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## *Editorial*

### *Thanksgiving*

**Terry Anderson**  
Editor, IRRODL

In Canada we recently celebrated Thanksgiving Day, which reminds us of the many blessings in our individual and collective lives. I'm also reflecting with a thankful heart on those in our distance and open education community who have contributed to this and previous issues of this journal, and to scholarship in general, and who have freely shared their work with everyone. I also want to thank each of the reviewers and the associate editors who have donated their time and expertise to insuring the quality of the works published in IRRODL. Each article published in IRRODL has been improved by the critical review and suggestions for improvement made by these experts. I am also grateful to each of you for reading and subscribing to IRRODL. I trust that you will expand this blessing by passing on links and printouts of the work in this issue and perhaps even by writing a note of thanks to any of the authors. I am sure they will be thankful to know that their work is making an impact in our global network.

We are pleased to present another extensive issue of IRRODL that features eight research articles and three book reviews. In this editorial, I briefly review the contents of the issue with a hope that you are induced to read, bookmark, recommend, and forward links and RSS feeds to your colleagues and to your networks.

The first research article by William Sugar, Abbie Brown, and Kenneth Luterbach is entitled "[Examining the Anatomy of a Screencast: Uncovering Common Elements and Instructional Strategies](#)." I believe that this article is the first published that attempts to understand the structure and both implicit and explicit instructional designs of user-generated screencasts. Screencasts are a low-cost way to provide annotated descriptions of relevant content, and, in the process, to convey high levels of teacher presence through the rich human voices of teachers or designers. These features make screencasting a powerful and very cost-effective tool for online distance educators.

The second article "[Development of Interactive and Reflective Learning among Malaysian Online Distant Learners: An ESL Instructor's Experience](#)," by Puvaneswary Murugaiah and Siew Ming Thang is a qualitative analysis of a new distance education English language program delivered in Malaysia. English language is likely the most common course of instruction in the

world, and this study does an excellent job of analyzing the instruction and interactions through the lens of Gilly Salmon's five-stage model of e-learning competence.

[“A Review of Trends in Distance Education Scholarship at Research Universities in North America, 1998-2007”](#) by Randall S. Davies, Scott L. Howell, and Jo Ann Petrie continues a recent trend in the distance education journals to examine the scholarship of our discipline as presented in peer-reviewed distance education journals. The results of their review reflect my own experiences editing IRRODL for the past seven years. We have published much good research, but likely our collective work presents an overreliance on the relatively easy methodology of case studies and perception survey research. I trust this review, as well as those published recently in other distance education journals, will help us develop more extensive and rigorous research designs.

The fourth article by Michael E. Ward, Gary Peters, and Kyna Shelley is entitled [“Student and Faculty Perceptions of the Quality of Online Learning Experiences.”](#) This study uses student perceptions of a number of features of distance education delivery in both synchronous and asynchronous modes. Despite hundreds of studies showing comparable educational outcomes from distance and on-campus education there remains a lingering and usually overrated doubt as to the quality of distance learning experiences. This study demonstrates that student perceptions of distance delivery are not unfavorable when compared to on-campus delivery, thus providing additional evidence of not only the quality but of the acceptance of distance education formats.

[“Teaching and Learning Social Justice through Online Service-Learning Courses”](#) by Kathy L. Guthrie and Holly McCracken is a qualitative study that examines the development of values and ethical positions by distance education students. Too often distance education is perceived by the uninformed as only useful for teaching and learning of facts and conceptual ideas. However, a quality education also addresses the development of personal meaning and value systems. This article does an excellent job of demonstrating how this is done at a distance.

The next research article in this issue, [“The Pedagogical Enhancement of Open Education: An Examination of Problem-Based Learning”](#) is by Seth Gurell, Yu-Chun Kuo, and Andrew Walker. The article focuses on the use of open educational resources and most importantly discusses their use in problem-based learning activities. Problem-based learning has a long history of effective use in constructivist-based learning designs in face-to-face contexts. Bringing both open resources and problem-based pedagogies to online models of distance education addresses both the need for efficiency (reuse of open materials) and effectiveness (use of proven and engaging pedagogical activities).

Ining Tracy Chao, Tami Saj, and Doug Hamilton contribute an important article entitled [“Using Collaborative Course Development to Achieve Online Course Quality Standards.”](#) Quality course design is critical for effective learning, and this article from Royal Roads University illustrates a cost-effective way to produce and revise hundreds of courses annually while maintaining effective input and ownership from both subject matter experts and instructional and media experts.

The final research article, "[Online Instructional Effort Measured through the Lens of Teaching Presence in the Community of Inquiry Framework: A Re-examination of Measures and Approach](#)" by Peter Shea, Suzanne Hayes, and Jason Vickers uses the now familiar (though not uncontroversial) COI model to examine teaching presence. The article uses empirical data to expand the study of teaching presence beyond the participation of the instructor in online conferencing, which was the genesis of the COI model when it was developed over ten years ago. This study and its recommendations for future research will likely continue to evolve the COI model to be more comprehensive and thus of increased value to both teachers and researchers.





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## ***Examining the Anatomy of a Screencast: Uncovering Common Elements and Instructional Strategies***

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### **Abstract**

The researchers engaged in cooperative inquiry in order to explore screencasts as online instructional tools. In total, each researcher analyzed 37 screencasts, which provided over two hours of instruction. The content area of these screencasts concentrated on teaching specific computing procedures (e.g., how to install web server software or how to add a table in a word processor). The researchers analyzed their own self-produced screencasts as well as those that were professionally produced. Analyses of the screencasts led the researchers to discover common structural components (i.e., bumpers, screen movement, and narration) and common instructional strategies (i.e., provide overview, describe procedure, present concept, focus attention, and elaborate content). By synthesizing the common structure and common instructional strategies, the researchers offer a framework for considering the role of screencasts as online instructional tools. To introduce a practical application of the framework, the researchers created a screencasting checklist, which may be used by online instructors and instructional designers to develop and assess their own screencasts. This initial work invites additional research and development in order to refine the screencasting framework and checklist.

**Keywords:** Screencasting; screencasts; instructional media production; online learning; instructional strategies; online tutorials

Instructional Design and Technology faculty who teach online courses face continual challenges in effectively disseminating information to students about instructional media production (e.g., creating a motion tween in Flash) and other relevant skills (e.g., how to install an Apache web server). In face-to-face courses, PowerPoint presentations (including question-and-answer periods), demonstrations in computer lab sessions, and similar instructional activities are used to present this information. However, these face-to-face instructional strategies do not effectively translate to asynchronous online learning environments. To address the instructional gap created by the loss of face-to-face interactions, we are examining the use of screencasting as a means of improving our online course instruction. As we faced the challenge of providing online, asynchronous instruction in our Instructional Design and Technology programs, we asked ourselves the following question: Can screencasting improve instruction in our online courses?

## **What is a Screencast?**

Coined by Udell (2005), screencasting is a way to present “digitally recorded playback of computer screen output which often contains audio narration” and to visually demonstrate procedural information to students (e.g., inserting an image into an InDesign file). Also, the term *screencast* has been called “streaming desktop video captures,” “online tutorials,” and “screen captures” (Betty, 2008). In a screencast, the instructor records all of the necessary mouse clicks and corresponding screen activity to complete a designated task. The captured video can be accompanied with audio to create a multimedia presentation that clearly explains the actions (e.g., a series of mouse clicks), thoughts, and supporting details of the instructor (Peterson, 2007). One of the primary features of an instructional screencast is the direct capture of screen activity and images continuously. Audio can also be recorded simultaneously with the screen images.

While we are using screencasts with Instructional Design and Technology students, educators in other disciplines are also using screencasting for instructional purposes. Instructional screencasts and online video tutorials have been developed to teach a wide variety of topics, including object-oriented programming (Lee, Pradhan, & Dalgarno, 2008), undergraduate student research (Jenkins-Brown, 2008), assistive technologies (Van Laarhoven et al., 2008), mathematical modeling (Ellington & Hardin, 2008), nursing (Phillips & Billings, 2007), and the Dewey Decimal Classification System (Peterson, 2007). The aim of these screencasts and video tutorials is to teach learners about a topic and to demonstrate specific actions associated with the particular content area.

## **Instructional Benefits and Advantages of Screencasting**

There are definite benefits and advantages in using a screencast for instructional purposes. In their respective learning environments (e.g., home, office, coffee shop, etc.), learners can view a particular screencast at their own convenience and multiple times, if desired. By using a screencast, learners can see how to complete a particular procedure (e.g., how to insert a table in a word-processing file) and can observe what the actual screen looks like in completing the specific operation (Peterson, 2007). The inclusion of video-based instruction in online environments, such as screencasting, can have positive effects on student learning and can be pedagogically

equivalent to their face-to-face instruction counterparts (Pang, 2009; Traphagan, Kucsera, & Kishi, 2010). Hartsell and Yuen (2006) observed that online video-based instruction “brings courses alive by allowing online learners to use their visual and auditory senses to learn complex concepts and difficult procedures” (p. 31).

The combination of sound and images within a screencast enhances online learners’ experiences compared to the more traditional text format and can be a powerful method of communicating content in an online setting. Mayer’s (2001) theory of multimedia learning suggests that animated presentations that have a corresponding audio component, essentially moving picture and sound, provide a more effective learning experience than a more traditional alternative (e.g., a series of still pictures accompanied by descriptive text). This is in keeping with Paivio’s (1986) dual coding theory, which posits that information processed through discrete input channels, one linguistically based channel and one non-linguistically based channel, has an additive effect that improves the learning experience.

In addition to presenting multiple media formats to learners, screencasts also model particular behaviors and operations. Theoretically, screencasting should have a positive effect on learning because it provides multiple input channels by presenting an expert performing and describing a task. Wouters, Paas, and van Merriënboer (2008) observed that the instructional methods of modeling and vicarious learning, in which experts perform problem-solving tasks for learners while explaining their actions, are a good fit with teaching task performance (specifically tasks that must be approached heuristically, something a bit more complex than following a simple algorithm) and complex cognitive skill mastery. Screencasting technology fits well with this instructional approach in that it presents digital video of the expert’s actions for the learner to see while simultaneously presenting the expert’s audio commentary on his/her actions. Conversely, Wouters et al. advise care in designing presentations that show performance of a complex task with visualizations and verbal explanations because there is danger of overloading the limited cognitive capacity of the learner. Wouters et al. cite the limitations explained by cognitive load theory (Sweller’s [1988] theory, “that treats schemas, or combinations of elements, as the cognitive structures that make up an individual’s knowledge base” [Soloman, n.d.]).

## **Purpose of the Study**

While considering the current advantages and benefits of screencasting, the purpose of this study is to engage in disciplined inquiry in order to critically analyze the effects of instructional screencasts. Initially, we speculated that screencasting is a seemingly effective instructional method for our respective online instructional settings. Each of us (faculty member A, faculty member B, and faculty member C) received high teaching effectiveness scores (over 6.5 on a 7-point scale) for our courses that included screencasts. Furthermore, our students have informally given us positive comments on the use of screencasts for instruction. However, we were unsure about the essential instructional and non-instructional components (e.g., strategies, methods) of an instructional screencast. The questions we are striving to answer through formal investigation are

- What common instructional strategies are used in screencasts?
- How can we best understand the key components of an instructional screencast?

Engaging in this disciplined inquiry, we critically analyzed instructional screencasts and their role in online instruction. With this data, we expect to improve our own screencast production as well as to describe current practices for online instructors who are developing their own screencasts.

## **Research Method**

We employed the cooperative inquiry approach (Heron, 1996; Reason & Riley, 2008) in exploring the instructional components of our own screencasts and patterns of use that may be generalizable to other screencast development. The four stages of the cooperative inquiry approach may be summarized as

- Stage 1 – first reflection: During this stage, a group of researchers decides on the topics and methods of inquiry;
- Stage 2 – first action: During this stage, a group of researchers takes action based upon their first reflection and documents the outcomes of this action/inquiry;
- Stage 3 – second action: At this stage, a group of researchers may experience a new awareness and insight into the research topic;
- Stage 4 – second reflection: At this stage, a group of researchers reflect on their experiences, examine their findings, and refine their ideas for further research.

This interaction between the *reflection* and *action* stages continues until specific findings are established that respond to the initial research questions. All three authors were active research participants in this reflection/action process. In our collaboration, we made specific research decisions by consensus and each shared the results of our individual analysis of each screencast. This process enabled us to discover and articulate common elements of an instructional screencast.

## **Independent Analyses of Screencasts**

We conducted two phases of reflection and action screencast analysis: examination of our own screencasts and examination of professionally produced screencasts. The content area of these screencasts concentrated on teaching specific computing procedures (e.g., how to install web server software or how to add a table in a word processor).



## **Analysis of our own screencasts.**

With the goal of identifying common structural elements and corresponding instructional strategies and methods, we examined 12 screencasts that we produced ourselves (approximately 62 minutes of total presentation time). These screencasts were developed for our own respective online courses. Each of these courses was delivered via our respective university's Blackboard site. Table 1 provides a brief description of each course.

Table 1

### *Courses and Course Goals*

Faculty member	Course	Course goal
Faculty member A	Authoring Computer-based Instruction	The overall goal of this graduate-level course is to give students hands-on experience with specific computer-based instruction authoring tools (mainly Flash and Dreamweaver) and working knowledge of computer-based instruction methodologies.
Faculty member A	Multimedia Instructional Product Development	The overall goal of this graduate-level course is to give advanced instructional design students working knowledge and hands-on experience with the process of completing an actual multimedia instructional design project.
Faculty member B	Introductory Instructional Design	The overall goal of this graduate-level course is to introduce the concept of systematic instructional design. Course participants study the processes of instructional design.
Faculty member B	Visual Design for Educational Media	The overall goal of this graduate-level course is to add to students' visual design skills in order to create better print-based, computer-based, and projected instructional media.
Faculty member B	Web-Based Instructional Media	The overall goal of this graduate-level course is to give instructional design students a working knowledge of Web-based media production. Students produce podcasts, digital video, and HTML files, and they study the uses of online virtual reality and social networking.
Faculty member C	Introductory Instructional Design	The overall goal of this graduate-level course is to introduce the concept of systematic instructional design. Course participants study the processes of instructional design.
Faculty	Advanced Instructional	One fundamental goal of this graduate-level

member C	Design	course is to gain expertise in systematic instructional design processes. The second key goal is to challenge traditional notions of instructional design. Students design, develop, implement, evaluate, and refine instruction.
Faculty member C	Introduction to Performance Technology	The overall goal of this graduate-level course is to introduce fundamental issues in Performance Technology. Students may develop an electronic performance support system or engage in an authentic performance improvement project.

Table 2 provides a description of each screencast and the corresponding instructional goal. The screencasts covered five topics: adding hyperlinks using Flash Actionscript 3, adding frame labels to a Flash file, performing basic Dreamweaver and InDesign operations, manipulating images using Photoshop and Paint, transferring files to a web server, and installing PHP and Apache server software.

Table 2

*Screencasts and Instructional Goals*

Faculty member	Screencast	Instructional goal	Screencast duration
Faculty member A	Flash Components	How to incorporate common components within a Flash CS3 file	6:11
Faculty member A	Frame Label	How to insert a frame label within a Flash CS3 file	11:50
Faculty member A	Adding a Link - Basic	Basic strategies on how to insert a link within a Flash CS3 file	12:01
Faculty member A	Adding a Link - Advanced	Advanced strategies on how to insert a link within a Flash CS3 file	5:30
Faculty member B	Dreamweaver Basics Part 1	How to create and save an HTML file. How to add and format text to an HTML file	5:48
Faculty member B	Dreamweaver Basics Part 2	How to add graphics to HTML files	6:04
Faculty member B	Image Size and Resolution	How to use Photoshop to change an image's size and resolution	4:27

Faculty member B	InDesign Basics	How to navigate InDesign	3:18
Faculty Member C	Image Editing	How to resize an image in Paint	1:03
Faculty Member C	Apache Web Server Installation	How to install the apache web server	2:42
Faculty Member C	PHP Installation	How to install PHP	4:51
Faculty Member C	Electronic File Transfer	How to transfer files to a web server	0:43

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We evaluated two screencasts from each faculty member for a total of six screencasts per iteration. We conducted this analysis twice, with the goal of refining our observations through a combination of repeated observation and discussion. At the end of each iteration, we reflected upon each screencast's structure, and we identified common components found among the six screencasts. As we watched each screencast independently, we made notes on its structure and the instructional methods used. We maintained a list of these components in an online Google Documents file for which each of us had author rights. At the end of each iteration, we refined our framework of screencast structural elements (see Figure 1).

### **Analysis of professionally produced screencasts.**

After completing the first analysis phase of examining screencasts that we produced, we conducted a similar analysis of professionally produced screencasts. The professionally produced screencasts covered the following topics: creating a podcast using GarageBand, adding a table in a word processor (i.e., Pages), and writing conditional statements using Flash ActionScript 3. We purposefully selected these screencasts based on their task complexity; each was an activity similar to one we would assign in our courses (e.g., creating a podcast, adding a table to a word-processing document, writing conditional statements in ActionScript). Table 3 provides the topic and/or title, producer, and duration of each screencast. Our intention was to look beyond our own collection of self-produced screencasts in order to see whether the overall structure and common format components were generalizable to the larger pool of publicly available screencasts. As with our previous analysis, our overall goal was to decipher the format and corresponding instructional strategies employed in each screencast.

