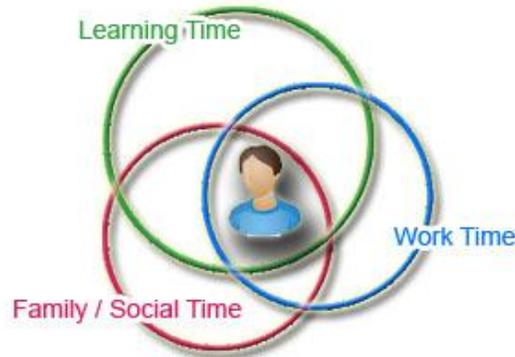
Figure 3. Distance education and distance work WLLB

If distance learners are also distance workers (figure 3), the residence of the adult lifelong learner is the main location for the three activities, allowing him/her to switch between them at the semae place, and consequently increasing the multitask opportunities (Allan & Lewis, 2009).

Distance Learners' Work-Life Learning Balance (WLLB)

In the context of WLLB, we propose the analysis of the individual and social temporalities interdependence under the consideration of Self-Regulated Learning theories (Zimmerman & Schunk, 1989) in order to analyse the internal and external regulations of students' time.

In a distance learning situation, learners should regulate their academic learning times within the temporal flexibility margin of the learning activities proposed by the teacher, who must take into consideration the temporalities he considers in the course planning, the temporality of the information presentation and the frequency of interaction (Shi, Magjuka & Bonk, 2006). The time allocation and regulation competency is essential for distance learners' evolving in a context of overlapping of the professional, family/social and learning times. In a distance learning context we can consider a reduction of the external temporal regulation, leading to an increase of the internal need for temporal regulation and flexibility.
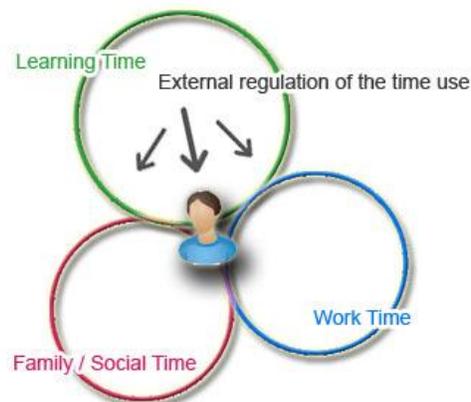
**Figure 4. Face-to-face Work-Life Learning Balance
external regulation of time use**

The figure 5 represents the need for a high degree of internal regulation in the context of time-flexible distance education. A lower degree of external regulation allows a higher degree of temporal flexibility of the online learners, who should be able to regulate their time use across

their different work-life learning activities. In this context, distance learners with lower self regulatory competencies could fail to allocate the quantity and quality of time required by their academic activities. Quantity refers to the number of hours devoted to the learning task; quality refers to the cognitive state of the students that will limit their focus, intensity and continuity of attention on the task. The ability to avoid multitasking in distance learning situations is essential to maintain the focus and avoid the cognitive load and memory reduction of the multitask situations (Hembrooke & Gay, 2003).
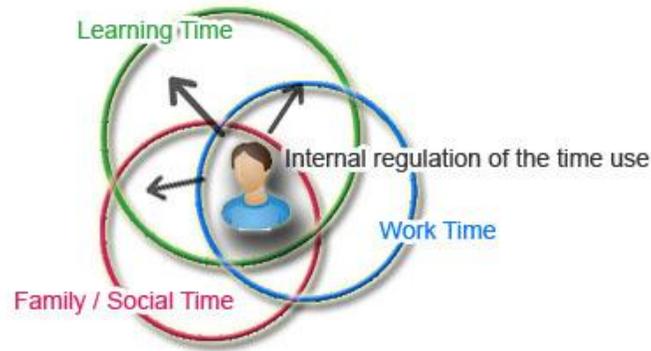
**Figure 5. Distance education Work-Life Learning Balance
internal regulation of time use**

Time Regulation Competency of Distance Learners

Online learners should develop a high capacity for self regulated learning because of the lower external regulation of the distance learning courses and activities. One of the self regulatory competencies the online learners should develop for succeeding in virtual campuses is the temporal regulation competency (usually referred under the popular term of time management). This concerns the learners' competencies to plan his/her time-on-task, to set goals, to self regulate academic times in individual learning activities and regulate those of their teammates' during collective online learning activities. The temporal regulation competency is essential because of the temporal flexibility of distance education (Thorpe, 2006) and the learners' responsibility for allocating his/her academic time-on-task. In addition to these temporal regulation requirements we should consider the increase of the potential introduction of interruptions in the learning process caused by the spread of the ICTs in all the temporal spheres of the adult lifelong learners' activities: the professional, the academic and the family/social spheres. The reason for the increase of learning time interruption could be the argumentation of the potential permeability of other social groups (family, professional groups, etc.) by the use of ICTs, therefore making everyone potentially available anytime for communication. In this regard, ICTs are blurring the frontier between the social spheres and allowing, e.g., to receive family messages in the professional context, but also to introduce the professional sphere in the family one (Tremblay & Genin, 2009). The capability to being focused despite the porosity between the different social groups in a context of increasingly potential multitasking, will be one of the key challenges of the adult lifelong learner to reach a balance between his/her professional activity, his/her family and social times and his/her achievement in distance learning activities. Developing the lifelong learners' temporal regulation competencies should then be considered as one of the strategic objectives for the online universities while supporting their adult learners' achievement and well-being in the reach of the work-life learning balance.

References

Allan, B. & Lewis, D. (2009) Time, Individual Careers and Lifelong Learning. IN: J. Field, J. Gallaher & R. Ingram (Eds) *Researching Transitions in Lifelong Learning*. Routledge, 40-49.

Allen, I. E., & Seaman, J. (2007). *Online nation: Five years of growth in online learning*. Needham, MA: Sloan-C.

Alpergin, F. (2007). A Network-Centric System Architecture for Online Learning Environments. Master's Thesis, Department of Computer Science, Virginia Tech, USA.

Berling, V. L. (2010). Factors Affecting Retention in Online Courses. Unpublished Thesis Dissertation, Indiana State University.

Bratton, J., & Gold, J., (2003), *Human resource management: theory and practice*, 3rd Edition, Palgrave Publishers, Basingstoke.

Carr, S. (2000). As distance education comes of age, the challenge is keeping the students. *The Chronicle of Higher Education*, 46 (23).

Downes, S. (1998) *The future of online learning*. Paper presented at the NAWeb 98 meeting, University of New Brunswick, Fredericton, NB. Retrieved 1 June 2011 from the World Wide Web: http://www.westga.edu/~distance/ojdla/fall13/downes13.html.

European University Association (2008). *European Universities' Charter on Lifelong. Learning*. Brussels: EUA.

EU (2000). *A memorandum on lifelong learning*. Brussels: EU.

Educaweb (2009). Aumenta el interés por cursar formación a distancia. Consultado el 04/04/2011 http://www.educaweb.com/noticia/2009/07/13/aumenta-interes-cursar-formacion-distancia-13769.html

Gros, B., Barberà, E. & Kirshner, P. (2010). Time factor in e-learning: impact literature review. *ELearn Center Research Paper Series*, 0, 16-31.

Hembrooke, H. & Gay, G. (2003). The Lecture and the Laptop: The effects of multitasking in the classroom. *Journal of Computing in Higher Education*, 15(1), 46-65.

Romero, M. (2010). *Gestion du temps dans les Activités Projet Médiatisées à Distance*. Thèse de Doctorat en cotutelle européenne. UTM & UAB. Editions Européenes Universitaires, Saarbrücken: Germany.

Shi, M., Magjuka, R.J., & Bonk, C. J. (2006). Time management strategies for online teaching. *International Journal of Instructional Technology and Distance Learning*, 3(2), http://itdl.org/Journal/Feb_06/article01.htm.

Thorpe, M. (2006) *The Issue of Time in eLearning*, EDEN Annual Conference.

Tremblay, D.G. & Genin, E. (2009). Permeability between work and non-work: the case of IT self-employed workers. *Canadian Journal of Communication*. 33(4). 1-21.

Waits, T. & L. Lewis (2003). *Distance Education at Post Secondary Institutions 2000-2001*, National Center for Education Statistics.

Zimmerman, B. J., & Schunk, D. H. (Eds.). (1989). *Self-regulated learning and academic achievement: Theory, research and practice*. New York: Springer-Verlag.

About the Author:

Dr. Margarida Romero is Associate Director of E-learning at Esade Law & Business School. She holds a European Ph.D. in educational psychology from Université de Toulouse (France) and Universitat Autonoma de Barcelona (Spain).

Contact her at: margarida.romero@esade.edu

Internal and External Factors that Influence Adult Learners in an Online Setting

Lara Henry
USA

Abstract

Online learning is the current distance learning of choice and has increased dramatically. Various studies have been conducted to determine how and why some students complete an online course while others do not. A conclusive answer has not been discovered. To add to the body of information, a survey was conducted of current doctoral students at a large online university to determine if internal factors or external factors were more influential for student completion of the course. The results indicated internal factors were the most indicative for student completion of online coursework.

Keywords: online, online learning, distance learning, online coursework, internal factors, external factors, adult learners, internet, web-based learning, higher education

Introduction

Distance learning has long been a part of higher education, but was conveyed through correspondence or videos in years past. It was not considered a mainstay of a higher education community. In the 1980s, traditional universities, particularly in Canada and Australia, began experimenting with educational technology, particularly computers, in order to fill a need for education to be delivered to sparsely populated areas of the country (Power & Gould-Morven, 2011). Since its inception online learning has increased dramatically particularly within the last ten years. The face of many higher-education institutions have changed significantly with many more adult students enrolling and opting to be involved in online courses to further their education, and also, the addition of many adjunct professors to facilitate the courses. Although many adult students begin online learning programs for various reasons, they do not always finish the program started. In attempts to understand how to increase graduation or retention rates, researchers have approached the issue from two perspectives: how the presentation of the online class affects completion rates and what specific factors influence students completing online courses. Studies previously conducted determined there are two types of factors – internal and external - as well as potential individual characteristics. When trying to determine which factors are most likely going to influence a student's ability to complete an online course, internal factors would appear to be most effective because of the nature of the online course and the need for such a high degree of personal motivation. The purpose of this study will be to examine doctoral students involved in online courses responses to determine if internal factors are of more overall importance than external factors.

Review of Literature

Distance learning has long been a part of education with some suggesting the first distance education experience being Saint Paul and his letters to the Corinthians (Power & Gould-Morven, 2011). Modern distance learning began at the University of London in 1858 with correspondence

education (Power & Gould-Morven, 2011) and continued to grow with the addition of recorded classes through television (Means, Toyama, Murphy, Bakia & Jones, 2009). Online learning is distance learning in its current form and for the purpose of this study is defined as asynchronous internet-based learning (Maeroff, 2003 as stated in Power & Gould-Morven, 2011). According to the Department of Education (2009), online learning is the fastest growing trend, with regard to educational technology, within higher education as well as k-12 education settings.

Overall, adult learners are the most common students of online learning most likely because it allows students to maintain employment and other family responsibilities while being able to conveniently continue with their education with a flexible schedule, low travel costs, and enables students to interact with teachers and students from around the world (Park & Choi, 2009; Hung, Chou, Chen, & Own, 2010). The Department of Education conducted a meta-analysis of studies conducted from 1996-2008 in 2009 in order to convey overall findings for online learning because of its exponential growth. When beginning the study, it was quickly learned that there is very little reliable research on k-12 grade in regards to online learning instead the focus of researchers has been higher education. The meta-analysis conducted by the Department of Education determined that students in online settings, particularly higher education settings, performed modestly better than students found in a traditional face-to-face class. At the same time, many students do not finish online courses and high drop-out rates are of concern to higher education institutions even as, paradoxically, more students turn to online learning (Park & Choi, 2009; Aragon & Johnson, 2008). This finding begs the question of what makes the online student successful and it has been asked by several researchers in various forms.