Table 3

*Professionally Produced Screencasts*

Screencast topic/title	Producer	Screencast duration
<hr/>		
Podcasting using GarageBand		
Creating a Podcast	Apple.com	2:25
Setting up the Metronome	Atomic Learning	1:42
Using the Count in Feature	Atomic Learning	1:15
Punching in a Fake	Atomic Learning	2:18
Recording Multi-Take Performances	Atomic Learning	4:03
Recording with Multiple Tracks	Atomic Learning	1:20
Podcasting with GarageBand 3	Lynda.com	14:27
Inserting a Table using Pages		
Adding Tables and Charts	Apple.com	~2:00 (no length indicated)
Creating a Table	Atomic Learning	0:39
Selecting Cell Borders	Atomic Learning	0:41
Modifying Cell Borders	Atomic Learning	0:34
Creating Table Headers	Atomic Learning	0:42
About Tables	Lynda.com	2:37
Inserting Tables	Lynda.com	5:48
Creating Conditional Statements with Flash ActionScript 3		
Creating a Conditional Statement Pt. 1	Atomic Learning	2:34
Creating a Conditional Statement Pt. 2	Atomic Learning	3:28
Creating a Conditional Statement Pt. 3	Atomic Learning	2:07

Screenecast topic/title	Producer	Screenecast duration
Conditions: Thinking Script	Lynda.com	7:38
Understanding Conditional Statements	Lynda.com	1:36
Writing a Conditional Statement	Lynda.com	4:40
Understanding Conditional Operators	Lynda.com	1:37
Understanding Conditional Operators	Lynda.com	4:49

During this phase, we evaluated 25 screencasts in three iterations. The total amount of time for these screencasts was approximately 67 minutes. For each iteration, we concentrated on one particular task and software application. During the first iteration, we evaluated seven screencasts using GarageBand; during the second iteration, we evaluated seven screencasts using Pages; and during the third iteration, we evaluated eight screencasts using Flash Actionscript 3. At the end of each iteration, we again reflected upon the structure of each screencast and identified key common components; we also made notes similar to those in our previous analysis and modified our list of these elements and components in our online document.

### **Construction of a Screencasting Framework and Corresponding Instructional Strategies**

After analyzing 37 screencasts (total length of approximately two hours) within five iterations in the two aforementioned analysis phases, we exhausted our list of common elements of a screencast. At the end of our last iteration, we did not identify additional information related to our analysis. As a result, we constructed a framework that describes common screencast elements (see Figure 1).

The framework contains two categories: structural elements and instructional strategies. There are three common structural elements: bumpers, screen movement, and narration. There are five instructional strategies: provide overview, describe procedure, present concept, elaborate content, and focus attention. The following subsections define and elaborate upon each category.

## **Structural Elements**

Structural elements are those that describe the format of a screencast in terms of sectioning, screen recording, and general narrative elements.

### **Bumpers.**

We observed that screencasts may begin and/or end with a *bumper*. We borrow the bumper term from radio broadcasts. It refers to a statement of identity at the beginning and/or end of a broadcast. Some screencasts include an initial greeting or bumper (e.g., “Hi, this is your instructor from the Multimedia Production class.”) and also have a corresponding ending or bumper (e.g., “This is your instructor from the Multimedia Production class saying goodbye.”).

### **Screen movement.**

We also observed a difference between *static* and *dynamic* movement within screencasts. Some of the examined screencasts followed the cursor. In these screencasts the capture frame moves around the screen, keeping the cursor in the center. In our framework, we refer to this style as *dynamic screencast movement*. In contrast, other screencasts maintain a constant frame in which the cursor moves within that frame, which we refer to as *static screencast movement*. Static screencast movement seems to be the default for the majority of screencasts. Dynamic screencast movement seems to occur most often in screencasts developed for advanced users. We hypothesize that designers may feel the need to keep the screen static for beginners because they do not have a well-developed schema for the screen. In contrast, advanced users have an overall mental model of the entire screen and can concentrate on portions of the screen.

### **Narration.**

Some screencasts’ audio commentary is an *explicit description* of a procedure that coincides with what is displayed on the screen. An example of explicit narration is “click on Edit then click on Select All.” During the narration, the learner sees the mouse clicking on the Edit menu and then the mouse clicking on the Select All option. Other audio commentary is an *implicit description* of a procedure. For example, a screencast includes the following narration: “create a new file.” The learner observes the mouse cursor clicking on the File menu and then selecting the New option. A majority of the examined screencasts included a combination of both of these narration formats.

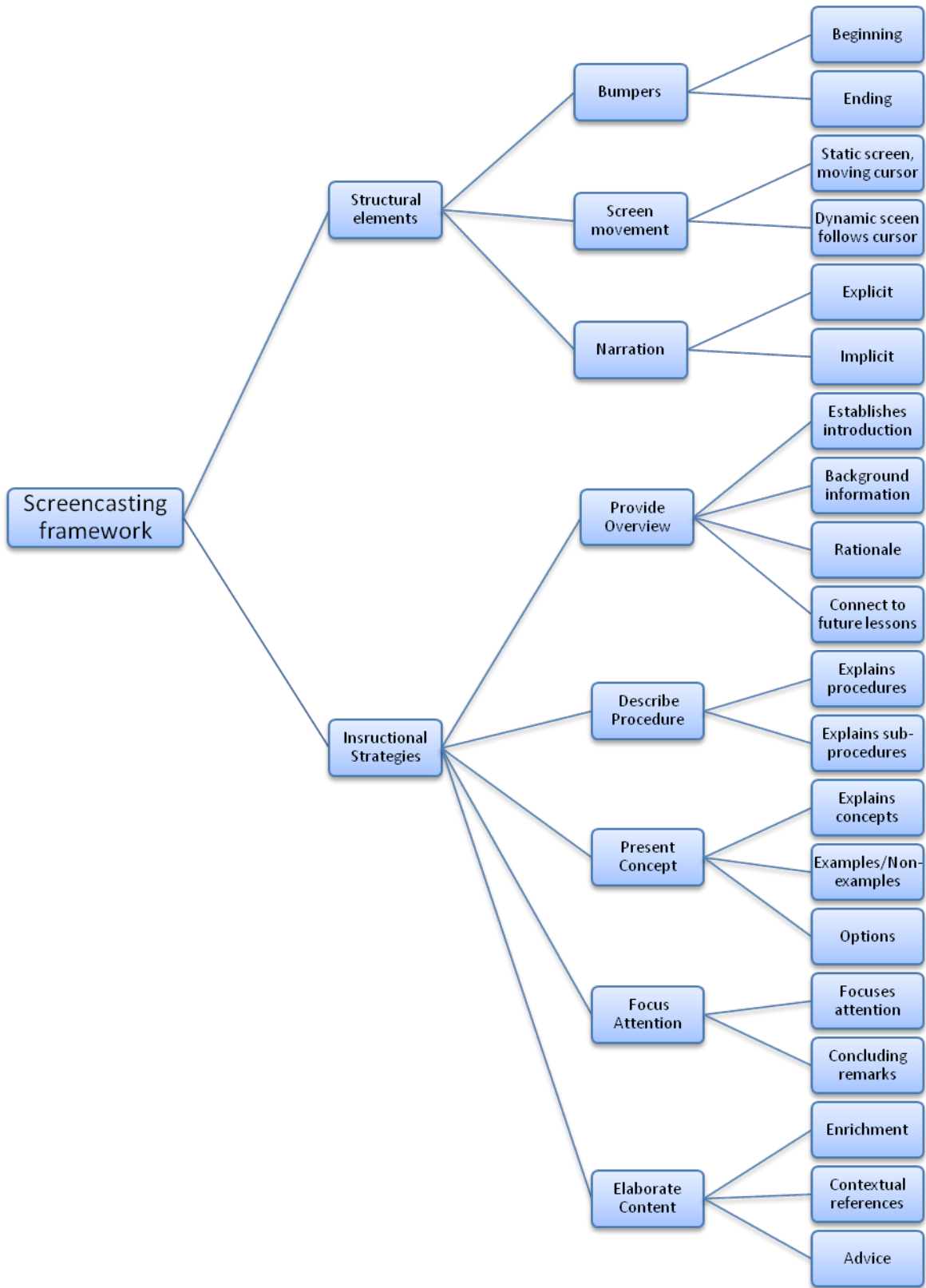


Figure 1. Screencasting framework and corresponding instructional strategies.

## **Instructional Strategies**

Five instructional strategies were commonly used in the screencasts evaluated: provide overview, describe procedure, present concept, focus attention, and elaborate content. Although the examined screencasts did not contain instances of every instructional strategy, no screencast contained any other instructional strategy.

### **Provide overview.**

A common set of instructional strategies concentrated on providing an overview of a particular topic by introducing the topic, giving a rationale for studying the topic, and connecting the lesson topic to future lessons. One goal of this type of strategy is to *establish set* (a term borrowed from classroom teaching) or to provide an introduction to the particular topic area. Overview strategies provide the necessary background information that learners need in order to understand the context and/or the purpose of the screencasting topic; for example, in the Image Editing screencast, faculty member C talks about why one would want to resize an image using MS Paint. Sometimes, this overview strategy gave screencast learners the rationale for completing a task or operation; for example, in the Apache Web Server installation screencast, faculty member C talks about why one would install an Apache web server, and in the About Tables screencast, the instructor describes why and how one would use tables in a word-processing file.

A similar instructional strategy occurred at the conclusion of a particular screencast. During this conclusion, an instructor commented on important elements with regard to the particular topic area. These remarks focused learners on key aspects of the screencast. In the About Tables screencast, the instructor informed the learners about the upcoming Tables screencasts and how this information would be connected. In the Image Size and Resolution screencast, faculty member B summarized what the learners learned in the particular screencast and commented that they had changed the image size and resolution in the particular screencast. Highlighting key elements enabled learners to concentrate on essential steps within a screencast.

### **Describe procedure.**

The focus on providing procedural knowledge is evident in screencasts. There is a direct correspondence with Udell's (2005) screencasting definition (i.e., "digitally recorded playback of computer screen output which often contains audio narration") and the demonstration of routines and tasks. Most of the screencasts examined during our investigation demonstrated a procedure and thus included this instructional strategy. We also found that an individual screencast sometimes included one or more sub-procedures. For example, in the Adding a Frame Label screencast, faculty member A demonstrated the procedure for copying and pasting a menu button within Flash in order to demonstrate how to create a frame label. In the screencast Dreamweaver Basics Part 2, faculty member B demonstrated multiple page-modification procedures, including how to insert an image into an HTML page and how to change the background color.



## **Present concept.**

In addition to imparting procedural knowledge within screencasts, we found that several screencasts offered an explanation of a specific concept related to the screencast topic (e.g., differences between a JPEG file and a PNG file, object-oriented programming, the PHP programming language). To explain a concept, some of the screencasts used a common *example/non-example* instructional strategy to demonstrate similarities and differences. In the Adding a Link – Basic screencast, faculty member A demonstrated what happens if one does not select the correct shape when creating a link within a Flash module. A similar instructional strategy to illustrate a concept was to describe options available in completing a procedure. For instance, in the Recording Multi-Take Performances screencast, the instructor informs learners that one can use cycle recording as a suitable alternative. Or in the Creating a Table screencast, learners are told that one can change the look of a table by changing its shading and opacity. This combination of describing a concept related to the procedure along with demonstrating the procedure itself appeared to be an effective instructional strategy.

## **Focus attention.**

Attention focusing is another common instructional strategy employed. The narration and/or cursor location direct learners' attention to a particular component on the screen or to a certain part of an overall procedure. For example, in the InDesign Basics screencast, after demonstrating selecting an image in an InDesign file, faculty member B's narration informs learners that they can observe information about a selected item; attention is focused on the selection by demonstrating selecting an item and using the cursor to circle the selection's information. In the Adding a Link – Basics screencast, faculty member A directed learners' attention to the stroke color icon and informed them that there needs to be a red line in this icon in order to create an invisible button.

## **Elaborate content.**

In our analyses, we found that screencasting instructors elaborated beyond the topic with regard to a particular procedure, concept, or other aspect of the screencast. This instructional strategy facilitates opportunities to enrich learners' understanding and to encourage learners to consider other aspects of the process or concept associated with the screencast's subject-matter. By providing these additional details, the instructor makes contextual references to similar instructional settings that are relevant to the screencast content. For example, both faculty member A and faculty member B describe prior coursework and assignments in relation to the particular activity in their respective Adding a Link – Advanced, and Dreamweaver Basics Part 2 screencasts.

Another example of an elaboration strategy involves the instructor offering advice about how best to use a particular tool or technique described in the screencast. In the Writing a Conditional Statement screencast, the instructor recommends that learners be consistent in writing

Actionscript 3 code because the code for an action may be written in a variety of ways. In the Image Size and Resolution screencast, faculty member B explains to learners how to locate a web-friendly image prior to inserting the image into a Dreamweaver file. This elaboration instructional strategy enhances the screencast and further strengthens learners' overall comprehension of the topic.

## **Discussion**

There is no doubt that screencasts are becoming important instructional tools for online learning environments. Our study provides information on the structure and instructional strategies currently in use for screencasts, and it provides a framework for evaluating screencast instructional content. See the Appendix for a checklist that is based upon the screencasting framework in use in this evaluation process. We encourage this evaluation process both to determine the instructional effectiveness of a finished screencast and to serve as a pre-production checklist for screencasting.

This framework and corresponding checklist address one of our primary research questions. That is, how can we understand the key components of a screencast? Though this framework and corresponding checklist is without question a result of our initial inquiry, we anticipate continuing research that will lead to improvements. Establishing this starting place is a vital step in comprehending screencasts as instructional tools.

It should be noted that screencasting as an instructional strategy may be viewed as a modern descendent of instructional film and video. The research and recommendations borne out of endeavors such as the visual instruction movement of the 1920s, the Office of Education Training Films in the 1940s, the Instructional Film Research Program in the 1950s, and the Denver-Stanford Project of the 1960s, to name but a few, may be applied to instructional screencasting, particularly in terms of identifying key structural components. See Saettler (1990) for a more complete history and discussion of the impact of visual instruction and educational film and video.

Prior to this study, we operated under the assumption that screencasts were a compilation of procedures only. We realize now that this is not true. By identifying numerous instructional strategies besides the familiar description of a procedure, we recognize the need to consider how the full spectrum of instructional strategies (e.g., elaboration, attention focusing, concept attainment) can be employed in screencasting. Understanding the surprisingly complex nature of screencasts enables producers to make best use of a variety of instructional strategies and provides schema for consumers that help them to understand fully screencasting's instructional potential and the value of specific screencasts.

It also appears that faculty members have unique screencasting teaching styles. After examining a couple of screencasts by one individual, we could anticipate how a screencast by that individual would be structured and developed prior to observing it.

## **Recommendations for Further Research**

More research on the connection between one's overall teaching philosophy, overall online course development, and screencast development should take place. This could lend insight into the overall development of screencasts and their effect on online course delivery.

Similarly, future research on how screencast learners' responses to individual screencasts relate to their respective mental models is needed. Observing learners' reactions to screencasts that make use of different instructional strategies would lend additional insight. In a future thinkaloud protocol study, these learners can offer additional information on the best ways to create effective screencasts and also possibly provide additional effective instructional strategies.

In the future, we hope to see more research addressing questions regarding specific and effective instructional strategies for each of the areas of our framework: for example, what elaboration instructional strategies are best used in screencasting or what are the best techniques for teaching conceptual knowledge in a screencast? Similarly, because there is a strong connection between video-based screencasts and educational television, a re-examination of educational television research conducted from the 1970s through the 1990s should take place. Revisiting this literature would help identify and study the effect of these broadcast variables (e.g., bumpers) within current screencasts. This would likely provide valuable information for instructional designers and screencast producers.

## **Limitations**

While we were able to examine a number of screencasts from a variety of producers, ranging from our self-produced efforts to those that were professionally produced, we recognize that this sample by no means represents the full population of screencasts produced and made available to either the general public or students in specific courses. Additionally, we did not evaluate screencasts that recorded face-to-face instruction. Therefore it is possible that we were unable to observe additional structural elements or instructional strategies that may have been employed by those producers whose efforts are not included in this study. Our framework and checklist is comprehensive for the screencasts we observed but may need updating to include more structural elements and instructional strategies.

Furthermore, while three observers helped control reliability of examination, we recognize the possibility that other observers may identify the use of structural elements and instructional strategies that we overlooked.

## **Conclusion**

We hope the findings from our current investigation will help screencast developers and online instructors become more aware of the structure of screencasts and of specific instructional strategies employed in screencasting. Our framework and checklist provide a reference for both evaluation and production. We encourage screencast development that makes informed choices regarding the overall structure and the instructional strategies employed in screencasting.

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## Appendix

### Screencast Observation Checklist

File Name	
Producer	
Observer & Date	
Duration	

Structural elements	Comments
<input type="checkbox"/> Beginning Bumper	
<input type="checkbox"/> Ending Bumper	
<input type="checkbox"/> Screencast movement (Static or Dynamic)	
<input type="checkbox"/> Narration (Explicit or Implicit)	

Instructional Strategies Employed	Comments
<p><i>Overview</i></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Establishes Set (Introduction)</li> <li><input type="checkbox"/> Provides Background Information</li> <li><input type="checkbox"/> Provides Rationale</li> <li><input type="checkbox"/> Future Lessons</li> </ul>	
<p><i>Procedural knowledge</i></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Explains Procedure</li> <li><input type="checkbox"/> Explains Sub Procedure(s)</li> </ul>	
<p><i>Conceptual knowledge</i></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Explains Concepts</li> <li><input type="checkbox"/> Provides Examples/Non-Examples</li> <li><input type="checkbox"/> Explains Options</li> </ul>	
<p><i>Attention focusing</i></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Focuses Attention</li> <li><input type="checkbox"/> Provides Concluding Remarks</li> </ul>	
<p><i>Elaboration</i></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Provides Enrichment</li> <li><input type="checkbox"/> Makes Contextual References</li> <li><input type="checkbox"/> Offers Advice</li> </ul>	







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## ***Development of Interactive and Reflective Learning among Malaysian Online Distant Learners: An ESL Instructor's Experience***

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### **Abstract**

Technology has brought tremendous advancements in online education, spurring transformations in online pedagogical practices. Online learning in the past was passive, using the traditional teacher-centred approach. However, with the tools available today, it can be active, collaborative, and meaningful. A well-developed task can impel learners to observe, to reflect, to strategize, and to plan their own learning. This paper describes an English as a Second Language (ESL) instructor's attempt to foster interactive and reflective learning among distance learners at a public university in Malaysia, working within the framework proposed by Salmon (2004). The authors found that proper planning and close monitoring of a writing activity that incorporates interactive and reflective learning helped to raise the students' awareness of their own learning process and consequently helped them to be more responsible for their learning. The students acquired significant cognitive benefits and also valuable practical learning skills through the online discussions. However, there were challenges in carrying out the writing task to promote this form of learning, including students' professional and family commitments and cultural attitudes as well as communication barriers in the online environment. To overcome these challenges, the authors recommend the following: ensure tutor guidance, enforce compulsory participation, address technical problems quickly, commence strategic training prior to the beginning of a task, and implement team teaching with each instructor taking on certain roles.

**Keywords:** Reflective learning; online learning; distance education; English Proficiency course

Developments in educational technology have played a pivotal role in changing the dynamics of online education, namely distance education. Computer-mediated communication tools, both synchronous and asynchronous, allow learners to participate in interactive activities with their peers in a virtual environment. These tools are becoming so interactive and collaborative that they provide opportunities for instructors to achieve diverse pedagogic goals (Squires, 1999). For instance, Salmon (2002) successfully developed, moderated, and explored reflect-on-practice activities with an asynchronous text-conferencing system, while Lazarowitz and Natan (2002) combined computer-mediated communication (CMC) with cooperative learning to promote the power of a cooperative learning environment. The role of collaborative and interactive tools is crucial in online distance learning (ODL) as distant learners are separated geographically and even temporally from their peers and instructors and therefore are required to learn independently. This poses a major problem for them as they have to be disciplined and motivated to learn on their own. When students are unfamiliar with university education and distance learning, social interaction is as important as cognitive content for learning achievement (Kear, 2001). Social and emotional interactions are important as encouragement and acknowledgement are essential for motivation and learning (Rovai, 2001; Rourke et al., 2001).

Engaging in peer interaction activities involves student-instructor interaction, peer-to-peer collaboration, and active learning (Chen, Gonyea, & Kuh, 2008). These activities can assist students, namely ODL students, to collaborate and develop important skills in critical thinking, self-reflection, and co-construction of knowledge. Such learning environments can contribute to better learning outcomes, including development of higher-order thinking skills. A well-structured online unit offers essential support and development for learners to build their expertise in learning online (Salmon, 2002). Furthermore, with the advent of interactive tools, online learning can be more learner-centered if planned well and utilized fully. In a learner-centered online activity, students are expected to be responsible for constructing their own knowledge while engaging in the learning process. This includes reflecting upon their actions and thoughts and monitoring their own learning processes and knowledge construction (Garrison, 2009; Jonassen, 1999). Such activities happen on an individual basis but also through peer interaction. The instructor has a major role to play in assuring the success of this form of learning. She has to design activities that not only engage the students productively but are able to motivate and move them towards self-directedness. This paper explores to what extent an online writing task can achieve the above goals; as well, it explores the challenges faced by the instructor in the developmental process.

## **Background to the Study**

The School of Distance Education (SDE), Universiti Sains Malaysia (USM) caters to adults from around the country. Their ages range from 23 to 72 years. A majority of these adults have scant knowledge about the mechanics of distance learning, namely the learning and delivery methods. The course delivery modes at SDE include printed materials, videoconferencing, electronic portal, and streaming Internet video. Learning via the Web is a novel feature for many, including those who are computer savvy.

A large number of distance-learning students at SDE, sometimes as many as 1,000, register for the basic English Language Proficiency course (as indicated in the SDE student records). This is due to the fact that English proficiency courses are compulsory for all students and low-proficiency students have to start with the basic course; whereas, students of higher proficiency begin with a higher-level course. The low-proficiency students view their attempts to improve language skills as an uphill task, and this problem is aggravated because they are learning on their own through a distance-learning system. Each proficiency level is handled by only one English language instructor. Hence, it is not surprising that the task of giving advice and guidance to these students is monumental. The instructor not only has to provide ample opportunities for them to practice the various language skills, but also needs to motivate them and help them to be more self-directed. The main author and researcher of this paper has been an English language instructor at SDE for 7 years. [From this point onwards, the main researcher will be referred to as the instructor.] Over the years, she has tried various ways to support her students effectively. These included using the Web to present activities, downloading exercises and language quizzes, using getting-to-know activities, presenting writing tasks, and providing feedback. However, she soon realized that her efforts were futile as improvement in her students' language proficiency was minimal. They remained teacher-dependent, expecting her to spoon-feed them. Her involvement in the e-educator project led her to realize that a probable reason for this was that social and practical content was not prominent in the methods she employed. Her focus was primarily on cognitive content, that is, acquisition of basic language skills, which was insufficient to achieve her desired goals. As Kear (2001) points out, interactions with social and practical content are important for distance learners, who are coping with both university and distance education. In another study, Birch and Volkov (2007) found that ESL students who are shy to speak in English are willing to participate in online discussions. Thus, it is evident that for online learning to benefit ESL students, it must incorporate social interaction, collaboration, and reflection.

The e-educator module was a research project funded by the Higher Education Funding Council for England (HEFCE) and managed by the School of Education, University of Nottingham. The piloting of the e-educator module involved providing support for one year to a group of six online USM tutors (including the main researcher) who were teaching online distance learning courses in various disciplines. These tutors received online training modules that promoted interactive and reflective practices and were required to reflect on the pedagogical and affective issues presented in various units of the training modules. They also interacted with each other and their mentors in online discussion forums, blogs, and e-mails. Regular face-to-face meetings to troubleshoot and discuss problems reinforced this training. For more information on the e-educator module and the pilot project, please refer to Joyes, Hall, and Thang (2008), Thang and Joyes (2009), and Thang and Murugaiah (2009). The project website is available at [www.echinauk.org](http://www.echinauk.org).

Involvement in the e-educator project caused the instructor to realize the need to focus on the process of helping her students become more independent and reflective learners. In other words, her focus should be on *how* something is learnt, rather than on *what* is learnt (Clouder, 2000). Siemens (2005) concurs. According to him, learning in the digital age occurs through the process

of interaction with various sources of knowledge and participation in group tasks. Reflection plays a significant role in this process. Brindley, Walti, and Blaschke (2009) share the same view. They affirm that knowledge construction occurs through interactions involving peer sharing. For higher levels of learning, reflection is key (Kanuka, Collet, & Caswell, 2002). Thus, it appears that interactive and reflective practices (the process of learning) contribute to knowledge construction (the product of learning). However, the instructor was rather apprehensive of the impact of such a practice on her students. Could her students adapt to the idea of learning online without face-to-face interaction? Lin (2008) points out that in adult learners, a gap exists between their old thinking and the new knowledge they encounter. In making adjustments to reduce this gap, they may feel disconnected at some points in their learning, which can lead to disruptions in peer collaboration (Brindley et al., 2009). Furthermore, the instructor was concerned whether her students would really learn with and from their peers through online interaction. Kim, Liu, and Bonk (2005) warn that communication difficulties, like slow feedback and unfamiliarity with group members, can hinder online peer-group learning. The issue of cultural influences on learning also needs to be considered. The objective of this study was therefore to seek answers to these questions in relation to teaching English writing skills to basic-level students, using an interactive and reflective approach.

## **Models of Interactive and Reflective Approaches**

Social constructivist theory underpins this study; it postulates that knowledge is constructed in a social environment when individuals reflect on their own and other people's ideas (Maor, 2003). In other words, an individual's understanding or knowing does not develop in isolation but through interactions with other people. Collaboration in a social learning environment is a vital element in any learning experience (Adams, 2006). An online learning environment is no exception. Online courses based on constructivist principles must be relevant, interactive, project-based, and collaborative, giving learners a certain degree of control over their learning (Partlow & Gibbs, 2003). The instructor becomes a facilitator, helping students to construct their own knowledge. Technology-enhanced teaching, from a constructivist viewpoint, should therefore bring about more student-oriented teaching, group work, and learning.

Salmon's (2004) scaffolding model, teaching and learning through online networking, adopts constructivist theory. This model promotes online networking and group work while allowing the scaffolding of individual development. The two building blocks in the model are essential in promoting student interaction and learning:

1. The teacher is an e-moderator who initiates and moderates discussions to promote student learning;
2. Educational online activities (e-tivities, as defined by Salmon, 2002) develop students' abilities to collaborate online, so they can construct new knowledge via discussions.

This model was particularly useful for the online task designed by the instructor as it stresses the personal character of learning. It emphasizes that the learner is central in an online activity and that online learning is a social process. The model also demonstrates that both interaction and

reflection are key in online learning. Thus, it is important to engage students in learning from one another through online interaction and reflection.

Salmon (2004) distinguishes five stages of online learning that an instructor should bear in mind when structuring and organizing an online activity (shown in Figure 1).

Stage 1 – access and motivation: As new online learners may experience apprehension and frustration in accessing an online interactive site, it is the role of the e-moderator to motivate and encourage them to learn online while ensuring that access to the online network is easily available.

Stage 2 – socialization: It is vital for an e-moderator to create an environment for online learners to share and exchange ideas by facilitating online work and cooperation.

Stage 3 – information exchange: At this stage, online learners interact with course content and other people involved in the online network (including the e-moderator). The e-moderator assigns tasks and requires learners to explore all relevant information available to them.

Stage 4 – knowledge construction: At this stage, learners hold online discussions regarding a task(s). These interactions can promote knowledge construction. In maintaining the online group, the e-moderator interacts with the learners and encourages them to contribute to the discussion.

Stage 5 – development: Online learners at this stage must become critical and self-reflective, as well as responsible for their own learning. They must be able to build on ideas acquired through online activities and apply them to their individual contexts.

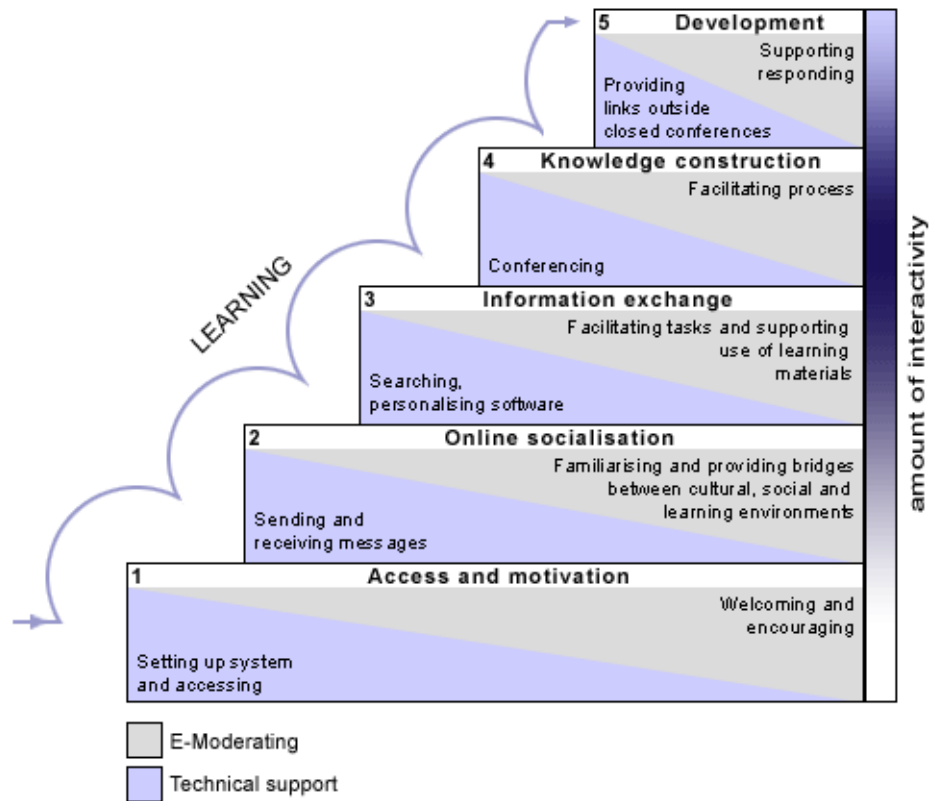


Figure 1. Model of teaching and learning online. From *E-Moderating: The Key to Teaching and Learning Online* (2nd ed., p. 29) by Gilly Salmon (2004), New York and London: Routledge. Reprinted with permission.

## Methodology

The purpose of the study is to determine the extent to which an online writing task can result in interactive and reflective learning among distant learners at SDE. To accomplish this, action research is employed. Action research, which is a form of self-reflective inquiry to improve one's own practice (Carr & Kemmis, 1986), involves solving problems and making changes or improvements. The basic principles underlying action research are to identify an issue or problem, to find a possible solution, to try it out, to evaluate it, and eventually to change the practice. Two processes are significant in action research: the actions that lead to learning and the learning that results from reflecting on one's own actions. Self-reflection is crucial in examining one's own work. It involves applying knowledge acquired from one's experiences to improve practice (Ferraro, 2000). Action research, therefore, is learning in and through action and reflection (McNiff & Whitehead, 2002).

This study uses Salmon's (2004) model of teaching and learning through online networking. To implement the 5-stage model, the instructor designed a guided writing task for her English Proficiency Level 1 students who had obtained Band 1 or 2 in the Malaysian University English Test. They were between 23 and 70 years of age, mainly from rural areas, and with varied

professional backgrounds. As the task involved online collaboration and reflection, they used the e-learning portal provided by SDE as their learning platform. The portal, which was easily accessible by both students and instructors, provided salient tools for interaction, such as Wiki and discussion forums. For the online writing task, the discussion forum was used. The postings in the discussion forum regarding the task were analyzed qualitatively to examine the extent to which the task fostered interactive and reflective practice among students. The next section describes the online networking, reflection, and learning that occurred as the task progressed, based on the stages postulated by Salmon.

## **Implementation of the Stages and Outcomes**

In implementing Salmon's model (2004), the instructor took several measures to ensure that each stage was carried out effectively. The progress of the online task through the various stages could be discerned by students' interactions and reflections in their postings. In this paper, initials identify the postings by the instructor (Ms. P) and the students.

### **Stage 1 – Access and Motivation**

This is the induction stage for online learning. As learning online was a novelty for many of the students involved, it was important to try to prepare them emotionally and mentally for the task ahead. To do this, the instructor tried to create a friendly and relaxed environment by introducing herself in the following manner:

Ms. P: Hi everyone, I'm Ms. P.M., your English teacher. Call me, Ms. P for short. We will be communicating a lot through this discussion forum. I will post many activities and exercises here for you to participate and try. The forum has been created for you. So feel free to introduce yourself, get to know others, post any query you have, etc. Since we seldom meet face-to-face, this is another convenient and effective way to communicate. You can interact with your peers as well as with me. So let us make it fun!

Technical and operational issues can hinder a student's enthusiasm in participating online. Problems with operating the portal and accessing the online system needed to be addressed effectively to prevent students from becoming disinterested in online activities. As a result, the instructor encouraged her students to contact her via e-mail or telephone regarding any technical problems they encountered. She also provided them with the technician's contact details for direct consultation. Moreover, she endeavored to respond quickly and efficiently to their queries to create a close rapport with them. This was rewarded with comments such as those below:

Z: Thank you, Ms. P and Mr. N. [the technician]. I now can read all the postings. I am excited. Now I can make many friends.



R: Ms. P, I nearly gave up with the portal...luckily Mr. N. helped me with the problem. I am happy I can contact you and my friends.

B: Ms. P, thank you. I am not good with computers, so I thought I surely cannot use the portal. With your help, I can use it...not only for English but also other courses.

Motivation is an important factor for the success of a student. As distance learners with a generally low level of English proficiency, their self-esteem and motivation levels were also low. It was apparent that throughout the five stages, they had to be motivated to access the online system and also to spend enough time and effort on the task posted to make them active online.

Ms. P: To realize that you are weak is the first step towards improving yourself. As you can see, many of you are weak in English...so you're not alone. Let us work together to try to improve our English, OK?

Ms. P: So, many of you are from rural areas. But that does not mean you cannot improve your English. You know, I'm from Perlis...and I grew up and attended school in a rural area too. I was not good in English when I was young, but I started reading English story books and slowly I improved. So you can improve too. It's never too late!