There have been several studies conducted to address this question, but each has a different approach to the question and generally has a small sample from one area. In several cases, the studies occurred in higher education settings outside of the United States. Because of this, it is impossible to generalize the information and make applicable to all online students. However, the studies conducted do provide a starting point. With the rise of internet usage, Mahoney (2003 as cited in Hung et. al., 2010) determined through study that self-management of learning and student's internet comfort level were the two best predictors of student success in the online classroom. The information provided was based on self-reports which can be viewed as unreliable. In 2007, Roper asked graduates who were taking 80 percent of more of their courses online with a grade point average of 3.50 or better to answer open-ended survey questions to describe what techniques they each found most useful to complete the courses and stories of their experiences. With the completion of the survey, the students' answers could be formed into seven basic tips:

1. the use of time-management strategies
2. making the most out of online discussions
3. using the information learned in the class in order to retain it
4. asking questions
5. given the opportunity to convey which instructional techniques were the most useful
6. making connections with fellow students
7. maintaining motivation (Roper, 2007).

The students of Roper's survey (2007) found interaction with students through email and discussion boards of great importance for completion of online courses. As with Mahoney's 2003 study, the information presented is based solely on self-reporting aspects making generalization more difficult.

In 2010, Ma and Yuen conducted a study stating online learning success could be found through a social attachment theory concept based on the communities of practice theory stating "engagement in social practice is the fundamental process by which humans learn" (p.210).

Through a survey of current online students taking an English course, Ma and Yuen (2010) determined having social attachments promoted within the online setting was found to be highly effective in retaining and completion of online courses. The self-regulation of motivation model suggests that there are two kinds of motivation essential for completing an online course and neither are connected to social attachments suggested by Ma and Yuen (2010). In contrast, they are goal-defined motivation or value and expectancy of learning and experience-defined or whether the class is interesting (Sansone, Fraughton, Zachary, Butner, & Heiner, 2011). Using this model Sansone et. al. (2011) determined that a personal interest in computers would maintain a higher level of engagement in the online course indicating.

Aragon and Johnson (2008) conducted a study not based in theories such as social attachment or goal-defined motivation, but to determine if there were differences found between completers and non-completers of an online course based on demographics, enrollment, academic, and self-directed learning characteristics. The results showed no significant differences based on age, gender, ethnicity, financial aid eligibility, and developmental course placement, but significant differences based on gender (66% of females completed compared to 52% of males similar to a finding by Park and Choi in 2009), grade point average (completers had higher GPA than non-completers), and how many online courses students were currently enrolled (higher number of courses for completers compared to non-completers) (Aragon & Johnson, 2008). The non-completers involved in the study by Aragon and Johnson (2008) were also asked to provide reasons for their not completing the online courses and five overall reasons were given: personal time constraints, unhappy with course design and instructor communication, technology issues, institutional issues and the format did not match their learning style. With the results of this study, Aragon and Johnson maintained their earlier stance that the most successful online environments

1. address individual differences
2. motivate the student
3. avoid information overload
4. create a real-life context
5. encourage social interaction
6. provide hands-on activities
7. encourage student reflection

(Johnson & Aragon, 2003 as cited in Aragon & Johnson, 2008, p. 155).

Aragon and Johnson (2008) go on to state that advisors should determine if students will be able to complete an online course and if not, steer them to a traditional format. How to best determine if students were ready for online courses was not addressed only that advisors should do so (Aragon & Johnson, 2008). Hung et. al. (2010) also addressed the need to determine if students can successfully complete an online course before allowing them to be enrolled. Through a study, an Online Learning Readiness Scale was validated for five dimensions: self-directed learning, motivation for learning, computer/Internet self-efficacy, learning control, and online communication self-efficacy (Hung, et. al., 2010). Through self-reports, Hung et. al. (2010) discovered a statistical difference based on current grade; the higher the grade the higher readiness level based on the five dimensions of the Online Learning Readiness Scale. While criteria were provided, how to best implement and determine student readiness was not presented by Hung et. al. (2010).

Park and Choi (2009) conducted a study specifically to determine what factors- internal, external or individual characteristics- most influenced adult students' decision to complete or drop out of an online learning class. The external factors of family and organizational support, individual characteristics age, gender, educational background, and employment status and internal factor of

motivation, particularly relevance and satisfaction, were chosen to be included because they were often cited in previous studies discussed in the literature review (Park & Choi, 2009). The results indicated a statistical difference in perceptions of drop out and persistent adult students with regard to family and organizational support and satisfaction and relevance of the course with persistent students citing a higher level of all compared to drop out students. Park and Choi (2009) stated that the framework of family support, organizational support, satisfaction, and relevance can be used as predictors for students' decisions to drop out or persist in their studies. It is within the concepts presented by Park and Choi (2009) that the current study was drawn and conducted.

Method

The participants of this study were students currently pursuing their Educational Specialists (EdS) or Doctorate in Education (EdD) through an online or blended program at a southeastern college that has one of the largest online colleges in the United States. Students ranged in age from 30-69 with a little over half currently teaching today. Forty students currently in one of two courses were emailed a link to an online survey in May 2011 and asked to volunteer to answer the questions anonymously to be used for the research project.

 The online questionnaire to report students' responses on factors influencing completion of online courses utilized quantitative descriptive research sometimes called survey research, the same type of research used in many reviewed studies, and while one cannot draw conclusions about relationships it can often provide valuable information on opinions and attitudes of both students and teachers (Gall, Gall & Borg, 2007; Glatthorn & Joyner, 2005). For this particular survey, students were asked to provide gender, age, current program of study, and whether they were currently teaching. Students were then asked to rate 20 questions on internal and external factors influencing completion of online courses using a Likert scale. The internal (social integration, academic integration, technology issues, and lack of motivation) and external (scheduling conflicts, family issues, financial problems, managerial support, and personal issues) factors presented within the survey were taken from Park and Choi's 2009 study. Participants were also asked to provide any additional responses that were not included, but none did so.

Results

Of the 40 surveys requested, 15 surveys were completed and the results are as follows:

	I complete coursework	Strongly disagree	Disagree	Agree	Strongly agree	n/a
1.	because of my own personal enjoyment	6.7%	20%	60%	13.3%	-
2.	for future enhancements in pay	-	13.3%	33.3%	53.3%	-
3.	for opportunity to interact with peers through discussion	6.7%	20%	53.3%	6.7%	13.3%
4.	because of family support	6.7%	13.3%	53.3%	26.7%	-
5.	because of the support of my co-workers	20%	26.7%	33.3%	13.3%	6.7%
6.	because of encouragement from immediate supervisor	26.7%	40%	20%	6.7%	6.7%
7.	even when personal issues occur	-	-	40%	60%	-
8.	at personal financial costs	6.7%	6.7%	46.7%	40%	-
9.	because of a love of computers and technology	40%	46.7%	6.7%	6.7%	-
10.	to enhance my knowledge of a subject	-	-	40%	60%	-
11.	because of instructor feedback and correspondence	6.7%	33.3%	40%	13.3%	6.7%
12.	because of the usability of Blackboard	13.3%	46.7%	26.7%	6.7%	6.7%
13.	because I like to share ideas with others	-	20%	60%	20%	-
14.	because I am open to new ideas	-	-	60%	40%	-
15.	because of personally developed time management strategies	-	13.3%	46.7%	40%	-
16.	for sense of accomplishment	-	-	40%	60%	-
17.	because of additional help found through online writing tutors	26.7%	46.7%	6.7%	-	20%
18.	out of respect for the attending university	13.3%	20%	46.7%	13.3%	6.7%
19.	to achieve a personal goal	-	-	13.3%	66.7%	20%
20.	because of personal interest the instructors have shown	6.7%	33.5%	33.5%	26.7%	-

The items surveyed are ranked for which are considered the most important. Each item is also identified as being internal or external.

I complete coursework to achieve a personal goal. (internal)

I complete coursework for a sense of accomplishment. (internal)

I complete coursework to enhance my knowledge of a subject. (internal)

I complete coursework even when personal issues occur. (external)

I complete coursework for personal enjoyment. (internal)

I complete coursework because I like to share ideas with others. (internal)

I complete coursework because I am open to new ideas. (internal)

I complete coursework for future enhancements in pay. (external)

I complete coursework for opportunity to interact with peers through discussion. (internal)

I complete coursework because of family support. (External)

I complete coursework at personal financial costs. (external)

I complete coursework because of instructor feedback and correspondence. (external)

I complete coursework because of personally developed time management strategies. (internal)

I complete coursework out of respect for the attending university. (external)

I complete coursework because of support for my co-workers. (external)

I complete coursework because of personal interests the instructors have shown. (external)

I complete coursework because of the usability of Blackboard. (external)

I complete coursework because of encouragement of immediate supervisor. (external)

I complete coursework because of a love of computers and technology. (internal)

I complete coursework because of additional help found through online writing tutors. (external)

Discussion

The purpose of this research was to add to the body of research regarding online learning retention. The findings support the hypothesis that internal factors are more influential toward completion of online courses than external factors based on Park and Choi's 2009 study. Students rated personal goals and sense of accomplishment the two highest reasons for completion of courses, strongly indicating internal factors. One interesting result was the higher score of future enhancement in pay and completing the course regardless of personal issues both external factors being ranked in the middle of various internal factors. However, personal issues could also be viewed as an internal factor it was included as external based on Park and Choi's study in 2009. Pay enhancements, while an external factor, could be influenced by internal factors such as providing for ones' family more effectively. Also interestingly, love of computers and technology, the motivating factors for online learning presented by Sansone et. al. (2011), and time management strategies, the highest motivating factor presented by Mahoney (2003) and Roper (2007), were the two lowest scored internal factors in the study. Because of the nature of this study and the use of a brief survey, the researcher was not able to cross-examine the results by gender, age, program of study, or current teaching position. With two prior studies indicating females are more likely to complete online courses, it would have been interesting to view the rankings by gender. Future studies could also cross-examine the results based on the program of study particularly any difference between bachelors, masters, and doctorate programs. A study such as this could indicate if students with higher internal motivation continually do well in online courses compared to students who do not or if there is a difference within the three levels of study.

Conclusion

The results of the current study cannot be generalized to a large population as with other similar studies because of the small sample size and the nature of the research design: descriptive research. Many past research studies also occurred in schools outside of the United States thus making comparative statements more difficult to make. It can be added to body of research stating that internal factors provide more motivation to students to complete an online course. Aragon and Johnson (2009) determined through the results of their study that students need to be screened and prepared to take an online course because of the nature of its delivery. The results of this study along with other such as Park and Choi (2009) would indicate that students may need to determine their locus of control, either internal or external, before taking an online course in order to be successful. College textbooks, such as Carol Kanar's *The Confident Student* (2010), provide online resources for students to use to determine their locus of control. Higher education administrators should perhaps take this into consideration and have advisors trained to help direct students to the type of instruction that best suits them. In addition they should be providing information to students and access to resources such as those found through Kanar's (2010) book in order to help college students determine which instruction type would be best suited.

References

Aragon, S. R. & Johnson E. S. (2008). Factors influencing completion and noncompletion of community college online courses. *The American Journal of Distance Education, 22*(3), 146-158.

Gall, M. D., Gall, J. P., & Borg, W. R. (2010). *Educational Research: An Introduction* (8th ed.). New York: Allyn & Bacon. ISBN: 978-0-205-48849-0.

Glatthorn, A., & Joyner, R. L. (2005). *Writing the Winning Dissertation*: *A step-by-step guide*. Thousand Oaks, CA: Corwin Press.

Hung, M.-L., Chou, C., Chen, C.-H., Own, Z.-Y. (2010). Learner readiness for online-learning: Scale development and student perceptions. *Computers & Education, 55*(3), 1080-1090.

Kanar, C.C. (2010). *The Confident Student, 7*th ed. Boston: Houghton Mifflin Company. ISBN: 978-0-618-76643-7

Ma, W.W.K. & Yuen, A. H. K. (2011). Understanding online knowledge sharing: An interpersonal relationship perspective. *Computers & Education, 56*(1), 210-219.