Creating such an environment would motivate them to try to improve their English.

## **Stage 2 – Online Socialization**

Creating an online environment that was conducive to interactions among students was vital. So prior to the task, it was important for the instructor to ascertain that learners were beginning to interact with their peers and to establish online identities. She used the discussion forum for this purpose, encouraging students to experiment with this mode of socializing. Some introduced themselves to the community and shared personal details, problems, and other information.

R: Hi! My name is R. I am from Jitra, Kedah. Are any of you from Jitra? I am scared whether can pass English or not...so if got students from here, we can do group work.

N: I am N from Pasir Mas, Kelantan. My English is also very weak. Never use it at home or work. Last time, when in school, just repeated what teacher said, that's all. I don't know how I can now improve my English...so old already!



A: My name is A from Masai, Johor. How to improve English together when all of us are weak? It is like we say in Malay, 'five multiplied by two is the same as two multiplied by five.'  
[all in the same boat]

The purpose of socialization was to foster closer bonds and create a sense of comradeship among the learners. The introduction task met with success. Even those who were very weak in the language posted their introductions. There was a sense of togetherness as they felt that, like the others, they were also weak in the language. They consoled one another and some boosted their self-confidence by providing encouragement for their peers to take action on their weakness.

B: Don't think you are alone. We from Kelantan are weak in English. That's a fact. What to do? But many from the West coast, their English is OK.

I: You're not the only one, B. Many of us are weak too. I think it's no point we just talk about poor English. Like Ms. P said, let's try to do something about it. She said she'll help us. So why not we try?

Z: For me, able to write a few sentences in English is good already...I think I'm improving. Why not we all think like that? One step at a time.

### **Stage 3 – Information Exchange**

At this stage, students interacted not only with each other but also with the content. The instructor requested that students read the notes about writing expository essays in their module (each student was given the course module at the start of the academic year). She also gave an online summary of the notes to reinforce their understanding. During this stage, the instructor introduced the task. However, to make her students aware of the importance of reflections and collaboration, she modeled reflective thinking and her expectations in the discussion forum prior to giving them the task.

Ms. P: Many of you use the discussion forum to know your friends, read my notes, etc. Now I want you to go one step further. When you do this writing task, I want you to recall the steps you had taken to do it. For example, after you write a short paragraph, trace the steps you had taken when writing that paragraph. This is called reflecting where we become aware of our own learning process. Write down your reflections in the forum. For example, I write:

'There are many causes of air pollution. One factor that contributes to it is the emission of toxic fumes by factories. The

factories do not filter the wastes before disposing them. Due to this, toxic fumes that contain ammonia, sulphur and other chemicals are released into the atmosphere. The health of residents who live nearby the factories is affected.'

After writing the paragraph, I try to recall my writing process. For example: 'Like in the notes, I must first have a main idea and then supporting ideas. Then, I must make sure the tense used is the present tense because the topic is factual.' This is called reflection. Do you have a clear idea of what reflection is now? If you are not clear, don't worry. Let me know, I will help you. OK, I will give you one week to ask me about reflection. After that, I will give you the first task.

The implementation of the task was planned carefully. The instructor developed the task to suit her students. She provided clear guidelines and instructions to ensure that the task would flow smoothly. She also explained the aims of the task, her expectations, and their roles.

Ms. P: This is what I want you to do. I will give you a topic and you are required to write a short paragraph on it. Next, reflect on how you wrote the topic and jot down your reflections. Others would also post their reflections. Then reflect on and respond to your friends' reflections. Don't worry about your peers' reaction to your reflections. By sharing your reflections, you can learn from one another. You can share a strategy that you used with another student and vice-versa. Reflect each time you write and share your reflections with your peers. You will certainly be in control of your own learning. Good luck!

In the following week, she posted the topic, "what success means to you," and requested a short paragraph on it (shown in Figure 2). Students were instructed to reflect on their writing process – how they wrote that paragraph, retracing their thought processes – and post these in the forum. After that, they had to read and respond to the reflections of others. Two weeks were allocated for this. Then another topic was posted and the students were required to repeat the same processes as before. Over a period of three months, five topics were given. The other topics within this writing task were "steps to improve the standard of English among distant learners," "the role of the Internet in education," "factors that contribute to an increase in crime rate in the country," and "is money good or evil?"

It must be noted that this task was not a compulsory component of the course. Nevertheless, the instructor encouraged all to contribute to the task. During the three months the task was conducted, 27 students contributed fully to it, and their postings formed the data of this research. Others submitted the postings required but did not post their reflections. There were some who tried a few of the topics given to them, but their postings were not included in the data obtained for this study.

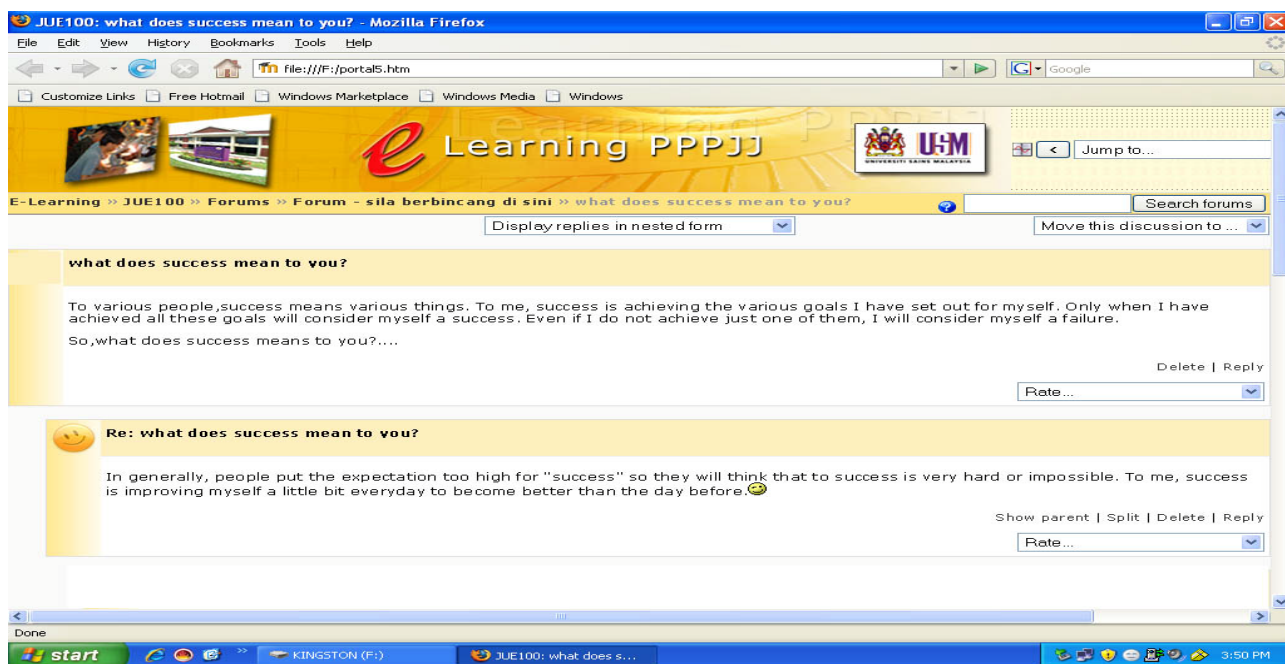


Figure 2. Samples of student postings.

## Stage 4 – Knowledge Construction

In this stage, the instructor monitored to what extent knowledge construction took place and endeavored to support students in their attempts to reflect on their own writing processes, share them with their peers, and comment on the reflections of their peers. This was a demanding task, but she adhered steadfastly to the following principles: (1) the instructor is accountable for maximizing student interaction (Hawkes, 2006); (2) the instructor must monitor and facilitate interactions as well as actively participate in the exchange of knowledge and reflections (Beldarrain, 2006); and (3) the extent to which students find value in their online learning experience and are satisfied with the results rests on the quality of those interactions (Dooley et al., 2003).

In the initial stage, the instructor observed that some students' personal reflections were rather limited.

A: I wrote what came to my mind.

N: I followed the paragraph writing guidelines that Teacher (Ms. P) gave.

T: I just remember how to develop a paragraph and use tenses.

Some displayed apprehension at having to reflect on their peers' reflections.

M: My English is poor so I have nothing to comment.

K: I myself am weak in English...how to reflect on other reflections?

C: Sorry, how to comment when I don't know whether my comment is right or not?

She then realized the need to support them further by giving guidance on how to reflect (both individually and in a group). Hence, she posted some questions that would prompt them on how to reflect.

Ms. P: What came to your mind? Go deeper and recall each step.

Ms. P: What are the guidelines that you followed? How did they help you in your writing?

Ms. P: Do you think your responses to your peers' reflections would help them in their writing?

They were also encouraged to be constructive and not emotional in responding to their peers.

Ms. P: We are all here to learn. It does not matter whether your English proficiency level is lower than your peers' or vice versa. Ali's English is probably better than yours but your comment may help him to improve further in his writing. So think of how your response will benefit your peer. It does not matter how much your peer gains from your response. What is more important is the fact that you reflect on their personal reflections and present a constructive response that can assist him/her in his/her learning.

Due to the intervention and more practice sessions, students' reflections and feedback improved noticeably.

B: I did an outline of the topic, and then I wrote. Then I checked for coherence, and correct vocabulary. I think this way is good.  
[student reflection]

K: First I wrote the main idea and then thought of how to develop it. I checked to see whether my points support the main idea. [student reflection]

R: Don't write in Malay and then translate. Think in English. It is difficult at first, but you can improve your English this way. [student's comment on a peer's reflection]

F: Always check whether there is a main idea and supporting sentences. Sometimes our sentences don't support the main idea, for example we give a wrong example for the main idea. [student's comment on a peer's reflection]

## **Stage 5 – Development**

In this stage, learners are able to reflect on their own learning process to achieve the desired goals. An analysis of the students' discussion revealed that as the activity progressed students were applying some of the suggestions offered by their peers in their reflections.

A: I don't do an outline before I write. But after R's suggestion, I tried. I find it is easier to write.

T: Thank you, Z...you are right. I now think of main idea and supporting ideas as the roof and pillars of a house...it's easy to understand.

D: I also like football, so I thought why not, like M, I read the sports section in the Star [newspaper] to learn new words. I read what I like and at the same time improve my vocabulary.

## **Reflection on the Instructor's Roles in the Writing Activity**

The online writing activity, featuring reflections and collaboration, attempted to assist students in self-directed learning and in improving their English-language writing skills. As this was a student-centered activity, the instructor took on the role of a facilitator. However, she soon found herself providing pedagogical knowledge, managing the learning context, acting as counselor and advisor, and handling technical problems. This experience is in tandem with Maor's (2003) claim that online instructors play four roles: pedagogical, social, managerial, and technical.

During the online task, the instructor found the pedagogical role most demanding. She was aware that her students had limited knowledge and skills as far as reflections were concerned. Even their collaborative skills were lacking. Hence, she had to figure out ways to address these problems. Despite some improvements, in the end she had to admit that her students' contributions lacked depth. Thus, it would appear that a sound knowledge of learning strategies

is vital. Strategy training may have to be given before attempting to instill reflective thinking skills.

The instructor also found that the managerial role was not easy. It involved planning the task from beginning to end. She had to ensure that the task was appropriate for the students' level of proficiency, learning environment, and social background. The versatility and capacity of the learning platform also had to be taken into consideration. Monitoring and evaluating the task proved to be even more challenging. She also had to closely monitor and evaluate the students' contributions and interactions so that they did not deviate from the aims of the task. Aside from these concerns, students' interest and pace in performing the task had to be monitored and maintained. This included intervening at appropriate times to encourage them to continue and to be more reflective in their contributions.

Maintaining positive affective conditions was also a vital role of the instructor. Thus, the instructor had to don the social hat and find ways to boost learners' self-esteem, to motivate them, and to provide a supportive learning environment.

Last but not least, technical problems had to be attended to. Fortunately, the instructor could forward major problems to the technical staff support person. Her role was mainly limited to solving navigational problems faced by those who were unfamiliar with the e-learning portal.

## **Presentation and Discussion of Findings**

From the findings, it would appear that interactive and reflective practice can be carried out online. Over three months, the online task fostered this practice to a certain extent. Students' initial apprehension of the task and their role was slowly replaced by improved participation and contribution to the discussion. A congenial and relaxing atmosphere put students at ease with their peers and instructor.

K: I was shy at first because my English is poor. But when I read the reflections made by my friends, I realized that all of us are weak in English. So we can learn together. I relaxed. I enjoyed reading my friends' comments. Some were so funny.

D: Ms. P, I got an idea...you become a student and we become the instructor...because we are now experts in reflection!

Students' sharing also revealed that their drive to learn was enhanced, probably because learning from peers is less formidable than from teachers. There is comradeship among students; they can relate to one another in a relaxed manner (Wei & Chen, 2006). As a consequence, in the current study the students were more at ease with their friends, appeared more motivated, and also believed that they could assist their friends. This result was evident in the study.

W: Don't worry...our gang here is ready to help you, S. Just say what you don't know...main idea? Coherence?...we can teach you. Right, Ms. P?

The postings reveal that student interactions among peers and their reflections benefitted them, especially in learning English. They managed to learn, unlearn, and/or relearn new knowledge. As proposed by Tsai (2004), these students, through learning to learn, have learned not only to restructure their knowledge and to make meaningful links with other forms of knowledge and experiences, but also to monitor and review their own learning. Peer interactions can help them to have better control of their learning, which leads to self-directed learning.

S: I feel I am learning to write all over again. This time I am doing the learning with some help from others. I like that.

B: I think I learn better by discussing with my friends. Learning on my own is boring.

H: Learning to write like this is fun because it is learning in a group. You enjoy but at the same time you learn to write in English.

The findings also demonstrate the challenges faced by the instructor in carrying out the task. The instructor had to monitor the task and ensure that students' interest was maintained. It is not easy for adult learners to accept and adapt to new technology and ways of thinking, as pointed out by Lin (2008) and Brindley et al. (2009). This problem was evident in the initial stages when some students expressed their reluctance to participate in the activity.

J: I'm not good with computer at all. My children help me to access the portal because I cannot. So I don't want to take part.

K1: I don't know anything about computer or portal or e-learning. Difficult for me.

Furthermore, due to their various professional and family commitments, some of the students viewed the task as time-consuming, and this affected their motivation to participate actively in the task. Thang et al. (2010) found that these factors were constantly used by Malaysian Smart School teachers to explain why they could not participate more actively in given online tasks. Ostlund (2008) attests to the negative impact of adult responsibilities on distance learning. As distance learners, they have to juggle study time with work and family.

Z: I take a long time to do this writing because I'm weak. I sometimes am fed up because I can only do after my work and my children are sleeping...I get tired.



Additionally, in a few instances interactions were affected by the reluctance of some students to comment on their peers' reflections because they felt that doing so would be disrespectful.

L: I like to read other comments but I don't like to comment.  
How to give comment when I am not good in English...like  
show off only!

M: So funny...as if I so good, I tell my friends what I think of  
their comment. Sorry la ...I am commenting because must  
comment. May be my comment not good...

Thang et al. (2010) also found evidence of this cultural attitude in a project with Malaysian Smart School teachers who were reluctant to post too much because they were afraid that their comments would be disrespectful to their peers or that they would come across as "showing off."

Another challenge faced is the communication barrier brought about by the absence of face-to-face communication. Rheingold (1993) points out that, "the authenticity of human relationships is always in question in cyberspace, because of the masking and distancing of the medium, in a way that it is not in question in real life." (p. 129). Boyd (2007) and Kim et al. (2005) support this observation. The Malaysian context revealed a similar finding. Thang et al., in a study of online participation by a group of Malaysian Smart School teachers, found that the teachers were reluctant to participate online and attributed this to the fear of facing an unknown audience in the virtual world.

## **Implications, Suggestions for Improvement, and Conclusion**

The present study has several implications for ODL practice and research in Malaysia. Overall, the online interactive and reflective writing activity seems to have managed to raise the students' awareness of their own learning. Those who actively participated in the given task appeared to have learnt to reflect and managed to apply it in improving their writing skills in English. They also found that peer reflections and evaluation had motivated and helped them to write better. Thus, they had not only acquired significant cognitive benefits, but also valuable practical learning skills through the online discussions. Maor and Volet (2007) emphasize that online discussions can contribute to improved learning skills as well as to the quality of learning. The interactive and reflective approach has also promoted new knowledge construction and meaningful learning among online learners, a finding similar to that of Celentin (2007).

A tutor's guidance is crucial for the success of interactive and reflective learning. His or her intervention can address student problems with technology, with team members, and with content. The findings reveal that the instructor's guidance reduced such problems and that, to a certain extent, successful learning was achieved. It is evident that distance education students in the study benefitted from this form of learning.



However, the study also identified some challenges. Lack of participation due to professional and family commitments, cultural factors, and communication barriers cannot be easily resolved as they will need not only careful thought and planning but also changes in mindset and policies (including government and school policies). Nevertheless, it is possible to undertake certain measures to minimize the problems and to ensure greater success in future attempts. One way is to enforce compulsory participation as recommended by Birch and Volkov (2007). Technical problems also need to be addressed quickly to enable smooth online interactions among students. A comfortable and reliable technological environment facilitates group online interactions (Koh & Hill, 2009; Thang et al., 2010). Moreover, strategy training should be provided prior to the commencement of a task (Brodie, 2007), which helps to reduce student anxiety about the task as well as to ensure its smooth implementation. Factors such as age, group size, culture, and appropriate technological tools should be given due consideration when determining the task (Koh & Hill, 2009). Last but not least, team teaching should be implemented with each instructor taking on certain role(s). This form of learning is too demanding for one instructor (as shown in this study), especially if she or he is handling a large group of students.

Finally, the researchers would like to acknowledge that the preliminary nature and short duration of this study do not permit generalizations and would like to propose further research on a larger scale to establish to what extent these findings are applicable in a wider context.

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## ***A Review of Trends in Distance Education Scholarship at Research Universities in North America, 1998-2007***

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### **Abstract**

This article explores and summarizes trends in research and scholarship over the last decade (i.e., 1998-2007) for students completing dissertations and theses in the area of distance education. The topics addressed, research designs utilized, and data collection and analysis methods used were compiled and analyzed. Results from this study indicate that most of the distance education research conducted by graduate students in this period of time has been descriptive, often addressing the perceptions, concerns, and satisfaction levels of various stakeholders with a particular distance education experience. Studies of this type typically used self-report surveys and analyzed the data using descriptive statistics. Validating the concern of many distance education scholars, there was a lack of graduate student research aimed at developing a theory base in distance education. On a positive note, projects directly comparing distance education with traditional face-to-face classrooms to determine the merit of specific programs declined significantly in 2007 as compared to 1998. This result might indicate that distance learning is becoming accepted as a viable and important educational experience in its own right. Another encouraging finding was the decreased emphasis on studies focused on technology issues, such as those analyzing the quality of distance education technology and questioning educators' ability to provide an acceptable technology-enabled distance learning experience.

**Keywords:** Distance education; graduate student research; research utilization

When considering the general state of distance education research, an important starting point is to examine what is published in scholarly journals and to conduct a review of theses and doctoral dissertations (Moore & Kearsley, 2005). Several articles over the past decade have chronicled the research trends of studies published in major distance education journals (e.g., Berge & Mrozowski, 2001; Lee, Driscoll, & Nelson, 2004; Ritzhaupt, Stewart, Smith, & Barron, 2010; Zawacki-Richter, Baecker, & Vogt, 2009). This article explores and summarizes trends in research and scholarship over the period of 1998-2007 for students completing dissertations and theses in the field of distance education. More specifically, the topics addressed, research designs utilized, and data collection and analysis methods used were compiled and analyzed.

## **General State of Distance Education Research**

There is little doubt that distance education is an innovative and expanding field (Allen & Seaman, 2007). In 1995 only one-third of the institutes of higher education in the United States offered distance education courses (Lewis, Snow, & Farris, 1999). The most recent national study (2006-07) on distance education sponsored by the Department of Education indicates that “two-thirds (66%) of 2-year and 4-year Title IV degree-granting postsecondary institutions reported offering online, hybrid/blended online, or other distance education courses” (Parsad & Lewis, 2008, p. 2). For a variety of reasons, distance education and online learning are appealing to students, teachers, and administrators in many fields. But even with this level of acceptance and use, many researchers acknowledge that unless the amount and quality of distance education research and scholarship are improved, substantial improvements in teaching and learning are unlikely (Lee, Driscoll, & Nelson, 2004; Moore & Kearsley, 2005).

Naidu (2005) observed that the majority of distance education research has been descriptive (i.e., studies that describe how or what is being done in a case study context) and kindly suggested that the rigor and quality of much of this research is suspect. While high-quality descriptive research has its place and contributes to the development of a working knowledge of important aspects of the field, some argue that distance education must develop new scientific models using more rigorous research methodologies (Tallent-Runnels et al., 2006).

Another common type of research used to study distance education programs and initiatives is evaluation research, which examines the effectiveness of distance education practices (Moore & Kearsley, 2005). Often, effectiveness evaluations are based on a comparison with traditional face-to-face classrooms (Gaytan, 2007; Tucker, 2001). The typical criteria for measuring the effectiveness of distance education instruction focus on analyses of student achievement in, attitude toward, and satisfaction with the learning experience (Phipps & Merisotis, 1999). Critics of this practice point out the poor methodological design of some of these comparison studies and the questionable quality of assessment instruments used to gather comparison data; they also suggest that studies simply comparing faculty and student perception of and satisfaction with distance learning and traditional models of face-to-face instruction are rather weak evidence of value (Beaudoin, 2004; Bernard, Abrami, Lou, & Borokhovski, 2004; Meyer, 2002; Tallent-Runnels et al., 2006). More fundamentally, while most studies show distance education to be as effective as traditional education (Meyer, 2004; Russell, 1999; Saba, 2000; Simonson, 2002;

Zhao, Lei, Yan, Lai, & Tan, 2005), the need to validate the importance and viability of distance education based on comparisons with face-to-face learning experiences seems to expose a deep-rooted insecurity within the distance learning community—a fear that distance education is regarded as a somewhat substandard and less valued educational practice. This phenomenon has prompted calls for more formative evaluation practices to address concerns regarding the need for (1) improving the distance education experience, (2) establishing acceptable principles of best practice, and (3) developing standards of quality by which distance education practices can be judged (Beaudoin, 2004; Garrison & Anderson, 2003; Meyer, 2004; Sherry, 2003).

Finally, while it should not be assumed that quality distance education research does not exist (Meyer, 2002), many distance education scholars express concern regarding the perceived emphasis on the pragmatic rather than the theoretical. They point out the apparent inadequacy of research aimed at establishing a solid theory base from which distance education can develop (Beaudoin, 2004; Garrison & Anderson, 2003; Saba, 2003; Moore & Kearsley, 2005). New scholars typically learn to conduct research in graduate school as they complete thesis and dissertation projects. For this reason, an analysis of research topics and methods in graduate schools promises to provide an important perspective and update on the state of research in the field.

## **Research Methods**

This study used content analysis techniques to determine trends in research topics or purposes, research designs, and types of data collection and analysis methods. A thematic analysis was employed to determine the most frequently addressed topics and most commonly used designs and methods in order to explore changes in these aspects of graduate student research in distance education for the period of 1998-2007.

## **Manuscript Selection Criteria and Process**

Moore and Kearsley (2005) point out the difficulty researchers have in accessing all the relevant graduate student research on the topic of distance education. Internet technologies make this task possible, but some studies are not labelled as distance education research per se, and many manuscripts have been submitted with abstracts only. For this study, abstracts alone were insufficient for the desired analysis; full-text manuscripts were needed. In addition, the time and effort involved in reading and categorizing a decade's worth of available research manuscripts presented a daunting task. This study sampled manuscripts at three points in the last decade (i.e., 1998, 2002, & 2007) to uncover any trends that may exist.

The sample used in this study includes all full-text English doctoral dissertations and master's theses located using the descriptor *distance education* submitted to the ProQuest Dissertation and Theses Database (PQDT) in 1998, 2002, and 2007. PQDT (formally known as UMI) is a commercial database housing a searchable archive of published dissertations and theses (see [proquest.com](http://proquest.com)). This database provided a suitable pool of graduate student research from North America from which we could study this issue. A representative from ProQuest disclosed to the



authors that PQDT receives 97.2% of all dissertations and theses from research universities in the United States (276 of 284) and 87.2% (41 of 47) of those from Canadian research universities (personal correspondence, May 17, 2010).

A keyword search using the general search criteria for the phrase *distance education* was performed. The thesaurus for the Education Resources Information Center (ERIC), sponsored by the United States Department of Education, added *distance education* to its controlled vocabulary on October 24, 1983. No similar phrases or terms related to distance education were included in the search criteria for manuscripts; however, the following related terms are referenced to distance education as part of the ERIC thesaurus: asynchronous communication, blended learning, computer-mediated communication, continuing education, correspondence schools, educational radio, educational television, electronic learning, extension education, external degree programs, geographic isolation; handheld devices, home study, independent study, laptop computers, lifelong learning, mass instruction, nontraditional education, online courses, open universities, outreach programs, part-time students, synchronous communication, telecommunications, telecourses, virtual classrooms, virtual universities, and web-based instruction (see [www.eric.ed.gov](http://www.eric.ed.gov)).

In 1990, ERIC had 1,260 academic submissions associated with the controlled vocabulary *distance education*. By 1995 the number of citations in this category had increased to 2,709, and by the time of this writing, the number had increased to just under 12,000.

## **Manuscript Coding**

Each manuscript selected for analysis was read and coded by two of the seven graduate students who participated in the manuscript coding process. All raters, who were paid by the hour, were trained in the coding process, and random quality checks were performed to ensure a satisfactory level of coding, with training updates provided as needed. Each manuscript was categorized on the general topics addressed in the study, the research designs utilized, and the data collection and analysis methods used. Initial inter-rater reliability was determined; however, all discrepancies in ratings were arbitrated by an independent third rater to establish a definitive final count in each area. Many individual manuscripts addressed more than one topic or utilized multiple data collection and analysis methods. All principal topics addressed and methods used in each study were included in the count. Results of the classifications for each of the four areas were compared across years.

## **Classification of Coding Categories**

Categories for coding were determined using an a priori approach. Topic categories largely follow those identified in a similar study conducted by Lindsay, Wright, and Howell (2004). Table 1 provides a summary of the topic categories with a description of category contents. Quantitative research designs were identified from research texts; however, qualitative research designs do not share the same degree of specificity and therefore were generally classified as qualitative survey research (i.e., surveys with open-ended questions), ethnographic studies, or

narrative phenomenological studies (see Table 2). Data analysis techniques were identified from research texts; however, since qualitative analysis methods were only generally described by student researchers, they are categorized together. Qualitative analysis usually included segmenting (organizing) data from open-ended surveys, interviews, and observations then describing patterns found in the responses or observations.

Table 1

*Research Topic Descriptions*

<b>Topic</b>	<b>Description</b>
Student issues	Issues students face or perceptions they express concerning distance education
Faculty issues	Issues faculty/instructors face or perceptions they express concerning distance education
Pedagogical issues	Teaching and learning issues involved with distance education
Instructional design	Issues involving the design of instruction for distance education
Methods testing	Test of a distance education method, including comparisons of the achievement, attitudes, or satisfaction levels of those involved
Instructional methods description	Description of a specific implementation or the current status of a distance education program
Distance education theory	Research involving DE theory or theory-based conceptual framework of distance education
Economic issues	Research looking primarily at the economics of distance education
Governance/administration issues	Studies concerned primarily with policy issues and administration of DE programs
Technology issues	Technology issues related to distance education
Scalability	Possibility or feasibility of scaling distance education to larger audiences
Historical foundations	Historical perspectives and foundations of distance education
International perspectives/transferability	Context of international venues and transfer of distance education to different audiences

Table 2

*Research Design Descriptions*

<b>Design</b>	<b>Description</b>
Random controlled trial	Comparison groups determined through randomization to explore causal effect relationship
Quasi-experimental	Comparison groups determined with non-random methods to explore causal effect relationship
Casual comparative	Comparison of groups that were pre-determined—could not be randomly assigned (also called ex post facto design)
Correlational	Process of determining the relationship or degree to which relationships exist between two or more variables in the study
Descriptive quantitative survey research	Surveys designed to understand/describe DE situation (predetermined variables, close-ended items)
Descriptive qualitative survey research	Surveys (open-ended items) designed to understand/describe DE situation (specific variables typically not predefined)
Ethnographic	Descriptive analysis of cultural patterns or perspectives for identifiable groups of people
Narrative phenomenology	Narrative of individual(s) experiencing a specific phenomenon or event
Case study	Account of a specific instance, generally descriptive
Other	e.g., literature reviews

## **Findings and Discussion**

Certainly this experience has demonstrated for the researchers the variability in the quality of current graduate student research. This study does not, however, attempt to judge the quality or appropriateness of the methods graduate students utilized to conduct distance education research. This analysis is primarily descriptive with the intention of understanding what topics graduate students studied and what methods were employed in their research.

## **Trends in Research Topics**

Table 3 presents the distribution of research topics addressed each year. Approximately 100 research papers were extracted for each of the years sampled in this study. The sample includes

all manuscripts fitting the selection criteria each year. The “percentage of total” columns in the table do not add to 100% as some of the studies addressed more than one topic. For example, some papers considered both student and faculty issues in the same study. The frequency counts provided represent how often specific purposes or general topics were addressed by graduate student researchers.

Table 3

*Research Topic Distribution by Year*

	2007		2002		1998	
	count	% of total	count	% of total	count	% of total
Student issues	32	29.4	21	21.0	17	17.2
Faculty issues	21	19.3	21	21.0	12	12.1
Pedagogical issues	9	8.3	14	14.0	13	13.1
Instructional design	10	9.2	7	7.0	12	12.1
Methods testing	18	16.5	21	21.0	17	17.2
Instructional methods description	8	7.3	10	10.0	14	14.1
Distance education theory	2	1.8	2	2.0	1	1.0
Economic issues	1	0.9	3	3.0	0	0.0
Governance/administration issues	7	6.4	11	11.0	9	9.1
Technology issues	3	2.8	6	6.0	17	17.2
Scalability	1	0.9	0	0.0	0	0.0
Historical foundations	0	0.0	3	3.0	5	5.1
International Perspectives/transferability	3	2.8	1	1.0	2	2.0
Other	1	0.9	1	1.0	0	0.0
Total documents	109		100		99	

Note: Initial inter-rater reliability 65% -- all discrepancies in ratings were arbitrated for the final count

### **Teacher, student, and administrative issues.**

Based on the research being conducted in this study, the data trends seem to suggest a fairly consistent research emphasis on student and faculty issues. These categories include topics that address the perceptions of stakeholders, i.e., their attitudes toward, satisfaction with, and thoughts regarding specific distance education experiences. Governance and administrative issues as research topics also fall into this general area of research. They typically follow a similar type of research design and, though less frequent, have been fairly consistent as topics of interest.

### **Methods testing.**

Research that tests methods falls into the category of evaluation research often labelled as *media comparisons* due to the tendency of researchers to compare distance and traditional instructional practices. Testing distance education methods has also been fairly consistent as a purpose of

many studies. Yet while the frequency of methods testing studies has remained fairly consistent, the trend has moved away from comparisons with face-to-face classroom experiences. In 1998, 12 of the 17 methods testing studies (71%) determined the effectiveness of the distance education initiative by a comparison with a traditional face-to-face learning experience; in 2007, this number dropped to 5 of the 18 studies (28%).

### **Instructional design and pedagogy.**

Studies that have considered the design and pedagogy involved in distance education learning situations have also been fairly common, although graduate students' interest in studying such topics seems to have declined slightly since 1998.

### **Technology issues.**

An interesting trend in research topics is the decrease in studies addressing technology. Apparently, concern for whether distance education technology would be reliable or advanced enough to facilitate the demands of distance education has diminished considerably. While technology issues were a large concern in 1998, with 17 studies addressing this issue, only 3 studies researched this topic in 2007.

### **Research no-shows.**

Several areas of research seem to be of less interest to graduate students. Distance education theory is the most notable in the list of infrequently studied topics or purposes, along with economic issues, scalability, historical foundations of distance education, and studies involving an international perspective. To be fair, many students cited distance education theory, or in some way tested theory, in their studies. Every study analyzed in this sample included a literature review of some sort. But in this sample, only a couple of graduate student studies each year *focused* their research directly on theory development or exploration.

### **Trends in Research Designs**

The frequency of various research designs utilized each year in graduate student research is reported in Table 4.

Table 4

*Research Design Distribution by Year*

	2007		2002		1998	
	count	% of total	count	% of total	count	% of total
Random controlled trial	8	7.3	3	3.0	0	0.0
Quasi experimental	11	10.1	11	11.0	8	8.1
Casual comparative	7	6.4	3	3.0	0	0.0
Correlational	9	8.3	2	2.0	5	5.1
Descriptive quantitative survey research	46	42.2	38	38.0	33	33.3
Descriptive qualitative survey research	8	7.3	5	5.0	1	1.0
Ethnographic	4	3.7	3	3.0	4	4.0
Narrative phenomenology	3	2.8	3	3.0	1	1.0
Case study	24	22.0	27	27.0	32	32.3
Other	1	0.9	8	8.0	16	16.2
Total documents	109		100		99	

Note: Initial inter-rater reliability 70% -- all discrepancies in ratings were arbitrated for the final count

As Naidu (2005) suggests, most student research seems to be descriptive. A pattern from the research studies analyzed in this sample indicates a strong and increasing reliance on survey research designs and case studies involving self-report evidence from stakeholders. The number of random controlled trials and casual comparative (i.e., ex post facto) designs increased, but consistently the method for establishing comparison groups was to select participants from existing groups or convenient samples (i.e., quasi-experimental designs). The number of studies using qualitative surveys has increased (i.e., predominantly surveys using open-ended items with no specific predetermined variables of interest), but the frequency with which qualitative designs have been employed remains fairly small and consistent.

### **Trends in Research Data Collection and Analysis**

Tables 5 and 6 present the various data collection techniques and data analysis methods used most often each year in graduate student research. Since the predominant research design used in this sample involved survey research, it is understandable that the most commonly used data collection method involved surveys. More than half of the studies utilized a survey of some type, including both self-report surveys and attitudinal scales. Student researchers tended to use interviews as a principal source of qualitative data, although many qualitative studies used a variety of data collection methods, including surveys or analyses of existing documents and artifacts.