Means, B., Toyama, Y., Murphy, R., Bakia, M. & Jones, K. (2010). Evaluation of evidence-based practices in online learning: A meta-analysis and review of online learning studies. *US Department of Education Office of Planning, Evaluation, and Policy Development Policy and Program Studies Services*. Retrieved from http://www2.ed.gov/rschstat/eval/tech/evidence-based-practices/finalreport.pdf on May 13, 2011.

Park, J-H. & Choi, H. J. (2009). Factors influencing adult learners' decision to drop out or persist in online learning. *Educational Technology and Society, 12*(4), 207-217. Retrieved from EBSCO.

Power, M. & Gould-Morven, A. (2011). Head of gold, feet of clay: The online learning paradox. *International Review of Research in Open and Distance Learning, 12*(2), 19-38.

Roper, A. R. (2007). How students develop online learning skills. *EDUCAUSE Quarterly, 1*, 62-65. Retrieved from http://net.educause.edu/ir/library/pdf/eqm07110.pdf on April 7, 2011.

Sansone, C., Fraughton, T., Zachary, J. L., Butner, J., & Heiner, C. (2011). Self-regulation of motivation when learning online: The importance of who, why and how. *Educational Technology Research and Development, 59*(2), 199-212.

About the Author

Lara Henry is currently an online doctoral student at Liberty University. Beginning in the fall 2011, the author will be returning to teach seventh grade social studies while completing her Educational Doctorate program of study with an emphasis in Curriculum and Instruction.

Email: lehenry@liberty.edu

Managing Borderless Collaboration in Asia:
Commitment, Coordination and Communication

Juvy Lizette Gervacio
Phillipines

Abstract

Managing online collaboration is challenging, especially when members are not only separated by space and time but they also come from different culture, language, context and institutions. However, given a common goal, proper coordination and effective communication tools, a borderless collaboration can be successful and effective.

The paper aims to look into how online tutors can collaborate to effectively and efficiently achieve a desired goal. Specifically, it aims to: a) describe how online collaboration is effectively implemented by tutoring communities; b) describe the coordination employed in planning, implementation, monitoring and evaluation for effective collaboration; c) determine the effective communication tools to manage and sustain collaboration; and d) identify the challenges and lessons to maintain and sustain online collaboration.

Introduction

In the era of information, communication and technology, everything has become borderless. People can now communicate better and faster. Moreover, it made working together cost effective and more efficient. Online collaboration happens when members of virtual communities commit themselves to a certain goal and they work together through the use of online communication tools. Not only does it deliver desired outcomes, there is also the meeting of cultures and minds which makes collaborative activities fruitful and interesting

However, managing online collaboration is a challenging one, especially when members are not only separated by space and time but they also come from different backgrounds, culture, language, context and institutions. But given a common goal and effective communication tools, borderless collaboration can be successful and effective.

According to Siemens, the "management and marshaling of resources to achieve desired outcomes is a significant challenge. Moreover, diverse teams of varying viewpoints are a critical structure for completely exploring ideas." (Siemens 2005).

Hence, in order to ensure the success of any online collaborative activity, it is important to consider how the project is managed from planning, implementation, monitoring and evaluation. In online collaboration, there are important ingredients and strategies that need to be employed in order to ensure success.

Objectives

The paper aims to look into how online collaboration in Asia is managed efficiently and effectively. Specifically, it aims to: a) look into how the eLearning Development and Implementation (eLDI) and eskills Asia programs is being managed as a collaborative project among different members of the Asia network; b) describe how online collaboration is effectively implemented by tutoring communities; c) describe the coordination employed in the planning, implementation, monitoring and evaluation for effective collaboration; d) determine the effective

communication tools to manage and sustain collaboration; and e) identify the challenges and lessons to maintain and sustain online collaboration.

Framework of the Study

Good planning and preparation for a collaborative project and continued involvement during the entire phase of project management contributes to the success of a collaborative activity. Palloff and Pratt notes that online collaboration undergoes several phases, namely: set the stage, create the environment, model the process, guide the process and evaluate the process. (Palloff and Pratt, 2005).
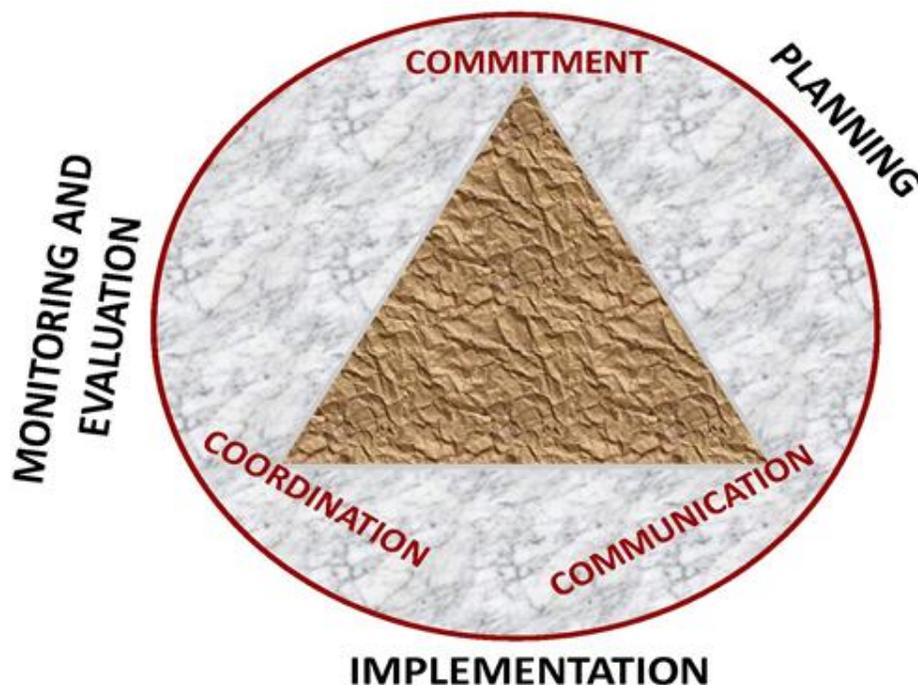
Figure 1. Framework of the Study

Figure 1 shows the framework of the study. The framework illustrates how online collaboration could be managed success from planning, implementation to monitoring and evaluation. Three C's are important for an online collaboration to be successful, namely: commitment to achieve the goals, coordination of activities and schedules, and use of effective online communications tools.

Commitment

Clear Goals. In Project Planning, the goal of the activity should be clearly defined. It is important that members of the team should have a clear understanding of the desired output and outcome of the program. The members are introduced with each other and they are expected to have knowledge of what to do. The goal is a commitment that all members should strive to achieve.

Coordination

The role of a coordinator or a program manager should also be clear. The coordinator manages the entire program and ensures that by the goal is achieved. Each member of the team must be able to contribute to the task on hand. It is important that even if they work independently, they

all work towards a shared goal or a commitment. Hence, coordination regarding the different tasks of the teams should be communicated clearly.

Tasking. One important aspect is coordination is the assigning of tasks or responsibilities to the members of the team. All the tasks of the members should be clearly spelled out to them. When necessary, a manual or a "terms of reference" is provided which illustrates the work schedule, and the activities to be done before, during and after the work.

Qualification. The coordinator ensures that all the members meet the requirements for them to be part of the team. In online collaboration, it is important that the members have excellent written communication skills since they interact with people coming from different culture, language, background, etc.

Moreover, they must also have the knowledge on the use of appropriate technology in order to interact with each other.

Content expertise is also an important requirement for the program to be successful.

Communication

The use of a common language is very important in online collaboration. In an environment where the different members of the team come from different countries, it is important that members use a common language in a level that is understood by everyone. Moreover, netiquette is also important to emphasize.

Communication Tools. Interaction is done through the use of relevant online communication tools, whether done synchronously or asynchronously. Interaction could be done through chats, forum, instant messengers, videoconferencing, among others. In all levels of interaction, it is assumed that all the members have access and knowledge in using these tools.

Learning Management System/Technology. Technologies used are crucial in managing global learning communities which may include the use of a learning management system. Every member of the online team should have quality access to technology because lack of technological access can hamper success of the project.

Monitoring and Evaluation.

Monitoring is an on-going process during the project implementation stage. On the other hand, evaluation occurs periodically, typically when the project has been completed. Compared to monitoring, it has a broader perspective as it challenges the original assumption of the project design. It focuses on the project's progress towards realizing its purpose and goal.

In online collaboration, it is important that there is monitoring to ensure that the project is on the right track. It is the task of the coordinator or manager to monitor the activities. At the end of the project, an evaluation is also needed to determine how the program could be improved and determine lessons from the activity.

Methodology

This paper is based on the experiences of the author in managing online collaboration in Asia. Specifically, it documents the processes in managing online teams from planning, implementation to monitoring and evaluation. Moreover, it discusses the factors that contribute to the success of online collaboration and lessons from the good practices which can be adapted in managing online collaboration.

Managing Online Collaboration in Asia: Approaches and Strategies

Project Description

In 2009, the German International Cooperation (GiZ, formerly InWEnt, Capacity Building International, Germany) and the University of the Philippines Open University (UPOU) mutually agreed to "contribute to enhance e-learning worldwide, especially in South-East-Asia and the Philippines." Both organizations agreed to promote further development of e-skills training programs and e-learning technologies in order "to build a people-centered, inclusive and development-oriented Information Society, where everyone can create, access, utilize and share information and knowledge, enabling individuals, communities and peoples to achieve their full potential in promoting their sustainable development and improving their quality of life, premised on the purposes and principles of the Charter of the United Nations and respecting fully and upholding the Universal Declaration of Human Rights" as stated in the WSIS Declaration (§ A1) (InWEnt and UPOU Memorandum of Understanding, February 2009).

The Commitment (Goal of the Project)

The main Goal of the Project is to implement two elearning programs; namely: 1) eLearning Development and Implementation Asia (eLDI) program; and 2) e-skills courses.

The eLearning Development and Implementation (eLDI) Program. The eLDI Asia is an eight-month blended course consisting of two face to face workshops and six online modules, namely: Instructional Design, Content Development, Interactivity, eLearning Technology, eLearning Management and Tutoring for eLearning communities. The course consists of approximately 50 hours face to face workshops and 200 hours online.

The participants are entitled to a certificate from the course. They also have the option to take an exam being undertaken by the University of Furtwangen, Germany. If they pass the written examination, and their eLearning projects are assessed satisfactorily, then they are entitled to get credit units for it. Moreover, they are also given a certificate of expertise on "New Learning Technologies."

The eLearning-skills Courses (e-skills). The e-skills courses are conducted purely online. These are composed of six modules which is similar with the eLDI modules except for Interactivity that is replaced by eLearning Strategy. Each module is taken online for 4 weeks. Certificate is also issued to participants who complete the course successfully.

The Course Participants. The eLDI program trained 20 participants from developing countries from Asia, namely: Cambodia, India, Indonesia, Mongolia, Nepal, Philippines and Vietnam. Most of the participants are from the academe, government and private sectors who are into capacity building, or involved in the use of ICT for learning.

Unlike in the eLDI program where participants are the same all throughout the course, the eskills modules were offered separately. Hence, participants have the option to apply for courses they are interested in or take all six courses. There were about 20-25 participants from Asia for each module.

Even in the application and selection of participants, the activity is already on going in collaboration with the members of the network which is composed of those who have previously taken the courses. Announcements and application forms are prepared and distributed to all members of the network and also posted in the Global Campus 21 E-Academy site of GiZ and the UPOU website.

Even if the submission of application is centralized, the focal persons from each country are contacted to provide more information about the applicants and make necessary recommendations.

Coordination

Planning. In any collaborative project, it is important to have a plan. The budget is ensured and negotiated to ensure that the activity has the appropriate funding. During the planning phase, tutors are already identified based on their knowledge and ability to communicate online effectively. Since almost all of them have participated in previous elearning programs, the tutors are selected based on their online performance. Their ability to complete the tasks communicate effectively online is very important. If possible, tutors and co-tutors/assistant tutors do not necessarily come from one country. The tutors are asked for their availability on the tutorial's dates and they confirm it through email.