Table 5

*Data Collection Methods Distribution by Year*

	2007		2002		1998	
	count	% of total	count	% of total	count	% of total
Standardized assessments	7	6.4	5	5.0	3	3.0
Researcher created assessments	8	7.3	5	5.0	3	3.0
Existing test scores	8	7.3	6	6.0	2	2.0
Quantitative survey instrument	57	52.3	57	57.0	50	50.5
Qualitative survey instrument	15	13.8	7	7.0	6	6.1
Observations	1	0.9	8	8.0	8	8.1
Interviews	39	35.8	41	41.0	38	38.4
Existing artifacts	11	10.1	24	24.0	24	24.2
Other - literature review of other research	0	0.0	1	1.0	9	9.1
<b>Total documents</b>	<b>109</b>		<b>100</b>		<b>99</b>	

Note: Initial inter-rater reliability 83% -- all discrepancies in ratings were arbitrated for the final count

Table 6

*Data Analysis Technique Distribution by Year*

	2007		2002		1998	
	count	% of total	count	% of total	count	% of total
t-test	22	20.2	18	18.0	9	9.1
Analysis of variance (ANOVA, ANCOVA)	19	17.4	18	18.0	15	15.2
Multiple regressions	7	6.4	3	3.0	1	1.0
Factor analysis	2	1.8	1	1.0	0	0.0
Linear regression	1	0.9	2	2.0	2	2.0
Correlations	14	12.8	9	9.0	12	12.1
Exclusively/primarily descriptive statistics	43	39.4	31	31.0	24	24.2
Non-parametric analysis (e.g., chi-squared)	13	11.9	6	6.0	7	7.1
Qualitative analysis	43	39.4	40	40.0	35	35.4
Other - personal interpretation	1	0.9	3	3.0	18	18.2
<b>Total documents</b>	<b>109</b>		<b>100</b>		<b>99</b>	

Note: Initial inter-rater reliability 78% -- all discrepancies in ratings were arbitrated for the final count

Most of the studies in this sample used some descriptive data analysis (e.g., frequencies & percentages). Studies identified specifically as using descriptive statistics were those that used this type of data analysis exclusively or predominantly. A large number of student researchers did use descriptive statistics as their main analysis tools.

In the studies from this sample, the qualitative data analysis methods were not described in specific detail; thus, qualitative data analysis methods were combined in the count for this study. Typical qualitative data analysis seems to have included segmenting or organizing data from open-ended surveys, interviews, and observations then describing patterns found in the responses or observations. Trends in the amount of qualitative data analysis being used seem proportionally similar to the number of qualitative data collection methods used.

Of interest in this data set is the frequent use of quantitative statistical analysis techniques involving t-tests and ANOVA analysis. The use of such data analysis techniques seems high, given the data collection methods employed. One observation from the coding of manuscripts that might help explain this apparent inconsistency is that students often used these types of analysis to make comparisons in survey results based on disaggregated groups of respondents. While the appropriateness of this practice with survey data is suspect, given the type of data that surveys produce and the assumptions regulating the use of these analysis techniques (Reynolds, Livingston, & Willson, 2006), this is what was reportedly done, and it may help explain the disproportionate frequencies.

## **Conclusions**

This analysis of dissertations and theses in the field of distance education provides a macro perspective that promises to inform future research and meta-analysis. One limitation of this study is that it does not include student research conducted outside of North America. Still, it is evident that during this past decade, while the number of dissertations and theses prepared in North America has remained fairly static, shifts in topics studied and research methods used have occurred.

Consistent with Naidu's (2005) observations regarding the types of research being conducted in the field of distance education at that time, this study found that over the past decade, most graduate level research has been descriptive. More often than not, graduate students' research has addressed the perceptions, concerns, and satisfaction levels of various stakeholders with a particular distance education experience. These types of studies usually administered self-report surveys and analyzed the data using descriptive statistics. While there is value in conducting quality descriptive research, a lack of research addressing other important topics is evident.

Validating the concern of distance education scholars regarding the lack of research intended to establish distance education theory (Beaudoin, 2004; Garrison & Anderson, 2003; Saba, 2003; Moore & Kearsley, 2005), this study found little graduate student research aimed at developing a theory base for distance education. Unfortunately, far too few studies explored new or challenged old theory. Factors that may help explain this finding include the challenges associated with conducting any type of grounded theory research. Many graduate students lack the experience, time, and resources needed to conduct this type of research. Additionally, they may be limited in their access to the participants and educational situations needed to rigorously explore and establish distance education theory. Unfortunately, the purpose for having graduate students conduct research is often to have them demonstrate their ability to conduct research rather than to



conduct groundbreaking research. Regrettably, these data suggest a lack of grounded theory research. It may be incumbent on research institutes that study distance education to encourage students to engage more in theory-based research. They might also consider more carefully the analysis methods used and the degree to which analysis techniques align with the data collection methods.

On a more positive note, we were encouraged to see a notable trend away from instructional media studies that compare distance education with traditional instructional practices. Evaluation that involves methods testing has been a consistent incentive for conducting research; however, between 1998 and 2007 far fewer graduate research projects attempted to determine the merit or worth of the specific distance education practice by making explicit comparisons with traditional face-to-face learning environments. This decrease might indicate that we, as a community of researchers and perhaps society in general, are beginning to accept distance learning as an important and viable educational experience in its own right.

Another encouraging finding is the decreased number of studies focused on technology issues, particularly concern about the quality of technology and the ability of distance educators to provide an acceptable technology-enabled learning experience. By most measures, the quality and availability of educational technology in schools has increased significantly as has the technological literacy of teachers and students (McMillan-Culp, Honey, & Mandinach, 2005; Russell, Bebell, O'Dwyer, & O'Connor, 2003). This progress has not eliminated technology problems, but those in a distance learning setting seem to have accepted that technology problems will occur, and they cope with the challenges associated with technology use when they happen. This is a potential topic for further research.

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## ***Student and Faculty Perceptions of the Quality of Online Learning Experiences***

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### **Abstract**

Some faculty members are reluctant to offer online courses because of significant concerns relative to the impact of such formats on the quality of instruction, learning, and participant interaction. Faculty members from The University of Southern Mississippi implemented synchronous interactive online instruction (SIOI) in the spring of 2007. This article explores the rationale for use of the particular technology, faculty conclusions regarding implementation of the technology, and the impact of the technology on instruction and learning. Comparisons by students of the quality of the learning experience in this environment with the quality of learning in face-to-face and asynchronous online learning environments were also analyzed.

The study finds that instructors and students view SIOI favourably. The mean student ratings for the dimensions of instructional quality were the same for SIOI and face-to-face course formats in all but one dimension, but mean ratings for SIOI and face-to-face formats were consistently higher than those for asynchronous online instruction. The single exception was for the dimension, ease of access to the course; the SIOI and asynchronous online formats were rated higher than the face-to-face format in this quality dimension. These findings suggest that it is possible to achieve levels of effectiveness in an online instructional format similar to those that are realized in face-to-face delivery. However, there is slight, though not statistically significant, evidence of concern about the quality of student collaboration in SIOI-enabled courses. Thus, instructors will need to capitalize on available mechanisms for interaction and collaboration.

**Keywords:** Internet in education; discussion in education; web-based instruction; online courses; instructional effectiveness in higher education

Most universities now offer some coursework online and some have converted programs of study in order to make them entirely available online. Approximately 4.6 million college students in the USA took at least one online course during the fall semester of 2008; this number doubled the 2.3 million students who took online courses in the fall of 2004 (Allen & Seaman, 2010; Allen & Seaman, 2006). In 2009, 73% of higher education institutions reported growth in demand for online courses and programs (Allen & Seaman, 2010). Most chief academic officers in universities (58%) perceive that online learning is critical to the long-term instructional strategies of their institutions.

In spite of the proliferation of online course-taking, many university faculty members are reluctant to teach courses via the Internet. In the fall of 2004, 26% of chief academic officers noted that “lack of acceptance of online instruction by faculty” is a significant barrier to the large-scale implementation of online courses” (Allen & Seaman, 2006, p. 13). As of fall 2009, only 31% of these university administrators agreed that faculty perceive online instruction as valuable and legitimate.

Interaction is a pivotal element of a powerful learning environment (Kester, Kirschner, & Corbalan, 2006). However, “educators do not yet know what forms of interaction people need, want, or expect to support their learning; and until we fully understand what it is about face-to-face interactions that enhance learning, we cannot know what features are required for an online system” (Wanstreet, 2006). It is this caveat that inspired the present study.

## **Purpose and Description of the Study**

Examining and illuminating the perspectives of instructors and students who are involved in online courses can offer insights into the utility of various types of online instruction for graduate-level courses. The particular research focus on instructors and students using a synchronous technology with unique audio features provides insights into the medium’s impact upon the concerns of instructors relative to course quality in online learning environments. Relatively little literature exists on instruction via synchronous online technologies that enable two-way audio interaction between instructor and students. The researchers describe this course delivery platform as *synchronous interactive online instruction* (SIOI). Using a mixed-methodology approach, the authors examined an online course medium used in graduate-level courses in educational leadership from two vantage points: 1) instructor perceptions regarding the quality of courses delivered via online instruction, and 2) student perceptions regarding the quality of courses delivered via online instruction.

## **Theoretical Framework and Related Review of Research Literature**

While acknowledging that some instructors are reluctant to offer online courses because of entrenched approaches to instruction and/or ineptitude with instructional technologies, this study examines instructor reticence based on concerns over perceived inadequacies of online environments to attend to certain features of teaching and learning. Many instructors who are otherwise comfortable with technology in instruction cite concerns about online formats. They

express concern over reduced human interaction, technology malfunctions, variable technology proficiencies of students, and increased faculty workload (Beard & Harper, 2002). The authors chose to explore very specifically instances in which the resistance to online instruction was described by university professors – each of whom was comfortable and proficient with a number of computer and online applications – as a product of their concerns over the quality of teaching and learning in such venues. The researchers focused on three areas of theory that undergird conceptualizations of desirable learning environments: pedagogical orientation, social constructivism, and immediacy and interaction. The related review of research addresses primarily three types of learning environments: face-to-face instructor and student instruction; asynchronous online instruction; and synchronous instruction, including two-way audio enhanced online formats.

## **Pedagogical Orientation**

The pedagogical orientations espoused by university instructors are pivotal as they consider the merits (or absence thereof) of online instruction. Core courses in professional schools are heavily oriented toward practitioner tasks (e.g., scenarios, simulations, practica, etc.). These are typically complex learning situations, integrating content across multiple disciplines. Such tasks promote deep learning and heighten prospects of successful transference of knowledge and skill to subsequent professional practice (Van Merriënboer, 1997). According to Newmann and Wehlage (1993), several conditions characterize authentic learning activities: analysis based upon depth of knowledge, dependence upon higher order thinking, substantive dialogue, social support for learners, and real-world applicability. Thoughtful presentation, demonstration, monitoring, and feedback positively impact student mastery of novel and complex material (Chen & Shaw, 2006).

Van Merriënboer and Kirschner (2001) distinguished between a world of knowledge and a world of learning. “In the world of knowledge, designers construct methods by which given learning goals in a specific subject matter domain can be attained by the learner. In the world of learning, ...designers focus on methods enhancing deep level learning, intrinsic motivation, and collaborative argumentation” (p. 430). Kester, Kirschner, and Corbalan (2006) describe learning environments in which 1) complex learning occurs, 2) student motivation for learning is intrinsic, and 3) dialogue and debate are integral elements.

Various researchers have addressed the issue of quality in college-level teaching. Onwuegbuzie Witcher, Collins, Filer, Wiedmaier, and Moore (2007) found that college students believe teachers are effective when they are responsive, enthusiastic, student-centered, professional, and expert. Students further perceive their instructors to be effective when they provide multiple opportunities for student and professor interactions, impart critical information clearly and accurately, and organize the learning environment so that time is used well and the environment is orderly. Based upon some 50 years of research on college pedagogy, Chickering and Gamson (1987) developed seven dimensions of practice that have been widely accepted as criteria of quality in university instruction. An instructor is effective when he/she does the following:

- encourages student-faculty contact



- encourages cooperation among students
- encourages active learning
- provides prompt feedback to students
- emphasizes time on task
- communicates high expectations
- respects diverse talents and ways of learning

The degree to which such dimensions of instructional effectiveness are fulfilled is impacted not only by instructor behaviors and characteristics, but also by the techniques and media through which instruction is delivered. Many instructional techniques that work well for simple tasks do not work well for complex tasks. Learners who are confronted with new and difficult material typically are not organized in their thought processes, nor is it clear to them how to prioritize and focus upon the most salient information in order to independently proceed with related learning tasks (Ormrod, 2004).

The degree to which online learning can attend to multiple dimensions of teaching and learning is of paramount interest to the instructor. While online content is more accessible, obtaining information is only one stage of gaining command over complex content. Hofer, Yu, and Pintrich (1998) found that self-regulation of learning is difficult for most students. Students in online courses often have difficulty with comprehension and application of information (Schwartzman, 2007). Oh and Jonassen (2007) assert that merely providing information to students is insufficient – the nature of discourse in asynchronous online courses (postings and threaded discussions guided by the instructor) aligns poorly with the inherent complexity of learning processes associated with mastering complex course content.

## **Constructivism**

Driscoll (2000) describes constructivism as a theory of learning that assumes that knowledge is constructed by learners via a formative process that relies not only on what is transmitted by the medium (instructor, text, audiovisual source) but also on the manner in which the learner makes sense of content within the context of his/her existing knowledge and experiences. Social constructivism extends these notions by asserting that learning is greatly dependent upon the interactions, collaboration, and social exchanges that occur in that learning context. Woo and Reeves (2007) outline multiple criteria for learning environments consistent with these theoretical orientations: Instructors who base learning environments upon these principles will 1) engage learners in authentic learning tasks; 2) create opportunities for meaningful collaboration among the instructor, experts, and other students; 3) engage the students themselves in defining, implementing, and negotiating perspectives relative to these tasks; 4) use collaboration, debate, and analysis to refine and complete the learning tasks; and 5) assure that students have access to the instructor, resources, and one another in order to clear points of confusion and expand concepts. “Such a meaningful interaction process is required for meaning making and hence learning (Woo & Reeves, 2007, p. 20).



Such approaches to teaching and learning have significant implications for the nature of the classroom and related environments. The instructional applications of email, online resources, typed threaded online discussions, and interactive online audio technologies need to be very deliberately designed if they are to ensure that learning environments consistent with the principles of constructivism are provided. Such design requires “change in pedagogical thinking toward student-centered classrooms with lots of constructivist, project-based activities, with opportunities for social discourse and collaboration between teacher and student, and between student and student” (Creighton, 2003, p. xiii). The difficulty of doing these things well online is the basis for the conclusion by Woo and Reeves that “despite the obvious advantages of the Web, relatively few authentic web-based learning programs have been developed and implemented at various levels of education” (p. 21). Others assert that computers and the Internet have exponentially expanded access to authentic instructional experiences via simulation, access to information and experts, virtual access to remote locations, complex manipulations of data, and sophisticated presentation capabilities (Woo & Reeves, 2007; Herrington et al., 2004). Comparing the capacities of face-to-face, online asynchronous, and online synchronous learning to facilitate knowledge transfer, Chen and Shaw (2006) found that for instruction sustained over substantial periods of time, there were no differences in learning outcomes among the three instructional modalities.

Various authors have studied collaboration among students in three instructional modalities: face-to-face, online synchronous, and online asynchronous sessions. Students tend to collaborate more extensively in the face-to-face and synchronous online sessions (Mabrito, 2006; Meyer, 2003). Meyer (2003) found that students believed that their contributions to asynchronous collaboration were of higher quality because of the expanded availability of time to craft and edit their postings.

The potential of web-based learning to enhance dimensions of constructivist learning approaches is significant, yet Woo and Reeves (2007) argue that the potential remains largely untapped in college classrooms. Wang and Woo (2007) found that the responsiveness of the instructor, interaction and communication between class participants, and the quality of the learning climate were lower in asynchronous online classes than in face-to-face instruction.

## **Interaction and Engagement**

Theories of interaction and engagement are integrally connected to social constructivism. For students and instructors, interaction is an important dimension of university course work. Hirumi (2002) notes, however, that only certain dimensions of interaction are significantly related to higher achievement. Interaction that a) prompts intellectual insight, b) provokes analysis, and c) deepens commitment to instructional activities influences the quality of learning; sharing personal observations is of limited value. Savery and Duffy (1995) contend that the active engagement of students in discourse during analysis of complex problems prompts learning through comparative mental processes and enriches application of content to other problem-solving circumstances. The quality of interaction and engagement between instructor and students is related to both

student performance and to satisfaction; so, too, is the quality of collaboration among students themselves (Chickering & Gamson, 1987; Onwuegbuzie et al., 2007).

Perceptions of quality and level of immediacy and engagement in face-to-face and online instructions may differ. Bernard, Brauer, Abrami, and Surkes (2004) define online interaction as the ability to collaborate with peers and instructor. Wanstreet (2006) found that online interaction both between learners and between learner and instructor addresses learning-style preferences of students. The nature of interaction is, by extension, an important consideration in the design of online learning and in students' evaluations of the quality of their experiences in such courses. While a number of features of online course work lend themselves to interaction, the degree to which they fulfill student needs for interaction and immediacy can vary significantly.