Table 1
Program Content and Support eLDI and e-skills

Modules/Phases	eLDI Schedule		e-skills Schedule	Support
		Project Coordinator Finance Officer Facilitators		Course Manager Finance Officer
WS I – Face to Face	1 week		None	
Online phase		Umbrella Tutors (eLDI) Toolbox Support LMS (GC21) Support		LMS (GC21) Support
eLearning Strategy	None	None	3 weeks	Tutors (2)
ID Instructional Design	4 weeks	Tutors (2)	4 weeks	Tutors (2)
CD Content Development	4 weeks	Tutors (2)	4 weeks	Tutors (2)
INT Interactivity	4 weeks	Tutors (2)	None	Tutors (2)
eLT eLearning Technology	4 weeks	Tutors (2)	4 weeks	Tutors (2)
eLM eLearning Management	4 weeks	Tutors (2)	4 weeks	Tutors (2)
TeL Tutoring for eLearning Communities	4 weeks	Tutors (2)	4 weeks	Tutors (2)
WS II – Face to Face	1 week	Facilitators	None	

Table 1 shows the program content and the support for the eLDI and eskills courses. The tutors collaborate with each other in order to achieve the goal of the program. For the eLDI, there are about 17 tutors working together online in order to provide tutoring and support to the participants. On the other hand, there are 15 tutors for the eskills courses.

The Tutorial Team

For the eLDI Asia 2009, the members of the tutorial team who collaborated in order to achieve success came from Cambodia, India, Mongolia, Philippines and Sri Lanka. Most of them finished the eLDI or the eskills courses. They were selected based on their knowledge of the content, excellent communication skills and their familiarity with eLearning. They normally start as assistant tutors where they learn how to tutor and manage their courses. They are coached by the main tutor and by umbrella tutors on the use of communication tools and how to give feedback on the tasks of participants.

Umbrella Tutors – They are often referred to as main tutors or umbrella tutors for the eLDI course. They ensure smooth transition of the course from one module to the next. They orient the tutors about the activities, guide them on their online games, and monitor the overall performance of the tutors. They also ensure that tutors collaborate effectively by always reminding tutors to work as teams.

Module Tutors - There are two tutors for each module with the idea that the assistant tutors is being trained to eventually become part of the pool of tutors of the network. They provide tutoring to the participants for four weeks. They are also expected to allot two more weeks for preparation and report preparation. The two tutors are expected to work together. In case there are disagreements, the umbrella tutors and the course manager will try to find a way to settle the issue.

Toolbox Support – These are the tutors who provide support in using several online tools used such as authoring tools, photo-editing tools, flash animation, among others. They are expected to work closely with the module tutors.

Learning Management Support – They are in charge of maintaining the working environment such as updating the news and uploading the course materials for each module.

Course Manager – The manager oversees the overall implementation of the activities, providing online guidance, coaching, support and leadership.

Handbook of Tutors

In order to ensure that all the tutors are aware of their duties and responsibilities, a Tutorial Handbook is provided to all the tutors. The manual contains all the necessary information on the course such as the dates, the tutors and email addresses. It also specifies the duties and responsibilities of tutors and assistant tutors every week, including how to track the progress of the participants. The handbook also contains some suggested activities including the deadlines.

The tutors are also provided an email address which they use during the entire duration of the project.

Contracts

Before the start of the activity, the tutors are required to submit their short resume. Their contracts are prepared which provides a list of their deliverables. The tutors are asked to sign, scan and email the contract to the coordinator.

The Tutors' Lounge

One of the important elements of doing collaborative activity is the creation of a virtual "Tutors' Lounge" where all the tutors interact and submit reports. The Tutors' Lounge is a virtual working environment where tutors can meet and discuss and upload reports. This is where collaboration is done. (Please see Figure 2.)

The tutors lounge provides the communication tools features such as chat and forum. Moreover, it provides a submission area where all reports are expected to be uploaded.
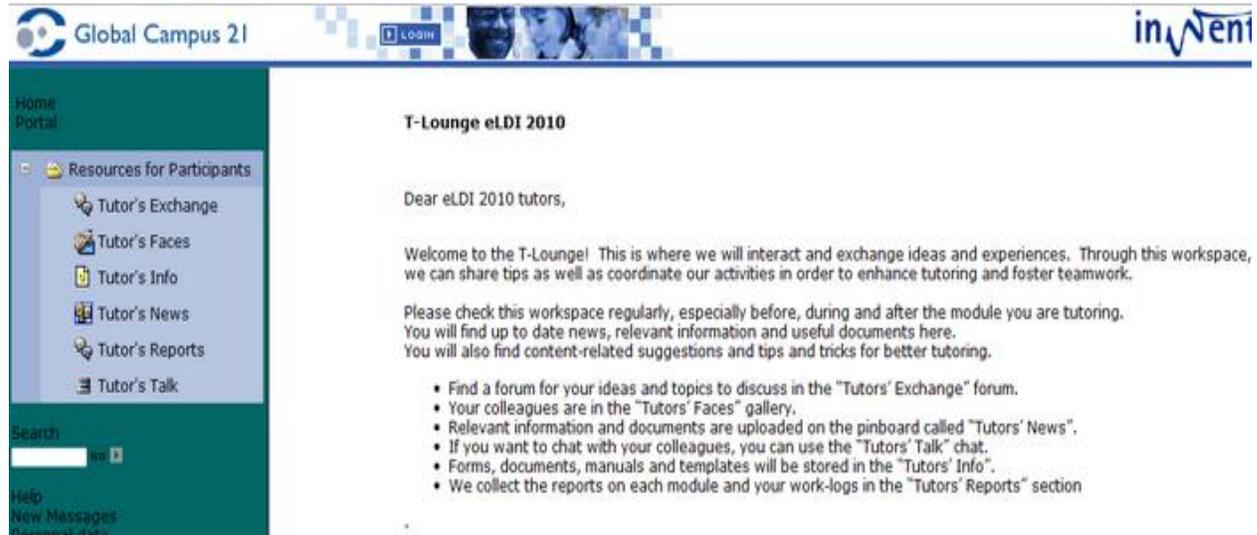

Figure 2. The Tutors' Lounge

Communication Tools

Several communication tools were used in the collaboration. These are chats, forum, pinboard and the document pool.

Chat – A group chat is conducted to provide opportunity for the tutors to introduce themselves and get to know each other. This is conducted in the Tutors' Lounge. During the chat, they are given an orientation of the activity and if they have questions related to the tutors' handbook, the participants, and their tasks. Before the start of each module, the tutors are again provided another orientation of their tasks.

If there are tasks that are not clear, the course manager explains it to the tutors. Moreover, the tutors are also provided an overall picture of the participants., e.g. very active, quite, etc. It is also important to ask the tutors to provide some online games to the participants in order to provide a better online learning environment.

Forum – This is one on the interactive tools that is used in online collaboration. In the forum, tutors discussed topics that are related to effective tutoring, assessment, providing feedback, among others. It also provides an opportunity for members to share information about themselves such are their recent activities, travels, photos, among others.

Pinboard – This is the area where all the announcements are made.

Document Pool – This is the one of the most important part of the Tutors' Lounge. This is where the tutors upload all their reports. They complete the participants tracking form, and provide a personal assessment about how they tutored the course.

Learning Management System and Technologies. To facilitate the online collaboration, the eLDI and eskills online phase are conducted through the use of Global Campus 21 e-Academy, a learning management system of GiZ. This is also where the Tutors' Lounge is hosted.

Monitoring and Evaluation

During the online phase, tutors are monitored through the Tutors' Lounge, and how they conduct online tutoring. In cases where there are differences among the tutors, the course coordinator or manager will provide them guidance on how to settle the issue. Moreover, if there are disagreements with the course participants, proper communication is also done in order to minimize disturbance in the online classes.

The tutors are required to complete the participants track in order to monitor the performance of each participant. Moreover, they also need to submit two reports such as the Joint Module Tutors Report and a Personal Tutoring Work- log.

Joint Module Tutors Report – For module tutors, they are asked to write a report of their experiences, impression on the module, suggestions for forum threads and/or chat discussions, exercises, among others.

Personal Tutoring Work log – This is where the tutors write down their activities every week, the number of hours for these activities, the strengths and weaknesses of the tutor as well as the challenges encountered and suggestions to improve the course.

An online evaluation form is also sent to the participants to complete. This includes questions on how effective their tutors are in their jobs. The results are conveyed to the tutors so they have feedback on how they did their job.

Conclusion and Lessons Learned

Managing online collaboration is a challenging but fruitful one. From planning, implementation to monitoring and evaluation, there are three elements that are important.

The paper identified three Cs for a successful online collaboration. It is important that members of the collaborative program should have clear idea and understanding of the goals or commitment so that the collaboration would be successful.

In achieving the goal, it is important to have efficient coordination of the activities. Schedules, tasks, activities and output should be explained clear. Constant monitoring is also necessary to minimize problems.

Communication is equally important since it includes the tools that are used to ensure that collaboration is successful. Synchronous and asynchronous forms or communication are important for coordination.

Finally, members of a collaborative activity are not only tasked to deliver a certain goal, but they are also expected to learn from the whole process. The interplay of knowledge, experiences and culture provides a very rich outcome to the members of the team. They learn how to work together and appreciate the value of teamwork. Moreover, they also understand the value of intercultural communication.

References:

Palloff Rene, M. and Pratt K. (2005). Learning Together in Community: Collaboration Online, *20th Online Conference on Distance Teaching and Learning*. Retrieved 14 April 2011 from http://www.oakland.k12.mi.us/Portals/0/Learning/04_1127.pdf.

Siemens, G. (2005). Connectivism: Learning Theory for the Digital Age. International Journal of Instructional Technology and Distance Learning, 2(1), January 2005. Retrieved 03 March 2011, from http://www.itdl.org/Journal/Jan_05/index.htm

About the Author

Juvy Lizette Gervacio, is Assistant Professor, Master of Public Management Program, Faculty of Management and Development Studies, University of the Philippine Open University. She is also Project Coordinator and Course Manager of the eLearning Development and Implementation (eLDI) Asia and e-skills Asia. These programs are jointly implemented by the UPOU and German International Cooperation (GiZ).

She facilitates face- to-face workshops on elearning in Germany, Egypt, Vietnam, Mongolia and the Philippines; and tutored online courses to members of partner networks in Africa, Latin America, and Caucasus region.

She has also presented her experiences on managing online courses at the Online Educa Berlin and regularly attends the yearly event. In 2010, her paper entitled: "Tutors and Learners Without Borders: In a Relationship but it's Complicated" won silver award for Best Paper at the Asian Association of Open Universities Conference in Hanoi, Vietnam.

Ms. Gervacio is also a member of the Advisory Committee of the European-based Open ECB-Check (Quality label for e-learning in capacity building/development).

She finished her Master of Public Management from the University of Potsdam, Germany in 2000, and Master of Arts in Demography from the University of the Philippines. She also obtained her Bachelor of Arts in Social Science from the University of the Philippines- Baguio.

juvylizette.gervacio@upou.edu.ph

The Impact of Smaller and Larger Online Group Conferences on Student Achievement

Stafford A. Griffith
Jamacia

Abstract

This paper reports on a study undertaken with 24 students enrolled in a graduate course taught online as part of a Master of Education degree programme. The purpose was to ascertain whether the use of smaller cooperative learning groups of students would result in higher levels of achievement compared with larger cooperative learning groups. The study utilised a counterbalanced design which rotated students assigned to smaller and larger cooperative learning groups for the first and second half of the one-semester course. The difference between the mean achievement scores of students in the two types of groups was analysed using a t-test of significance. In order to examine whether there was any gender difference in achievement based on type of group, the difference between the mean achievement of males and females in smaller and larger cooperative learning groups was also analysed using a t-test of significance. No significant difference was found in the mean performance of students in smaller and larger cooperative learning groups. Neither was any significant difference found in gender achievement in the two types of cooperative learning groups. The findings raise questions about whether there was any additional benefit to be derived from reducing the size of cooperative learning groups.

Keywords: University; online instruction; online learning; cooperative learning; cooperative learning groups; small groups; gender; social interdependence; participation; research design.

Introduction

The School of Education, University of the West Indies, offers graduate courses and programmes both face to face and online. A course or programme may be offered in either, or both, of these modes. The use of cooperative learning groups in delivering the online courses is considered to be one of the effective ways of assisting students to optimise their learning. This is in keeping with the social interdependence theory which predicts that individuals working in a cooperative group will have higher levels of achievement than individuals working alone (Deutsch, 1949, 1962; Johnson & Johnson, 1989; Johnson & Johnson, 2009). This study sought to ascertain whether additional benefits would be derived from smaller cooperative learning groups compared with larger ones.

Review of the Literature

The use of computer-mediated communication as a teaching and learning tool has increased dramatically in recent years (Li, 2002). The prospect of actually earning a degree without travelling to a campus has opened up enormous possibilities for a large number of students (Braun, 2008). A 2010 Sloan Consortium report revealed that in the United States alone, over 4.6 million students were taking at least one online course during the fall term of 2008 (Allen & Seaman, 2010).

With the rapid growth in the number of online course offerings, many studies have been focussing on the effectiveness of this delivery mode (Carswell, Thomas, Petre, Price & Richards, 2000; Chao, Saj & Hamilton, 2010; Coates & Humphreys, 2001; Eom, Wen, & Ashill, 2006;

Fjermestad, 2004; Gretes & Green, 2000; Koenig, 2010; Ogunleyle, 2010; Tinnerman, 2006). Cooperative learning has emerged as an important instructional method for effective online learning.

The term cooperative learning is often used interchangeably in the literature with that of collaborative learning (Resta & Laferrière, 2007; Shibley & Zimmaro, 2002; Tschannen-Moran & Woolfolk Hoy, 2000). This often creates some confusion. However, Roschelle and Teasley (1995) explained that "collaboration" is distinguished from "cooperation", the critical difference is that cooperative work is accomplished by the division of labour among participants where each person is responsible for a portion of the problem solving while collaboration involves the mutual engagement of participants in a coordinated effort to solve the problem together.

Cooperative learning involves a structured process that requires learners to work together on a particular task, and in doing so, share information and encourage and support each other (Coppola, 1996; Slavin, 1986). The teacher designs the exercises, activities, experiences or problems that the learners must engage. These are often well structured and may include objectives, time constraints, detailed formats for presentations, and even evaluation guidelines for undertaking the task (Cranton, 1996).

In essence, therefore, cooperative learning emphasizes the accomplishment of the task through a division of labour. The experience is fairly structured and the teacher remains in control of the content and procedures. In collaborative learning, the emphasis is more on the process of working together to develop a shared understanding. The teacher establishes the circumstances or environment for the group process and participates in it. Both collaborative and cooperative learning share a number of commonalities, one of which is that students participate in the learning activities in small groups and work together to maximise their own and each other's learning (Johnson & Johnson, 1996).

In the cooperative learning approach, each member of the group is assigned a role so as to organise the responsibilities of each person towards accomplishing the given task (Lyon, 2002). The instructor explains the task to be undertaken, maintains group interaction, and provides assistance in overcoming academic-related problems as the group seeks to accomplish the task (Felder, 1996). The cooperative group is considered most useful in cases where the acquisition of basic knowledge is a primary objective (Blosser, 1993).

Three important types of learning groups have been identified by Johnson, Johnson and Smith (1991): informal cooperative learning groups which involve the ad hoc or temporary assignment of students together, within a single class session; formal cooperative learning groups which are teams established to complete a specific task, working together for one or several class sessions; and base groups which are long-term groups, usually existing over the course of a semester, providing members with support, encouragement, and assistance in completing course requirements. In a study of student participation in an online graduate course, Griffith (2009) noted that the groups to which students were assigned exemplified the combined attributes of the three types of groups. Although students were assigned to groups for the duration of the course and performed the functions of the base group as previously described, they also served the functions identified for the formal learning group in working together over a period to complete, jointly, specific tasks and assignments. Additionally, they engaged in activities associated with the informal group by working within specific class sessions to focus on materials to be learned and to undertake the other related activities of the informal learning group. Griffith (2009) posited that the classification of cooperative learning groups as either formal, informal or base groups may be more relevant to groups that are involved in a course delivered face to face than to groups established for online delivery that might well assume attributes of more than one of the three aforementioned types of groups.

There is general agreement in the literature that small group size is an essential characteristic of collaborative and cooperative learning. Small groups allow members to participate freely, by contributing their ideas and benefitting from critical responses which conduce to effective learning (Althauser & Matuga, 1998). In the literature reviewed, the number of learners recommended for the cooperative learning group varied, ranging from 20 to 3 (Brown & Atkins, 1988; Bennett, Howe & Truswell, 2002; Ngeow, 1998).

Ngeow (1998) recommended learning groups of between three and five. Following a review of the pertinent literature on group size, Bennett, Howe and Truswell (2002) concluded that "it seems that groups of three to six are the most widely advocated" (p. 9). Steeples, Goodyear and Mellar (1994), in a study of the use of computer-mediated communication in learning in Higher Education noted that even when students were assigned to large groups, they spontaneously set up smaller conferences. It would be useful to ascertain whether learning groups of three to five students as recommended by Ngeow (1998) produced levels of achievement greater than those with larger numbers as this may have implications for the adoption of practices that optimise student learning in online programmes.

Social interdependence theory clearly predicts that cooperative learning groups will have higher levels of achievement than individuals working individualistically (Bertucci, Conte, Johnson & Johnson, 2010; Deutsch, 1962; Johnson & Johnson, 1989). But, as Bertucci, Conte, Johnson and Johnson (2010), explained, "the theory does not consider the size of the group important" (p. 257). There is some research evidence to suggest that as the cooperative learning group increases, the higher the level of achievement. Seta, Paulus and Schkade (1976), for example, found that groups of four performed at a higher level than groups of two. However, Bertucci et al. (2010) posit that increasing the size of the cooperative learning group is likely to lead to declining levels of achievement. According to the authors:

> Given the problems of group members' level of social skills, the interference between teamwork and taskwork, and the degree of members' loafing, it may be expected that as the size of the group increases, the lower the group members' achievement will be.
> (p. 259)

Bertucci et al. (2010) reported on a study which sought, inter alia, to examine the effects of group size on achievement. The sample for the study comprised 31 males and 31 females seventh-grade students. Nine males and 9 females were assigned to individualistic learning conditions; 10 males and 10 females were assigned to work in pairs and 12 males and 12 females were assigned to work in groups of four. Students' achievement was assessed at the end of each of three curriculum units. It was found that cooperative pairs and cooperative groups of four achieved significantly higher than individuals working alone. This was in keeping with social interdependence theory and the expectations of the researchers. However, it was found that, contrary to the expectations of the researchers, students working in groups of four did not achieve higher results than students working in pairs. The authors concluded that "at the end of the study, group size did not seem to influence the relationship between cooperation and achievement" (p. 267).

The groups of interest in the study undertaken by Bertucci, Conte, Johnson and Johnson (2010) comprised two and four students, respectively. But would learning groups that that are constituted differently provide results that are different?

A study Egerbladh and Sjödin (1981) which included the examination of retention levels among individuals, dyads and triads found that there was no significant different in retention levels for those who had worked in different groups. Jackson (1980) also reported no statistically significant difference in achievement levels of large and small groups. Here, the groups were made up of two, four, six and eight students, respectively. Additionally, a meta-analysis of within-class

grouping (Lou et al., 1996), found no difference in achievement for groups of 6 to 10, compared with ungrouped classes which constituted larger groupings.

There is a growing but inconclusive body of literature on gender and achievement in learning groups. A few studies point to the fact that gender can have an impact on achievement in small groups (Denessen, Veenman, Dobbelsteen & Van Schilt, 2008; Wood, 1987; Webb, 1984). Although Wood (1987) found that all-male groups performed better than all-female groups, Denessen et al. (2008) found evidence that girls in small groups outperformed boys.

Myaskovsky, Unikel, and Dew (2005) found that the performance of mixed-gender and same-gender groups was equally good while Harskamp, Ding and Suhre (2008), found that males outperformed females in mixed-gender pairs. Given the inclusive nature of the findings of the research on gender and achievement in groups, Denessen et al. (2008) concluded that:

> Researchers need to study gender effects on group functioning and achievement to clarify the mixed empirical findings on this topic in which boys sometimes outperform girls…, girls sometimes outperform boys…, and researchers have found no statistically significant differences….(p. 380)

Research Questions

The purpose of this research was to ascertain whether smaller cooperative learning groups of students would produce higher levels of achievement compared with larger cooperative learning groups. The researcher was also interested in whether gender would affect achievement in smaller and larger cooperative learning groups.

The following three research questions guided this study:

1. Is there a significant difference in the achievement levels of students participating in an online course through smaller cooperative learning groups compared with those participating through larger cooperative learning groups?

2. Is there a significant difference in the achievement levels of male and female students participating in an online course through *smaller* cooperative learning groups?

3. Is there a significant difference in the achievement levels of male and female students participating in an online course through *larger* cooperative learning groups?

Procedures

Sample

All 24 students in the Master of Education programme taking the online course in *Issues in Internal Assessment* in the January to May, 2009 semester, were included in the study. The entire course was delivered asynchronously over a 13 week period through web-based communication. The students who participated in the course were connected, remotely, from locations in seven different Caribbean countries: Antigua and Barbuda, British Virgin Islands, Cayman Islands, Dominica, Jamaica, St. Vincent and the Grenadines, and Trinidad and Tobago. All 24 students had participated in at least two online courses in the previous semester.

Method

Prior to the start of the course, each student was provided with two critical resource documents. These were (i) a 168-page research report on *Practices, Problems and Proposals of School Based Assessment* by Desmond Broomes and (ii) a 271 page *Study Guide and Resource Manual for Issues in Internal Assessment* prepared by the instructor. Part I of the latter document contained a description of the course, including rationale, objectives, content, schedule, teaching methods,

course assessment and prescribed and recommended readings. Part II contained a collection of materials from various published and non-published sources which, collectively, covered the content and objectives of the course.

The course was defined as a 39-hour, 3-credit graduate course. It comprised five Units, each of which was subdivided into a number of topics or issues. The duration of a Unit varied between two and three weeks, depending on its level of demand.

The instructor devoted a significant proportion of the time during the first week to the clarification of how students were assigned to smaller and larger groups for the first and second half of the course. The remaining time during the first week was devoted to an instructor-led conference aimed at revising critical concepts covered in a previous course in *Educational and Psychological Measurement* which was a pre-requisite for the course in *Issues in Internal Assessment*.

A counterbalanced design was used in this study. The 24 students in the class were divided into six Clusters, each comprising four students. These Clusters were labelled 1A, 1B, 1C, 2A, 2B and 2C. Clusters 1A, 1B, 1C were assigned to smaller group conferences for the first half of the course and to larger group conferences for the second half of the course. On the other hand, Clusters 2A, 2B and 2C were assigned to larger group conferences for the first half of the course and to smaller group conferences for the second half of the course.

Essentially, four conferences were set up for the first half, or Part I, of the course. Three of the four conferences were smaller group conferences to which Clusters 1A, 1B and 1C were separately assigned. The fourth was a larger group conference to which Clusters 2A, 2B and 2C were assigned as a single, combined group. As was the case for the first half of the course, four conferences were set up for the second half, or Part II, of the course. Three of these conferences were smaller group conferences to which Clusters 2A, 2B and 2C, respectively, were separately assigned, having been rotated from the larger group conference to which they had been assigned for Part I of the course. Clusters 1A, 1B and 1C were assigned to the fourth conference as a single, combined group, having been rotated from the smaller group conferences to which they had been separately assigned for Part I of the course. Table 1 summarises the allocation of Clusters to smaller and larger groups for Parts I and II of the course.