Many researchers and experts laud the capacities of online media to enhance interaction and engagement. Threaded discussions, online chat, email, and, in some instances, two-way audio and video feeds expand the nature and richness of interaction. The asynchronous timing of much of this interaction also conforms better to the schedules of some students. "Technology provides an electronic learning milieu that fosters the kind of creativity and communication needed to nourish engagement" (Kearsley & Shneiderman, 1998, p. 7). Ho and Swan (2007) note the capacity of online instruction to assure a more democratic approach to interaction because domination of the online "dialogue" by any one individual is less likely to occur. They also found that frequency, manner, and quality of contributions were positively correlated with final course grades.

Other researchers raise questions about the quality of interactions online. Wanstreet (2006) observed that research that reflects positively on online communication in college courses typically focuses more upon the quantity rather than quality. Zhang and Walls studied the degree to which online instruction addressed the previously described dimensions of instructional effectiveness developed by Chickering and Gamson. They found that the elements of "encouraging cooperation among students and encouraging student-faculty contact were least frequently practiced" in online instruction (Zhang & Walls, 2006, p. 420). Mazzolini and Maddison (2005) noted that the frequency, timing, and nature (e.g., clarifying, posing questions, answering questions) of an instructor's contributions to online postings and threaded discussions are negatively correlated with the frequency and length of student postings.

## **Summary**

The literature on the capacities of online instruction to address important dimensions of effective college learning environments is mixed. Of great significance to the present study was the dearth of literature addressing certain online instructional delivery systems, such as synchronous interactive online instruction. SIOI technology, which is still relatively new, provides synchronous online classrooms that are enhanced by two-way audio features that allow real-time oral presentation, discourse, and checks for understanding among instructor and students. The absence of such studies, however, makes it particularly difficult to draw conclusions about the

capacity of this form of online learning to address key elements of instructional effectiveness and to compare these capacities to those inherent in face-to-face and online asynchronous classrooms.

## **Methodology**

### **Introduction**

This study examined the SIOI course medium from two vantage points: 1) instructor perceptions regarding the quality of courses delivered via online instruction, and 2) student perceptions regarding the quality of courses delivered via online instruction.

### **Qualitative Study of Instructor Perceptions**

The qualitative component of this study addressed instructor perceptions regarding the quality of courses delivered via online instruction. Qualitative research involves an examination of what people said about their experiences, dispositions, and thoughts as they relate to a specific phenomenon. Heidegger (1962) described the phenomenological approach as “that which shows itself in itself” (p. 51). Crotty (1998) noted phenomenology is an attempt to gain an in-depth understanding of the human experience.

Specific research questions were examined within the context of the qualitative study that examined instructor perspectives regarding online courses:

Were there challenges to implementing a synchronous interactive online instructional (SIOI) format?

Was the process of social interaction in the SIOI environment productive?

Were professors able to provide a quality learning experience via SIOI format?

In the spring of 2007, the University of Southern Mississippi provided SIOI technology for professors interested in a course delivery system that employs a synchronous interactive online instructional format. The following semester, the researchers proceeded with participant selection and research processes pursuant to the phenomenological tradition. The population ( $N = 14$ ) for the qualitative study of instructor perceptions regarding the quality of courses delivered via online instruction included all professors teaching SIOI-enabled courses at the University of Southern Mississippi. Seven (50%) of the faculty members responded.

Survey research was the method used for gathering data from faculty participants who were implementing SIOI technology. A structured questionnaire, which also contained opportunity for open comments, was developed. Qualitative data analysis involved identifying, coding, and categorizing patterns found in the data.

Having coded and analyzed the data, a narrative was prepared to further disseminate research findings. The individual's interpretation of an event comprises reality for that individual (Bogdan & Biklen, 1982). The goal of the researcher is to understand the research environment, the individuals, and their behavior. Glesne and Peshkin (1992) noted that analysis is an immediate and ongoing process of qualitative research.

## **Quantitative Study of Student Perceptions**

Specific research questions were explored within the context of the quantitative study that examined student perceptions regarding the quality of courses delivered via online instruction:

What are students' perceptions regarding the quality of their learning experiences in synchronous interactive online instruction (SIOI)?

Are there statistically significant differences among the ratings of students regarding the degree to which course quality criteria are met through face-to-face, asynchronous online, and synchronous interactive online instruction (SIOI) course formats?

Is there a relationship between demographic characteristics of students and their perceptions regarding the quality of their learning experiences with synchronous interactive online instruction (SIOI)?

Is there a relationship between demographic characteristics of students and their perceptions of the degree to which course quality criteria are met through face-to-face, asynchronous online, and synchronous interactive online instruction (SIOI) course formats?

In the spring of 2007, the University of Southern Mississippi provided SIOI technology for professors interested in a course delivery system that employs a synchronous interactive online instructional format. The sample population for the quantitative study of student perceptions regarding the quality of courses delivered via online instruction included all students enrolled in SIOI-enabled graduate courses included in the program of studies for educational leadership at the University of Southern Mississippi during this and four subsequent semesters.

The quantitative study of student perceptions employed a survey instrument designed by the researchers and entitled Survey of Opinions of Users of SIOI. The instrument included items through which survey completers provided demographic information, assessments of their proficiencies with various computer applications, and assessments of the utility of particular utilities of the SIOI technology. A section of questions regarding overall impressions regarding this medium was included. Numerous authors have, over time, assembled models that outline criteria to assess the quality of teaching and learning in university courses. Chickering and Gamson's (1987) dimensions of effective college instruction were adapted to provide a section in which students compared the capacities of face-to-face delivery, SIOI, asynchronous online

instruction, and other online modes of course delivery. Data were analyzed using descriptive, differential, and correlational statistical techniques.

## Results

### Qualitative Study of Instructor Perceptions

Relatively few instructors at the University of Southern Mississippi in 2007 delivered courses via synchronous interactive online instruction (SIOI). Of the 14 using this platform at the time of this study, seven (50%) participated. Users and respondents were broken down as follows: College of Education and Psychology – 6 users, of whom 5 responded; College of Science and Technology – 7 users, of whom 1 responded; College of Business – 1 user, who also responded. In light of this relatively small number, the researchers view the data from this portion of the study to be a work in progress. That said, early analysis of results yielded findings of interest.

Research Question 1: Were there challenges in implementing a synchronous interactive online instructional (SIOI) format?

Table 1

#### *Challenges Confirmed and Identified by Respondents*

Question 1	(5) Strongly agree	(4) Agree	(3) Neutral	(2) Disagree	(1) Strongly disagree	(NA)
Implementing a synchronous interactive on-line instructional format (SIOI) presented certain challenges.	<i>n</i> = 3 43%	<i>n</i> = 2 29%	0	<i>n</i> = 1 14%	0	<i>n</i> = 1 14%

Five respondents (72%) agreed or strongly agreed there were significant challenges associated with the implementation of SIOI. Challenges identified by professors in this study were three-fold. Technical issues, mastery of the SIOI collaborative operating system, and, lastly, the necessary time commitment related to planning and preparation were identified.

Technical issues included but were not limited to audio difficulties, Internet access and connectivity issues, log-on problems, and WebCT inaccessibility. Learning and then practicing to become proficient with all the “bells and whistles of this medium” presented a different set of challenges for respondents. One professor noted, “It takes time for the use of the console to become second-nature.” SIOI requires a continuous technology focus and therefore, “... trying to teach and troubleshoot technology problems was also quite challenging.” The fact that everything happens in real time is another consideration. Lastly, one respondent admonished, “...plan well ahead of time to insure content, pedagogy, and technology goals are met...the time commitment is quite high in terms of getting the students and presenters ready for a problem-free live classroom session.”

Research Question 2: Was the process of social interaction in the SIOI environment productive?

Table 2

*The Nature of Social Interaction in SIOI*

Question 2	(5) Strongly agree	(4) Agree	(3) Neutral	(2) Disagree	(1) Strongly disagree	(NA)
Social interaction between instructor/ students and student/students was a meaningful and productive process in the SIOI experience.	<i>n</i> = 2 29%	<i>n</i> = 4 57%	0	0	0	<i>n</i> = 1 14%

Six respondents (86%) agreed or strongly agreed social interaction between instructor/students and student/students was a meaningful and productive process in the SIOI experience. Respondents indicated social interaction can be enhanced by using multiple console features such as “chat box...online polling...email...telephone outside of class...meeting in groups...meet and greets prior to class...and breakout rooms for some class activities.” This category emphasizes utilization of tools within SIOI to accentuate the social interaction process.

A second area of interest was the students’ and professors’ purpose for social interaction within the synchronous interactive online instructional format. Collaboration is viewed by the researchers as a dimension of the process of social interaction. As one respondent noted, “If the social interaction fails to be meaningful then the process will soon become unproductive.” Adding emphasis to this point, another respondent observed, “As with learning communities themselves, students return again and again to valuable information sources...to the extent that collaboration is meeting the needs of the learner it is a valuable student-centered entity.” Advancing this perspective on the role of “purpose” in social interaction, another respondent concluded, “The success of live classroom [SIOI] is more dependent on the facilitation and front-end work by the instructor.” However, one respondent advanced the concept that students seek to find a purpose through identity; he noted, “During this [social interaction] process they [students] struggle to forge an identity in the new online environment.

Research Question 3: Were professors able to provide a quality learning experience via SIOI format?

Table 3

*Respondents' Comments on Quality Learning*

Question 3	(5) Strongly agree	(4) Agree	(3) Neutral	(2) Disagree	(1) Strongly disagree	(NA)
The instruction offered through SIOI provided a quality learning experience for students.	<i>n</i> = 3 43%	<i>n</i> = 3 43%	0	0	0	<i>n</i> = 1 14%

Positive student evaluations [ratings] were mentioned by some respondents as evidence of a quality learning experience. One respondent noted, “I base this seemingly self-congratulatory rating on the anonymous ratings of students.” Another shared, “Live classroom was rated by students as the most beneficial aspect of the course offering.” Student opinion with regard to quality learning was an important factor for professors. Several respondents were aware of student perceptions; one declared, “Based on previous student feedback, many felt that 3-4 live classroom sessions is all that is desired.”

There is a solemn warning as one respondent observed, “The SIOI application is often criticized because of frequent technological lapses... a negative image tends to label the learning experience as unreliable, burdensome and unproductive.” The implication was that frequent user problems will brand the SIOI technology unfairly. Still another respondent offered a conditional perspective; he noted, “The quality learning experience seems directly proportionate to the institution’s commitment to service and support.”

Two respondents qualified their responses when commenting on whether SIOI provided a quality learning experience. The first responded, “The verdict is still out because I have two different experiences as I have presented.” Again, the respondent is referencing frequent technological problems as a matter of concern. The other respondent in this category acknowledged a good evaluation but concluded, “I know we can get better—and will!”

Six respondents (86%) agreed or strongly agreed that the instruction offered through SIOI provided a quality learning experience for students. In summary, the professors as respondents indicated student evaluations, problem-free online sessions, and continuous service/support from the university were determinants in the quality learning process.

A final question was posed to respondents. Instructors were asked whether, as a result of using SIOI, they were likely to continue to offer courses in this instructional format. Five of the respondents (72%) indicated that they were more likely to offer courses online because of this instructional format. One indicated that SIOI had no impact on the willingness to offer courses online. None of the respondents indicated that they were less likely to offer courses online.



Table 4

*Respondents' Inclination toward Future Use of SIOI Format*

Question	(1) I am more likely to offer online courses because of this instructional platform.	(2) This instructional platform has not affected my willingness to offer online courses.	(3) I am less likely to offer online courses because of this instructional platform.	(4) Other (please construct your own response):
SIOI affected my attitude toward online course delivery in the following manner:	<i>n</i> = 5 72 %	<i>n</i> = 1 14%	0	<i>n</i> = 1 14%

### **Quantitative Study of Student Perceptions**

The Survey of Opinions of Users of SIOI was administered to all students enrolled in SIOI-enabled graduate courses included in the graduate program of studies for educational leadership at the University of Southern Mississippi. Surveys were administered to 124 students, and 95 completed the instruments, thus providing a response rate of 77%.

The survey instrument administered to students in SIOI-enabled classes included questions regarding demographic descriptors of the participants. Among the 93 respondents reporting age, ages ranged from 24 – 60 years, with the majority (*n* = 45) falling between 30 and 39 years. Twenty-nine students were between 40 and 49 years. Eleven participants were younger than 30 years and eight were 50 years and older. The mean age was 37.84 years.

Females comprised nearly two-thirds of the sample (61.1%, *n* = 58); whereas, males made up 38.9% (*n* = 37). Among those reporting professional role, respondents included teachers (68.9%, *n* = 62), administrators (20%, *n* = 18), and ‘other’ (11.1%, *n* = 10).

Research Question 1 was stated as follows: “What are students’ perceptions regarding the quality of their learning experiences in synchronous interactive online instruction (SIOI)?” Question 14 on the survey was stated as follows: “On a scale of 1 to 5, with 1 being the lowest rating and 5 being highest, what rating would you give to your overall experience with SIOI in this course?” Table 5 illustrates both the mean and the frequencies associated with each rating.



Table 5

*Mean and Frequencies of Ratings of Overall Experience with SIOI*

	<i>N</i>	Mean
Mean of participants' ratings	92	4.24
Frequencies		
Rating 1 (lowest rating)	0	
Rating 2	3	
Rating 3	9	
Rating 4	43	
Rating 5 (highest rating)	37	

Research Question 2 was stated as follows: “Are there statistically significant differences among the ratings of students regarding the degree to which course quality criteria are met through face-to-face, asynchronous online, and synchronous interactive online instruction (SIOI) course formats? The pertinent item (Item 17) of the survey instrument was stated as follows:

Using the criteria in the table below, rate the dimensions of instructional effectiveness in courses delivered in the following formats:

- SIOI
- Asynchronous online format
- Face-to-face
- Other distance delivery format (e.g., closed circuit video link connecting instructor/classroom).

The scale used is 1 to 5, with 1 being the lowest rating and 5 being highest.

The mean student rating for the quality of each course format relative to each dimension of instructional effectiveness is provided in the related column of Table 6. Because of the nature of the wording of the questionnaire items to align with Chickering and Gamson’s seven principles, it was not possible to determine a summary rating for each of the three class formats and make a direct overall comparison. However, in comparing each of the dimensions across the three formats, several differences were suggested. ANOVA’s were employed to discern these differences among ratings of each dimension of instructional effectiveness among the SIOI, asynchronous online, and face-to-face modes of delivery.

Student ratings for the following dimensions of instructional effectiveness were not significantly different when contrasting face-to-face and SIOI formats; however, the ratings for both face-to-

face and SIOI formats were significantly higher than the ratings for asynchronous online learning ( $p < .001$ ):

- encouraged student-faculty contact
- encouraged cooperation among students
- encouraged active learning
- provided prompt feedback to students
- emphasized on time on task
- communicated high expectations
- respected diverse talents and ways of learning.

Three dimensions of instructional effectiveness in courses taken were added by the authors to those developed by Chickering and Gamson (1987). Students were asked to rate the quality and amount of content learned across the three instructional formats. There were significant differences in the perceptions of quality of learning when comparing different formats ( $p < .001$ ). While SIOI ( $M = 4.71$ ) and face-to-face ( $M = 4.73$ ) formats were not different from each other, both were rated higher than the asynchronous format ( $M = 3.96$ ). Student ratings for the degree to which the SIOI format assured ease of access to the course were not significantly higher than the ratings for the asynchronous online learning format. The ratings for both were significantly higher than the ratings for the face-to-face format in this quality dimension ( $p = .023$ ). Student ratings for the degree to which the various formats minimized costs (other than tuition) of taking the course were not significantly different for SIOI and asynchronous formats, but both were significantly higher than face-to-face format ( $p = .034$ ).

Table 6

*Mean Student Ratings of the Quality of Course Formats Relative to Dimensions of Effective College Instruction*

Dimensions	SIOI format (SIOI) Mean, <i>SD</i>	Min - Max	Asynchronous online format Mean, <i>SD</i>	Min - Max	Face-to- face format	Min - Max
The quality and the amount of the content learned	4.71 (.622)	2-5	3.96 (.735)	3-5	4.73 (.450)	4-5
Encouraging student-faculty contact	4.34 (.814)	2-5	2.84 (1.09)	1-5	4.67 (.596)	3-5
Encouraging cooperation among students	4.04 (1.26)	1-5	2.69 (1.14)	1-5	4.38 (.979)	1-5
Encouraging active learning	4.29 (.991)	1-5	3.01 (1.02)	1-5	4.40 (.904)	1-5
Providing prompt feedback to students	4.41 (.825)	2-5	2.89 (1.02)	1-5	4.48 (.690)	3-5
Emphasizing time on task	4.21 (1.13)	1-5	3.05 (1.28)	1-5	4.31 (.924)	1-5
Communicating High Expectations	4.45 (.932)	1-5	3.26 (1.24)	1-5	4.54 (.645)	3-5
Respecting diverse talents and ways of learning	3.97 (1.16)	1-5	2.94 (1.25)	1-5	4.26 (1.02)	1-5
Ease of access to the course	4.39 (1.04)	1-5	4.09 (1.23)	1-5	3.70 (1.07)	1-5
Minimizing costs (other than tuition) of taking course	3.97 (1.27)	1-5	3.68 (1.31)	1-5	3.57 (1.22)	1-5

Research Question 3 was stated as follows: “Is there a relationship between demographic characteristics of students and their perceptions regarding the quality of their learning experiences with synchronous interactive online instruction (SIOI)?” Items 14 – 16 on the survey read as follows:

14. On a scale of 1 to 5, with 1 being the lowest rating and 5 being highest, what rating would you give to your overall experience with SIOI in this course?