Table 1
Allocation of Clusters to Smaller and Larger Groups
for Parts I and II of the Course

Part	Week No.	Cluster	Assignment
I	2 - 7	1A, 1B, 1C	Small Group
		2A, 2B, 2C	Large Group
II	8 - 13	2A, 2B, 2C	Small Group
		1A, 1B, 1C	Large Group

Student Moderators were used for all conferences. The Moderator was required to provide guidance by identifying the particular focus to be pursued. In this role, the Moderator posed questions to guide the online discussion and stimulated and encouraged discussion on the topic under consideration. The reliance on student Moderators has received much support in the literature (Griffith, 2009; Hara, Bonk & Angeli, 2000; Leh, 2000; Poole, 2000; Tagg, 1994; Veen, Lam & Taconis, 1998). Following a review of the

research literature, Seo (2007) noted that "student moderators can lead discussions more effectively and foster greater student comprehension than the instructor because student moderators better understand their peers' way of thinking" (p. 22).

For the larger group conferences, the Moderator was drawn from one of the three Clusters comprising the group. The other three members of the Cluster, from which the Moderator was drawn, served as Researchers. All eight members of the other two Clusters in the larger group conferences served as Discussants. The Researchers were required to find and post relevant materials, including materials from various websites and to give a summary of their content and their importance to the topic under discussion. The Discussants were each required to participate, fully, in the discussions by responding to the Moderator's questions, making contributions to advance the discussions, and commenting on the contributions of other participants.

For the Clusters in the smaller group conferences, one of the four members served as the Moderator while the other three assumed the combined roles of Researcher and Discussant.

At the end of Part I of the course, students were given a 30-item four-option multiple-choice test constructed by the instructor to measure achievement on that part of the course. At the end of Part II of the course, a similar test, measuring achievement on the second part of the course, was administered. Given the nature of the design used in the study, each of the 24 students obtained test scores as a participant in a smaller group conference and as a participant in a larger group conference.

Results

This study was concerned with whether there was a significant difference between the achievement levels of students in smaller cooperative learning groups and those in larger cooperative learning groups. It was concerned, as well, with whether gender affected performance in smaller and larger groups. The study was not concerned with whether students performed better in Part 1 or Part II of the test.

Under the circumstances, the primary interest of the researcher was in the means of the scores obtained by students when participating in (a) smaller cooperative learning groups and (b) larger cooperative learning groups. Given the concern about gender performance, the researcher was also interested in the means of scores of male and female students participating in (a) smaller cooperative learning groups and (b) larger cooperative learning groups.

The 24 students in the class comprised 8 males and 16 females. The combined Clusters 1A, 1B and 1C, accounted for 5 of the 8 males, while the combined Clusters 2A, 2B and 2C, accounted for the other 3. Seven of the 16 females were included in the combined Clusters 1A, 1B and 1C while the other 9 were included in the combined Clusters 2A, 2B and 2C. Table 2 summarises the distribution of the scores of the 24 students, by gender, when they participated in the smaller and larger cooperative learning groups.

The Cluster ID's shown in Tables 2 were designed to link students to the Clusters to which they were assigned. For example, 1A/1 represents student number 1 in Cluster 1A while ID 2C/4 represents student number 4 in Cluster 2C (see Table 1 for a summary of how Clusters of students were allocated to smaller and larger groups for each Part of the course).

Table 2
Distribution of Scores Obtained for Parts I and II of the Course
by Students Participating in Smaller and Larger Group Conferences

Tests	Gender	Students in Smaller Group Conferences		Students in Larger Group Conferences	
		Cluster ID	Score Obtained	Cluster ID	Score Obtained
Part I of Course	Male	1A/1	26	2A/1	25
		1B/1	28	2C/1	28
		1B/2	27	2C/2	26
		1B/3	30		
		1C/1	29		
	Female	1A/2	26	2A/2	26
		1A/3	25	2A/3	25
		1A/4	26	2A/4	30
		1B/4	24	2B/1	28
		1C/2	25	2B/2	29
		1C/3	30	2B/3	26
		1C/4	26	2B/4	29
				2C/3	26
				2C/4	26
Part II of Course	Male	2A/1	13	1A/1	16
		2C/1	20	1B/1	17
		2C/2	17	1B/2	18
				1B/2	19
				1C/1	21
	Female	2A/2	22	1A/2	13
		2A/3	14	1A/3	18
		2A/4	23	1A/4	20
		2B/1	20	1B/4	15
		2B/2	18	1C/2	17
		2B/3	15	1C/3	21
		2B/4	19	1C/4	24
		2C/3	16		
		2C/4	22		

Table 3 shows the means and standard deviations of achievement scores, by gender, for students who participated in the smaller and larger cooperative learning group conferences in the online

course. The overall mean score of 22.54 and related standard deviation of 5.13 for the students when they participated in the smaller cooperative learning groups do not appear to be much different from the overall mean score of 22.21 and related standard deviation of 5.35 for students when they participated in the larger cooperative learning groups.

Table 3
Mean and Standard Deviation of Achievement Scores by Gender for Students Participating in Smaller Group and Larger Group Conferences

		Mean	SD	Mean	SD	Mean	SD
Smaller Group	Male	28.00	1.58	16.67	3.51	23.75	6.27
	Female	26.00	1.92	18.78	3.27	21.94	4.57
	Total	26.83	1.99	18.25	3.31	22.54	5.13
Larger Group	Male	26.33	1.53	18.20	1.92	21.25	4.53
	Female	27.22	1.79	16.86	3.02	22.69	5.79
	Total	27.00	1.71	17.42	2.61	22.21	5.35

The overall mean 23.75 and standard deviation of 6.27 for the males when participating in the smaller cooperative learning group conferences showed marginal differences from the mean of 21.94 and standard deviation of 4.57 obtained for females when participating in similar conferences. Based on a consideration of the means in particular, it may be concluded that, in the smaller cooperative learning groups, males achieved marginally higher than females.

However, the obverse may be concluded for the larger cooperative groups based on the overall means of male and female achievement in that group. In the larger learning groups, females achieved marginally higher than males. The mean and standard deviation of scores for females were 22.69 and 5.79, respectively, while for males they were 21.25 and 4.53, respectively.

Further analyses were undertaken specifically to test the significance of differences between the means obtained for the variables of interest. More particularly three null hypotheses were tested:

1. There is a no significant difference between the mean scores of students who participated in the smaller cooperative learning groups and those who participated in the larger cooperative learning groups.

2. There is no significant difference between the mean scores of male and female students who participate in the *smaller* cooperative learning groups.

3. There is no significant difference between the mean scores of male and female students who participate in the *larger* cooperative learning groups.

A t-test of the significance of the difference between each of the pairs of means of interest was undertaken with the aid of Microsoft Office Excel 2007. Black (2005, p. 406), pointed to the usefulness of the t-test which was devised for testing differences between means for small samples of less than 30. The test of homogeneity of variance (based on the F-distribution) for the distribution of scores that yielded the pairs of means which were compared in this study indicated

that they were sufficiently homogenous (p > .05) to use the t-test unaltered (see Black, 2005, p. 419).

The results are the t-tests for the difference between the overall mean scores of students who participated in the smaller cooperative learning groups and those who participated in the larger cooperative learning groups are presented in Table 4. The table shows a calculated t-value of 0.22 which is less than the critical t-value of 2.01 for the two-tailed test and a p-value of 0.83 which far exceeds the α of 0.05 set for the test of significance. This clearly indicates that the first hypothesis which states that there is no significant difference between the means cannot be rejected.

Table 4
Test of Significance of Difference between Mean Achievement of Students in Smaller and Larger Cooperative Learning Groups

	Smaller Group	Larger Group
Mean	22.54167	22.20833
Variance	26.34601	28.60688
Observations	24	24
Pooled Variance	27.47645	
Hypothesized Mean Difference	0	
df	46	
t Stat	0.220287	
P(T<=t) one-tail	0.413311	
t Critical one-tail	1.67866	
P(T<=t) two-tail	0.826622	
t Critical two-tail	2.012896	

The procedures followed in testing the significance of the difference between the mean scores of male and female students who participated in the smaller cooperative learning groups were similar to those followed in testing the significance of the difference between the overall means obtained for students who participated in the smaller and larger cooperative learning groups. The results are presented in Table 5.

The calculated t-value of 0.81 is less than the critical t-value of 2.07 and the p-value of 0.43 for the two-tailed test far exceeds the α of 0.05. Therefore, the hypothesis that there is no significant difference between the means cannot be rejected.

Table 5
Test of Significance of Gender Difference in Achievement
for Students in Smaller Cooperative Learning Groups

	Male	Female
Mean	23.75	21.9375
Variance	39.35714	20.8625
Observations	8	16
Pooled Variance	26.74716	
Hypothesized Mean Difference	0	
df	22	
t Stat	0.809354	
P(T<=t) one-tail	0.213489	
t Critical one-tail	1.717144	
P(T<=t) two-tail	0.426979	
t Critical two-tail	2.073873	

The procedures followed in testing the significance of the difference between the mean scores of male and female students who participated in the larger cooperative learning groups, were similar to those followed for the other two hypotheses. The results are provided in Table 6.

Table 6
Test of Significance of Gender Difference in Achievement
for Students in Larger Group Cooperative Learning Groups

	Male	Female
Mean	21.25	22.6875
Variance	20.5	33.5625
Observations	8	16
Pooled Variance	29.40625	
Hypothesized Mean Difference	0	
df	22	
t Stat	-0.61219	
P(T<=t) one-tail	0.273343	
t Critical one-tail	1.717144	
P(T<=t) two-tail	0.546687	
t Critical two-tail	2.073873	

Again, the calculated t-value of -0.61 is less than the critical t-value of 2.07 and the p-value of 0.55 for the two-tailed test far exceeds the set α of 0.05. Therefore, the hypothesis that there is no significant difference between the means cannot be rejected.

Discussion

This research sought to ascertain whether students in a smaller cooperative learning group would perform better than students in a larger cooperative learning group. The level of achievement of cooperative learning groups of four students was compared with that of groups of 12. The findings suggest that there was no significant difference in the achievement levels of the larger and smaller cooperative learning groups. The findings further suggest that gender achievement was not affected by group size.

The findings of this study are in sync with those of the Bertucci, Conte, Johnson and Johnson (2010) who found that group size did not affect achievement: students working in groups of four did not achieve higher results than students working in pairs. These findings accord, as well, with that of a number of other studies which considered the effects of group size on achievement levels in different settings. These include the work of Jackson (1980) who reported no statistically significant difference in achievement levels of large and small groups and Egerbladh and Sjödin (1981) who found that there was no significant different in retention levels for those who had worked in groups of different sizes.

The findings concerning the impact of group size on gender achievement was inconclusive. The small gender differences found were not significant. Denessen et al. (2008) pointed to the inconclusiveness of research on gender and achievement in groups - boys outperform girls in some instances while in others girls outperform boys and "researchers have found no statistically significant differences" (p. 380). In this study, no statistically significant differences were found.

Conclusion and Recommendations

The current study supports the findings of a number of earlier studies that the size of the cooperative learning group does not affect achievement. It adds to the inconclusive nature of the findings on gender and achievement in groups – this time due to the lack of significance of the small gender differences observed.

There is evidently the need for additional research that will help to shed further light on the relationship between size of the cooperative learning group and levels of achievement. This is particularly important for online learning in higher education where cooperative learning groups are frequently organized on the understanding that they will help to improve student learning. The challenge is to find out what size of group will optimise learning and whether gender is a factor in to be considered.

The current study was undertaken with a sample of 24 students in a single graduate course offered in one semester. The number of females in the two counterbalanced groups used in the study was much larger than the number of males. The size of the sample would no doubt have affected the stability of the variance between small and large group achievement, and between male and female achievement. It is often challenging to find large classes for graduate courses in many university settings. Nevertheless, more comprehensive studies with larger samples would generate more stable variances and allow for more conclusive results. Effort should be made to undertake such studies. It may be useful to continue the probe of the relationship between group size and gender achievement. The small, but non-significant, gender difference in achievement associated with group size that was noted in this study signals the need for such additional research.

References

Allen, I., & Seaman, J. (2010). *Learning on Demand: Online Education in the United States*. Babson Park MA: Babson College Survey Research Group.

Althauser, R., & Matuga, J. M. (1998). On the pedagogy of electronic instruction. In C. J. Bonk & K. S. King (Eds.), *Electronic Collaborators: Learner Centered Technologies for Literacy, Apprenticeship, and Discourse* (pp. 183-208). Mahwah, NJ: Lawrence Erlbaum.

Bennett C., Howe C., & Truswell E. (2002). Small group teaching and learning in psychology. *Report and Evaluation Series No. 1*. York: LTSN Psychology, University of York.

Bertucci, A., Conte, S., Johnson, D. W., & Johnson, R. T. (2010). The impact of size of cooperative groups on achievement, social support, and self-esteem. *The Journal of General Psychology,* 137 (3), 256-272.

Black, T.R. (2005). *Doing quantitative research in the social sciences: An integrated approach to research design, measurement and statistics*. London: Sage Publications.

Blosser, P. E. (1993). *Using Cooperative Learning in Science Education*. Columbus, OH:ERIC/Clearinghouse on Science, Mathematics and Environmental Education.

Braun, T. (2008). Making a Choice: The perceptions and attitudes of online graduate students. *Journal of Technology and Teacher Education, 16 (*1), 63-92.

Brown, G., & Atkins, M. (1988). *Effective Teaching in Higher Education.* London: Routledge.

Carswell, L., Thomas, P., Petre, M., Price, B., & Richards, M. (2000). Distance education via the internet: The student experience. *British Journal of Educational Technology,* 31(1), 29-46.

Chao, I. T., Saj, T., & Hamilton, D. (2010). Using collaborative course development to achieve online course quality standards. *International Review of Research in Open and Distance Learning*, 11 (3), 106-126.

Coates, D., & Humphreys R. B. (2001). Evaluation of computer-assisted instruction in principles of economics. *Educational Technology & Society*, 4 (2), 133-144.

Coppola, B. P. (1996). Progress in practice: Exploring the cooperative and collaborative dimensions of group learning. *The Chemical Educator*, 1996, 1 (1), 3.

Cranton, P. (1996). Types of group learning. In S. Imel (Ed.), *Learning in groups: Exploring Fundamental Principles, New Uses, and Emerging Opportunities* (pp. 25-32). New Directions for Adult and Continuing Education, 71. San Francisco: Jossey-Bass.

Denessen, E. , Veenman, S. , Dobbelsteen, J. and Van Schilt, J. (2008). Dyad composition effects on cognitive elaboration and student achievement. *Journal of Experimental Education* 76 (4), 363-386.

Deutsch, M. (1949). A theory of cooperation and competition. *Human Relations*, 2, 129-152.

Deutsch, M. (1962). Cooperation and trust: Some theoretical notes. In M.R. Jones (Ed.), Nebraska symposium on motivation (pp. 275-319). Lincoln, NE: University of Nebraska Press.

Egerbladh, T., & Sjödin, S. (1981). Group Problem Solving: Ability Level, Group Size, and Subsequent Individual Performance. *The Journal of General Psychology*, 105 (1), 3-12.

Eom, S., Wen, H., & Ashill, N. (2006). The determinants of students' perceived learning outcomes and satisfaction in university online education: An empirical investigation. *Decision Sciences Journal of Innovative Education*, 4 (2), 215-235.

Felder, R. M. (1996). Active-inductive-cooperative learning: An instructional model for chemistry? *Journal of Chemical Education*, 73, 832-836.

Fjermestad, J. (2004). An analysis of communication mode in group support systems research. *Decision Support Systems,* 37 (2), 239-266.

Gretes, J. A., & Green, M. (2000). Improving undergraduate learning with computer-assisted assessment. *Journal of Research on Computing in Education*. 33 (1), 46-56.

Griffith, S. A. (2009). Assessing student participation in an online graduate course. International *Journal of Instructional Technology and Distance Education,* 6 (4), 35-44.

Hara, N., Bonk. C. J., & Angeli, C. (2000). Content analysis of online discussion in an applied educational psychology course. *Instructional Science,* 28, 115-152.

Harskamp, E., Ding, N., & Suhre, C. (2008). Group composition and its effect on female and male problem-solving in science education. *Educational Research,* 50 (4), 307-318.

Jackson, A. (1980). The effect of group size on individual achievement in beginning piano classes. *Journal of Research in Music Education*, 28 (3), 162-166.

Johnson, D. W., & Johnson, R. T. (1989). *Cooperation and competition: Theory and research*. Edina, MN: Interaction Book Company.

Johnson, D. W., & Johnson, R. T. (1996). Conflict resolution and peer mediation programs in elementary and secondary schools: A review of the research. *Review of Educational Research, 66 (4),* 459-506.

Johnson, D. W., & Johnson, R. T. (2009). An educational psychological success story: Social interdependence theory and cooperative learning. *Educational Researcher*, 38 (5), 365-379.

Johnson, D., Johnson, R., & Smith, K. (1991). *Cooperative Learning : Increasing College Faculty Instructional Productivity*, ASHE-ERIC Higher Education Report 4, Washington, D. C.: George Washington University.

Koenig, R. J. (2010). Faculty satisfaction with distance education: A comparative analysis on effectiveness of undergraduate course delivery modes. Journal of College Teaching and Learning, 7 (2) 17 – 24.

Leh, A. (2000). Action research on hybrid courses and their online communities. *Educational Media International, 39*, 31-38.

Li, Q. (2002). Exploration of collaborative learning and communication in an educational environment using computer-mediated communication. *Journal of Research on Technology,* 34 (4), 503 – 516.

Lou, Y. P., Abrami, P. C., Spence, J. C., Poulsen, C., Chambers, B., & d'Apollonia, S. (1996). Within-class grouping: A meta-analysis. *Review of Educational Research,* 66 (4), 423-458.

Lyon, D. C. (2002). Achievement through small-group discussion sessions in large general chemistry lecture classes with the aid of undergraduate peer teaching assistants. Unpublished Doctoral Dissertation, The University of Texas at Austin.

Myaskovsky, L, Unikel, E., & Dew, M. (2005). Effects of gender diversity on performance and interpersonal behavior in small work groups. *Sex Roles, 52* (9/10), 645-657.

Ngeow, K. (1998). *Enhancing student thinking through collaborative learning*. ERIC Digest, ERIC Clearinghouse on Reading English and Communication Bloomington IN, ED422586.

Ogunleyle, A. O. (2010). Evaluating an online learning programme from student's perspectives. Journal of College Teaching and Learning, 7 (1), 79-89.

Poole, D. (2000). Student participation in a discussion-oriented online course: A case study. *Journal of Research on Computing in Education,* 33, 162-177.

Resta P., & Laferrière T. (2007). Technology in support of collaborative learning. *Educational Psychology Review*, 19 (1), 65-83.

Roschelle, J., & Teasley, S. (1995). The construction of shared knowledge in collaborative problem solving. In C.E. O'Malley (Ed.), *Computer Supported Collaborative Learning* (pp. 69-97). Heidelberg: Springer-Verlag.

Seo, K. K. (2007). Utilizing peer moderation in online discussions: Addressing the controversy between teacher moderation and nonmoderation. *The American Journal of Distance Education* 2 *(1)*, 21-36.

Seta, J. J., Paulus, P. B., & Schkade, J. K. (1976). Effects of group size and proximity under cooperative and competitive conditions. *Journal of Personality and Social Psychology*, 34, 47–53.

Shibley, I, A., & Zimmaro, D. M. (2002). The influence of collaborative learning on student attitudes and performance in an introductory chemistry laboratory. *Journal of Chemical Education,* 79 (6), 745-748.

Slavin, R. (1986). *Using student team learning*. Baltimore: Centre for Research on Elementary and Middle Schools, John Hopkins.

Steeples, C., Goodyear, P. & Mellar, H. (1994). Flexible learning in higher education: The use of computer-mediated communications. *Computer & Education,* 22 (1-2), 83-90.

Tagg, A.C. (1994). Leadership from within: Student moderation of computer conferences. *The American Journal of Distance Education,* 8 (3), 40-50.

Tinnerman, L. (2006). A comparative study between traditional and distance education instructional environments involving two graduate level learning disabilities classes. *International Journal of Instructional Technology and Learning,* 3 (3), 1-64.

Tschannen-Moran, M. & Woolfolk Hoy, A. (2000). Collaborative learning: A memorable model. *The Teacher Educator,* 36 (2)*,* 148-165.

Veen, W., Lam, I., & Taconis, R. (1998). A virtual workshop as a tool for collaboration: Towards a model of telematic learning environments. *Computers in Education,* 30, 31-39.

Wood, W. (1987). Meta-analytic review of sex differences in group performance. *Psychological Bulletin*, 102 (1), 53-71.

Webb, N. M. (1984). Sex differences in interaction and achievement in cooperative small groups. *Journal of Educational Psychology,* 76 (1), 33–44.

About the Author

Stafford A. Griffith is Professor of Research, Measurement and Evaluation in the School of Education at the Mona Campus (Jamaica) of the University of the West Indies. Professor Griffith holds graduate degrees in education with specialized study in research, measurement and evaluation, and curriculum development. He also holds a LL.B. degree. Professor Griffith has approximately 42 years of combined work experience in teaching, curriculum development, measurement and evaluation, and programme planning and management. He previously served as Pro-Registrar of the Caribbean Examinations Council. Professor Griffith's research interests include public examinations, large scale testing programmes, formative assessment, assessment in a constructivist learning environment and online learning.

E-Mail: drstaff@yahoo.com

Quality Assurance and Open Educational Resources in Online Courseware Development and Delivery

Mohammad Issack SANTALLY
Mauritius

Abstract

Open Educational Resources (OERs) are gaining momentum in education and throughout diverse academic communities. However, the quality element is still a concern for many. This article discusses the quality element with respect to the courseware design, development and delivery when OERs are used. A case study of a course is presented and it is argued that the quality element with respect to OERs encompasses much more than the mere quality assurance of the content that is being available. The issue of quality needs to be addressed in the broader quality assurance framework for courseware development.

Introduction

The issue of quality assurance (QA) has increasingly become a priority for Higher Education institutions. As universities compete to attract more students, but also to attract financing through various projects, quality represents one of the main criteria for ensuring a significant share of the educational market (Abdous 2009, p. 281). Guaranteeing quality, however, is not always an easy process, first and foremost because the very concept of "quality" is disputed and many different, contextual definitions are used (Mihai 2009).

The main barrier to such an innovative way of using OERs to reconceptualise the educational process in traditional universities are the quality assurance procedures that need to be 'strictly' followed. In a traditional lecture, quality is believed to be maintained if the lecturer spends 3 hours in the classroom irrespective of what he does or not. This is proved by the log book in which he signs. In another context, quality is maintained if students' results follow the normal distribution and if academic/administrative records related to the course are duly kept. Furthermore, quality is considered maintained if feedback forms are given, at the end of the semester, to students who fill in most of the time in a subjective way. This perspective of viewing quality poses a problem for bringing innovation and creativity in the learning process. Quality is a non-referential concept and quality assurance techniques that are applicable in behaviorist learning environments are not compatible in socio-constructivist ones. The quality framework that can be applied depends on the learning design approach to be adopted. Quality assurance needs to be an ongoing and iterative activity and student feedback on their own learning (problems encountered, things that were easily understood, communication problems and other related issues) contribute towards making them better learners and develop the required competencies.

This paper looks at the issue of quality assurance when OERs are used for courseware development purposes. It is clear that the main issue surrounding OERs use relates to the phase when the content is being developed while the other phases will normally fall into the existing

quality assurance mechanisms of institutions. However, this perspective of viewing quality depends on the granularity of the OER being used.

An Overview of OERs

Open educational resources are defined by the Wikipedia community as being basically content, instructional approaches, activities and other resources, available for free and that are believed to be useful in educational contexts. The idea behind the concept is to promote access to education to a wider audience, especially those from deprived regions of the world, where the open resources can be freely reused, improved and repurposed to fit in different contexts. The term open educational resource was first defined 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" (Johnstone, 2005). The definition of OER now most often used is: "open educational resources are digitised materials offered freely and openly for educators, students and self-learners to use and reuse for teaching, learning and research".

Open educational resources are therefore basically learning objects which are open and which may be governed by alternate licensing standards such as Creative Commons. However, some definitions of open educational resources go beyond the classic definitions learning objects. It can basically be any resource that is available in an open access manner and that can be used in an educational context. It can be anything from a blog post to a complete website which has no relation to educational contexts, but which can indeed be repurposed to fit any context. This is precisely where the issues of quality come into light as the authenticity and integrity of such materials can hardly be verified.

While materials can be produced, published, shared and accessed by anyone at a low cost, well defined OER projects within an educational context does cost a lot in terms of funding and effort needed to build, implement and sustain those initiatives. For instance, the OpenLearn Project of the Open University in the UK had a budget of almost USD 5 million a year for the first two years (OECD, 2007). On the other hand, from the same source, it is mentioned that the OCW project of the University of the Western Cape in South Africa runs its operation with three staff and approximately USD 44000 a year. While it is important to point out that real costs can be met with resources other than money, most initiatives need to raise some money some of the time (OECD, 2007).

OERs are also available in a variety of formats and in a variety of repositories using different types of standards. Resources can be available in portable document formats (PDF), compressed formats (ZIP, RAR), hypertext and/or animation/movie formats. This variety adds both to the flexibility as well as the complexity

There are also a number of barriers that have been reported with respect to the creation, use and adoption of OERS such as lack of support from management level, lack of staff reward system, lack of skills and lack of time from the educator's community. This definitely impacts on the sustainability of OER initiatives and in the course of time leads to a decrease in the perceived quality levels of such content.

Quality in OERs

From Creation to Consumption and Dissemination

Open Educational Resources provide instructors with an innovative way to conceptualise courses. The philosophy behind it is that courseware development becomes a distributed and a split 3-phased approach. This means that the development of content can be done by anyone, anywhere and at any point in time, thus becoming the first phase of the process. The instructor involved in

the use of OERs has practically no control over this phase but has access to a range of tools than can give him access to content having been developed in that phase. A simple example would be to use a search engine to look for related content or to access OER repositories. The other phase would be to build-up the course from the content available manually or through the help of courseware building tools. The third phase would be the delivery and dissemination of the course content in a face-to-face classroom or via an e-learning platform. The instructor might have control on both phase 2 and 3 or on only one of them. This approach being an innovative way in itself, is set however to be a "disruptive process" in well-established traditional educational systems especially with respect to the quality issue.

Issues of quality in educational processes normally arise in terms of

- The content – its selection, aggregation and presentation
- The pedagogical approach used
- The delivery of the course
- Students' satisfaction, performance and acquired competencies

The most obvious issue of quality in OER-based courseware development process relates only to the content development phase on which the author has no particular control. This is where most of the concerns related to quality assurance lies. Traditionally speaking, reliable sources of academic information were only books, and published research (journal articles and conference papers) as well as from the academic's philosophical perception of things (academic freedom). With the democratisation of access to content and the removal of publishing constraints via the web, reliability of information presented in content has been of great concerns to educational authorities. In this context we wish to highlight a very simple fact that out of ten consecutive searches that were tried on different topics on Wikipedia returned a number of resources which warned on the top about the reliability of the content (information) being presented to the user. Furthermore, most searches done on Google for particular information would most likely return Wikipedia as one of the top 5 sources.

The fact that OERs came into the limelight more or less with the emergence of Web 2.0 era (contrary to the Learning Objects Concept) contributed to the significance of the concerns regarding QA issues. Therefore academics and instructors using OERs need to have a well-established set of guidelines that would provide a framework for the search and use of freely available content from the Web. De-facto trusted sites like the OpenLearn platform, Connexions and Curriki, just to name a few would greatly help but it is in fact very difficult for an institution to control such activities of their staff. One possibility would be for OERs to form an integral part of the institution's courseware development policies rather than being used on piece-meal basis by individual academics.

It is important to note that peer-reviewing has over the years proved useful in research-related quality assurance systems. With the concept of collaborative editing through wiki technologies, the concept of peer-reviewing has been very much the motor for those promoting an approach based of OER development through communities of practice. However, the issue that remains contradictive is the impersonation issue. While there are ways to counter this, sites like Wikipedia and others will definitely encounter difficulties to enforce identity checks for its users. One recent article on the web also mentioned the declining number of people who were involved in 'watching' of pages and their content on Wikipedia.

One possibility to counter the above problem is therefore to completely rethink (re-engineer) the pedagogical approaches used when designing courses using OERs. When courses are fully content-oriented, it is obvious that quality assurance processes will focus mainly on the content being used and presented to the users. However, if the content is not the central focus, but an element in a broader pedagogical scenario, then the whole quality assurance issue takes a

different perspective. The concept of project/activity-based learning that focus on the development of a set of skills and competencies by the student through socio-constructivist models can be useful. Quality assurance will in this case be a process that ensures the learning path of the learner will lead to the desired outcomes. In doing so, using a variety of available contents on the web which are labelled as OER is not a problem as the learners will develop higher order cognitive skills where they can synthesize, argue and discuss on the contents rather than adopting them to be factual information. However, again as was mentioned earlier, this different perspective can be disruptive to the traditional organisational processes of QA.

Case-Study of OER-Based Coursware and the Issue of Quality

In this section we shall describe a course on Educational Technologies developed at the University of Mauritius that incorporated OERs. We will look at how the course fit in the existing quality assurance frameworks of the university and where some adaptations were needed. To mount a course from OERs, there are two possible practices namely the bottom up approach or the top down system. In the bottom up approach the course developer has a broad idea of what he or she wants to deliver in a course and what outcomes he or she wants the learners to achieve. In this approach, the course developer will mainly look at what is available and then fine-tune his syllabus, learning outcomes and the design of the learning activities and assessment instruments accordingly. The top down system on the hand follows a more classic approach of course design where the syllabus and outcomes are duly approved by a course committee and then the course designer has to meet the specific elements that were approved beforehand. When using OERs the bottom up approach is more appropriate as it allows for flexibility in the process.

This is a foundation course targeted at students who are enrolled on bachelor programmes of the University but who have an interest in education. They might be aspiring teachers, educators or looking for a future career in an educational context. The course is not compulsory and is offered as a *general education module (GEM)*. The course has no written exams and the evaluation is done through a set of assignments consisting of a mini project, forum participation and completion of self-learning activities. The course was developed from a set of learning units selected from the OpenLearn platform of the Open University of the UK. The course was developed using the bottom up approach as describe in the paragraph above. The course was a 6-credit module spread over two semesters. This is equivalent to 90 hours of classroom teaching. The main aim of the course was to introduce learners to the basic concepts of pedagogy and the use of ICT/digital media in teaching and learning.

With this requirement in hand, the course developer tries to look for suitable content from OER repositories. Given that the University of Mauritius was during that period involved in the SIDECAP project in partnership with the Open University of the UK, the OpenLearn platform was chosen for this experiment with Open Education Resources. With respect to the four elements that constitute a 'quality framework' as per our conception of education, we try to analyse the process related to the design, development and delivery of the course on Educational Technologies in the next paragraph.

The Content – its selection, aggregation and presentation

Course development is not only about writing of content. The content is just one of the elements that constitute a course, yet a very important one. Starting with the course outline, course aims and goals as the benchmark, an in-depth analysis of related content on the OpenLearn platform is done by the course developers. Another element that is determinant in the choice of already available content is the number of learning hours of the units being selected.

The quality of content is based on a mutual trust (between the academic community) given that OpenLearn content already undergo prior phases of review (through LabSpace) before being

posted online. These reviews ensure integrity, accuracy and relevance of the content and its sources. However, when independent OpenLearn units are being selected to form part of a course, there is a need to make sure if the content of the different units are compatible and homogenous. This can be a quality issue even if the individual chunks of content are high quality since it does not necessarily guarantee the final product will be of the same standard unless compatibility and homogeneity of content is ensured.

The Pedagogical Approach Used

In a course, the content is no longer the central element. Even if a course is built from non-OER material, learners will still look for further content in libraries or online through content repositories or simple web search. The pedagogical approach used to ensure the learning outcomes are achieved is also important in determining the quality of the course. Therefore OERs can unjustly suffer from the quality debate given that OERs (in the form of content) do not necessarily contain an underlying recommended pedagogical approach. Therefore in judging the quality of an overall course, the pedagogical approach to be used depends on the type of content and vice-versa.

In the Educational Technologies course, there is no written assessment and learners are assessed purely through continuous methods such as online participation in discussion forums, completion of learning activities and a final practical mini-project where they need to develop a simple educational website. In this case, it is therefore important to choose content that will allow the learners to carry out the practical activities and to achieve the projected learning outcomes.

Course Delivery

Quality of a course is also intrinsically linked to the way it is delivered and the type and efficiency of support that learners receive. When we talk of the use of Open Educational Resources reference is usually made to the design and delivery of online courses rather than in the traditional face-to-face scenarios. Online courses need to have a well-structured course delivery plan as well as an operational framework for learner support. Without this framework, any online course irrespective of whether OERs are used or not is bound to fail and this definitely impacts on the perceived quality of the course.

The Educational Technologies online course receives an average enrolment of 150-200 students yearly. The learners have access to a number of different online support forums, regular Skype chats and a tutor is allocated for each batch of 50 learners. When using OERs it is also important that the tutors go through the course in detail prior to the delivery so as to master the different aspects of the course. Students also have access to a set of online interactive tutorials that have been developed as supplementary support materials to assist them in the learning process.

Students' Satisfaction, performance and acquired competencies

Another important element that adds credibility to the quality assurance process is the feedback obtained from the learners in terms of their satisfaction, their own perception of the quality of their learning experience, their performances in assessment activities as well as the competencies and skills acquired with respect to the targets that were initially set.

The element of student feedback throughout the course in a formative way provides better insight for course developers and tutors to know what they have got right and wrong and this gives them the opportunity to mend some issues during the course of delivery itself. Student satisfaction is also an element to be taken into account when judging the quality of a course. Student satisfaction can however be seen as a complex issue that can often be guided by subjective appraisal by learners.

In the Educational Technologies course student feedback, satisfaction, their performance and the competencies they demonstrated were taken as a holistic unit in order to get an objective

feedback on the perceived quality on the course outcomes. Throughout the course, students participate on forums, regularly enter journal reflections and carry out self-assessment as well as tutor marked activities. At the end of the course, they are asked to provide feedback in terms of answering open-ended questions rather than filling standard feedback sheets.

Conclusion

The issue of quality has been constantly raised in debates surrounding the use of OERs in education. However, it is clear that quality needs to be seen in a holistic way and needs not only focus on the content but on the learning environment as one entity that consists of the learning content, the pedagogical approaches, delivery and support mechanisms and students achievements and perception of the learning experience. We show in this article using a case study of a course that has been mounted using OERs that each of these factors discussed are interdependent and intrinsic to the preservation of the overall quality of a course.

References

Abdous, M. (2009). E-learning quality assurance: a process-oriented lifecycle model. *Quality Assurance in Education*. 17 (3). 281-295

Johnstone, S. (2005), "Open Educational Resources and Open Content, Background Note", International Institute for Educational Planning, Internet Discussion Forum on Open Educational Resources, Open Content for Higher Education.

Mihai (2009). Teaching European Studies Online: The Challenge of Quality Assurance. *European Journal of Open, Distance and e-Learning.* http://www.eurodl.org [retrieved 5 January 2011]

OECD (2007). Giving Knowledge for Free: The Emergence of Open Educational Resources. Paris, France: OECD Publishing. 2007. http://www.oecd.org/dataoecd/35/7/38654317.pdf [retrieved 5 January 2011]

About the Author

Mohammad Issack SANTALLY is from the Virtual Centre for Innovative Learning Technologies at the University of Mauritius.

Email: m.santally@uom.ac.mu