15. Would you take another course via SIOI? (Yes, No, Maybe)

16. Would you recommend a course taught via SIOI to others?  
(Yes, No, Maybe)

The mean rating for overall experience with the SIOI format (item 14) was 4.24 on a 5-point scale. In response to item 15, "Would you take another course via SIOI?," seventy-five (85.2%) answered "yes," ten (11.4%) said "maybe," and three respondents (3.4%) said "no." When asked whether they would recommend a course taught via SIOI to others (item 16), 84.5% responded "yes," 12.8% responded "maybe," and 2.6% said "no." Chi-square analyses were employed to evaluate relationships among gender or professional role and the responses to items 14, 15, and 16. No significant relationships were discerned. While not statistically significant ( $p = .051$ ), there is some indication that the reported overall experience with SIOI format is negatively related to the age of the respondent.

Research Question 4 was stated as follows: Is there a relationship between demographic characteristics of students and their perceptions of the degree to which course quality criteria are met through face-to-face, asynchronous online, and synchronous interactive online instruction (SIOI) course formats? Chi-square analyses were employed to evaluate relationships among professional role and the responses to the items addressing dimensions of instructional effectiveness, which are profiled in Table 6. No significant relationships were found with the exception that teachers, less so than administrators, reported that the asynchronous format respects diverse talents and ways of learning. In comparing gender ratings for SIOI, asynchronous, and face-to-face dimensions, there were no differences for the asynchronous dimensions. Females rated the quality and amount of content learned somewhat higher than males (females,  $M = 4.81$ ; males,  $M = 4.67$ ) for the SIOI, as well as for face-to-face course formats, though the differences were not significant. Females did, however, rate quality and amount of content learned significantly higher than males for asynchronous format courses. Females also rated the respecting of diverse talents and ways of learning higher in the SIOI format than did the males. T-test analyses further revealed gender differences in student perceptions of several dimensions of instructional effectiveness when face-to-face instruction is used. The ratings of women concerning the degree to which the face-to-face format encouraged both cooperation among students and active learning as well as assured the provision of prompt feedback to students, emphasis on time on task, and the communication of high expectations were significantly higher than the ratings given by men for these same dimensions of instructional quality ( $p < .05$ ).

## **Discussion and Conclusions**

Many university instructors question whether the quality of learning achieved by students in a face-to-face environment can be paralleled in an online format, especially for novel and complex content. This study examined instructor perceptions of the merits of synchronous interactive online instruction (SIOI). Student respondents provided perspectives on the relative capacities of

face-to-face, SIOI, and asynchronous online learning to address dimensions of instructional effectiveness. Although corrections were used for the alpha levels before reporting significant differences among student ratings, these results should nonetheless be interpreted with some caution due to the large number of analyses employed. Additional caution is warranted in light of the relatively small number of participants and the fact that they were enrolled in a single professional discipline, educational leadership. Finally, a distinction needs to be drawn between *perceptions* of the quality of instruction/learning and the actual *measurement* of the quality of instruction/learning. This study addressed the former.

The analysis of responses suggests that while the format presents challenges, instructors view SIOI favorably. These respondents evaluated the quality of learning in these classes positively, and were, in general, pleased with the nature of student-to-instructor and student-to-student interaction in these classes. Given the literature's frequent references to the premium that instructors attach to these dimensions of learning, these findings are instructive, particularly to faculty members who are disinclined to offer instruction online.

Students also gave positive ratings to the overall quality of the learning experience in SIOI-enabled courses. A significant majority indicated that they would be willing to take another course offered in the SIOI medium, and a similar majority was willing to recommend the SIOI format to other students.

Based on dimensions of instructional effectiveness, students compared SIOI-enabled courses to those offered face-to-face and in an asynchronous online format. While the ratings of the amount and quality of content learned were the same for SIOI and face-to-face course formats, mean student ratings for the dimensions of instructional quality tended to be slightly higher for face-to-face instruction than for SIOI; these differences, however, were not statistically significant. These findings are important as they suggest to an instructor who is reluctant to employ online learning that students perceive that it is possible to achieve levels of effectiveness in an online instructional format similar to those that are realized in face-to-face delivery.

Asynchronous online learning, on the other hand, was perceived to be inferior to both face-to-face and SIOI formats in addressing dimensions of instructional quality. Mean ratings by students of the capabilities of asynchronous online learning to address these dimensions were consistently and significantly lower than the ratings for both face-to-face and the SIOI formats. These findings will likely reinforce the reluctance of some instructors to offer online instruction if the only option for delivery is an asynchronous format. As Barnes (2003) observes, "The online format must assist in making information more understandable and relevant to students."

Two additional dimensions of quality, ease of access and minimizing costs (other than tuition) of taking the course, were rated by students as being significantly higher for the two online formats than for the face-to-face format. In an era of escalating fuel prices, recessionary economic trends, and increasing awareness of access to online instructional opportunities, these are not surprising findings for course offerings that typically allow students access from home.

While not statistically significant, there is evidence of some concern relative to the quality of student collaboration in SIOI-enabled courses. The ratings for this dimension, as well as the dimension of student-faculty contact, were significantly lower for the asynchronous mode. These concerns are more significant when the results are analyzed by gender. The challenge to online faculty is obvious – for these important elements of instructional effectiveness to be adequately addressed, instructors will need to capitalize on those mechanisms for interaction and collaboration that are available.

Future study is warranted. As the use of synchronous interactive online learning expands in post-secondary instruction, it will be useful to survey additional instructors and students participating in SIOI-enabled courses. “The bottom line is that to increase the learning effects of online interaction, we should, first of all, understand clearly the nature of interaction within the framework of social constructivist learning theory. Once we gain such an in-depth understanding, we should be able to engage in productive research and development to identify the necessary design principles for implementing more effective interaction activities within Web-based learning environments” (Woo & Reeves, 2007, p.23).

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## ***Teaching and Learning Social Justice through Online Service-Learning Courses***

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### **Abstract**

Creating a virtual classroom in which diverse students feel welcome to discuss and experience topics related to social justice, action, and change is a study in the value of connectedness and collaboration. Through a combination of technologies, pedagogies, and on-site experiences, virtual cultures develop that encourage the formation of demanding yet stimulating learning environments in which communications and interactions are intellectually transformative. This article explores student perceptions of their participation in an online service-learning course while working in local service organizations. Qualitative methodology was used to identify the philosophical intersection at which multiple pedagogies meet: social justice, service-learning, civic engagement, and leadership as instructed in a web-based environment. This study illustrates the capacity for intentionally constructed online educational experiences focused on social justice, civic engagement, and leadership to affect learning and to provide educators with pedagogical best practices to facilitate requisite change in teaching practice.

**Keywords:** Social justice; experiential education; service-learning, leadership; online learning

### **Introduction**

Contemporary higher education has a responsibility to prepare students to solve social problems on local and global levels; to this end, teachers are challenged to enable as diverse a context for learning and living as possible (Hurtado, 2005). It is critical to educate students with respect to social issues in general and to address such issues within a context of justice and oppression (Goodman, 1995). Social justice, civic engagement, and leadership become a joint focus for collaborative discourse and action in an experientially based learning process that helps students to identify global injustices and oppression. Such opportunities assume exciting dimensions when facilitated in virtual learning environments. Directing communication and problem-based

analyses with geographically dispersed peers who do not come into physical contact with one another defuses what Merryfield calls “triggers of difference” and thus allows a measure of anonymity, which some students find empowering and essential to discovering their individual “voices” in the unfolding of difficult dialogues (2003, p. 160). Additionally, studying with a diverse group of participants naturally creates opportunities to compare and contrast a range of experiences occurring within local cultures and communities.

Instruction in the virtual classroom, when coupled with on-site service experiences, creates opportunities for a unique combination of learning activities constructed to be individually and collectively relevant and focused on real-world problems. Freire (1970) wrote that such “Problem-posing education affirms men and women as beings in the process of becoming” (p. 84), a foundational concept that guides education in general and that has specific implications for civic engagement situated in community-based learning. The following article explores social justice pedagogy in an online service-learning course, including an analysis of student perceptions of the impact of individual and collective experiences on learning outcomes. Examining the potential of such pedagogies in a virtual environment helps educators to identify the foundational best practices and technological tools that create supportive yet challenging virtual classrooms in which relevant and meaningful interactions become vital in meeting academic goals (MacKnight, 2000).

## **Literature Review**

Critical to the course focused on for this study is the integration of experientially based learning situated in local communities and facilitated so as to engage students from diverse backgrounds. To effectively implement social justice pedagogies instructors must do the following: 1) create virtual environments that enable ongoing communication, interaction, and relationship building; 2) develop a teaching approach that fosters autonomy and collaboration; 3) design and implement methodologies that afford opportunities for critical reflection and inquiry; and 4) deliver curricula through universally accessible technologies which support primary learning goals and the development of secondary skills (e.g., mastering Web site navigation and the use of software and hardware) (Guthrie & McCracken, 2010a). In combination, such methods can transform teaching and learning partnerships in ways that alter learning experiences and enrich individual awareness (Cranton, 2006; Lave & Wenger, 1991; Mandell & Herman, 2007; Rovai, 2002).

The online service-learning course of focus for this study examines community engagement from a positive social action framework, exploring a range of leadership styles and their capacities to enact broad change. As stated in curricular objectives, upon completion of this course students are to have developed an understanding of service-learning theory through the recognition of various historical models of leadership in social change movements. This process is encouraged through reflective teaching approaches that require students to consider the relationship between the individual and society within a contemporary American context. Such approaches are particularly powerful in online classrooms, as participants explore evolving values and ethics, applying them in diverse settings to facilitate civic engagement and community-based leadership practice (Merryfield, 2003). Further, students are required to identify strategies that promote social action,

exploring the potential for local and global change through collaboration with communities, at service sites, and among learning peers. Achieving these objectives requires that students focus on community service projects in which theories of social justice and leadership can be experienced and examined. A theoretical framework that combines experiential learning, service-learning, and social justice guided this study; such foundational ideas both conceptually anchor this study and provide a strong framework for continuous curricular development and assessment (Einfeld & Collins, 2008). Learning environments constructed to facilitate such a framework are discussed within the context of online teaching and learning.

## **Constructing a Context for Social Justice through Experiential Learning**

Elias and Merriam (1980) explained: “Theory without practice leads to an empty idealism, and action without philosophical reflection leads to mindless activism” (p. 4). The role of learning situated in experience is central to social justice pedagogy; as Ayers writes, “The fundamental message of the teacher for social justice is: You can change the world” (1998, p. xvii). As such, meaningful change is rooted in experience, which is particularly powerful when combined with opportunities for critical inquiry and reflective discourse. Among the most cited of educators, Kolb introduced experiential learning theory as the process of making meaning from direct experiences, “... the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience” (1984, p. 41). Kolb (1984) proposed two ways in which one assigns meaning to experiences: by engaging in concrete experience and subsequently by generalizing resultant learning beyond the immediate. He also proposed two ways in which one integrates experiences: through critical reflection regarding the experience and resultant learning and through active experimentation with learned concepts in new areas.

Educators have identified the importance of developing instructional environments that value experience, actively integrating it with evolving knowledge as students participate in community-based assignments (McBrien, 2008; Taylor, 2008). Such environments foster the development and sharing of knowledge gained through both individual experience and collaborative group processes (Brookfield & Preskill, 1999). They further allow learning to extend beyond the classroom environment, mobilizing a potential to assist broad constituencies as students apply developing concepts in local communities. (Merryfield, 2003). Such approaches incorporate a participant-centered focus, which acknowledge and utilize students’ experiences, skills, and knowledge, and allow students to apply expectations and priorities to current learning opportunities and to engage one another as peers and resources.

## **Service-Learning as a Means to Critical Inquiry**

Applied learning experiences have traditionally extended learning beyond the confines of traditional classrooms into students’ communities with the goal of orchestrating both personal and broad local impact. Researchers Stanton, Giles, and Cruz (1999) and Waterman (1997) identified service learning as an experientially based instructional approach with the two-fold purpose of

providing tangible service and meeting distinct academic goals. The connection to academic curricula and graded requirements differentiates academic service-learning, facilitated within a course structure and attached to credit generation, from co-curricular community service, completed outside the classroom, predominantly through volunteerism.

Service-learning theoretically integrates the two complex concepts of knowledge construction and community action, building on students' existing awareness of their local communities as well as the developmental learning that occurs in specific service placements (Holland & Robinson, 2008). Pedagogical objectives are achieved through intentionally structured curricula that promote the construction of knowledge and the development of reflective practice through collaborative inquiry and that incorporate methods such as targeted readings, interactive and goal-directed discussions, team and small group activities, reflective writing, and presentations. Because it is vital for learning to be connected to service in this pedagogical framework, opportunities for critical reflection and problem-based learning are integrated into all instructional activities and assignments.

## **Teaching for Social Justice**

Social justice pedagogy can be situated in several theoretical frameworks, including critical race theory (Tate, 1997; Yosso, 2005), identity development (Tatum, 2000), and socialization (Harro, 2000). The course in this study supports social justice education through a framework of service-learning and leadership. Teaching for social justice adds a complex dynamic to instruction that has the potential to excite and engage students in recognizing and reacting to obstacles to full humanity (Ayers, 1998; Greene, 1998).

In this context, the complexity of an educator's role reaches far beyond personal awareness, motivation, and experience; rather, it is focused on facilitating relationships. Connections with students in particular moments become the focus of the teaching and learning partnership. While learning requires choice and action from students, teaching requires relationship: the invitation to embark on journeys of personal development within an exploration of new information and theoretical frameworks. Social justice education becomes more than teaching about injustices; inherent in this pedagogy is a commitment to providing students with tools to work towards the goal of action on both local and global levels (Kincheloe, 2004).

Educators for social justice must create learning environments that include numerous entry points for learning and multiple pathways for practice and ongoing investigation (Ayers, 1998). The instructional environment must be at once supportive and challenging (Sanford, 1967). Situated in the framework of service-learning and leadership, this course strives not only to educate students about social justice issues, but also to empower them to lead others in creating action and change.

## **Using Technologies to Extend Instructional Impact**

A philosophical approach combining progressive attributes (focusing on the formation of active teaching and learning partnerships facilitated via collaborative problem solving), humanist attributes (promoting actualization through autonomy and self-directedness), and radical attributes (facilitating social change through individual and collective action) directed the selection of both instructional methods and technologies to shape teaching and learning processes, promote individual awareness and exploration, and guide locally based social action (Kanuka, 2008). Learning technologies assume a unique primacy when linking on-site learning experiences and virtual coursework with the overall goal of enabling students to engage with their local communities and to participate in relevant dialogue with geographically dispersed peers. When used in conjunction with instructional methods that promote reflection, inquiry, and collaboration, technologies enable participants to shift dialogue beyond one-dimensional information sharing to significant learning originating in experiential settings (Barab, Thomas, & Merrill, 2001). Meyers (2008) suggests that discussions structured to facilitate critical discourse and inquiry are particularly effective when carried on in virtual environments insofar as they encourage explorations of issues related to social equity; the results of this study reinforce his theory insofar as dialogue was successfully extended beyond classroom confines to distinctive communities throughout the United States and into Mexico and England.

Garrison, Anderson, and Archer (2000) found that virtual classrooms indeed provide environments in which reflective discourse is fostered and critical inquiry nurtured as a means to extend positive, collaborative educational transactions. Their community of inquiry model (2000) not only establishes a framework for realizing the potential of reflective, experientially based pedagogies in virtual learning environments, but also identifies important components essential to high-quality, accessible learning. A commitment to what the researchers (2000) refer to as teaching, social, and cognitive presence provides the foundation upon which to develop and instruct web-based curricula and in combination guided the design and implementation of the course at the center of this study. By uniting these key aspects of the instructional process, teachers formed meaningful partnerships with students that facilitated ongoing dialogue, fostered developing insight, and identified and documented individual and collective learning outcomes.

Educational technologies were selected based on their capacities to facilitate interaction, communication, and collaboration in order to generate shared learning goals and to solve common problems. Geographical differences were exploited or minimized as relevant to curricular outcomes through the strategic use of both synchronous and asynchronous activities and events. It was a priority to ensure continuous interactions between all stakeholders engaged in the service triad (which included students, teachers, and personnel in community-based organizations); this enabled a concerted focus on both curricular objectives and placements' priorities. To meet instructional goals, ongoing communications were facilitated within the structure of a learning management system in conjunction with the integration of asynchronous discussion boards, blogs, and email as well as synchronous chat, telephone usage, and virtual conferencing platforms that enable text, audio, and video interactions. Additionally, students were encouraged to utilize social networking and free video-sharing platforms to the extent that they

augmented their experiences in relevant ways. Finally, information management functions were enabled to distribute and archive course content, using document and file sharing, text-based lectures, podcasts, and e-books. While the technologies utilized in the instruction of this course are commonly used in educational settings, the combination of such telecommunications with experientially based learning uniquely compounded individual and collective learning outcomes as well as community impacts.

## **Methodology**

The purpose of this study was to explore student learning that resulted from participation in a web-based service-learning course at a small Midwestern four-year institution in the United States. The exploratory nature of this study determined the qualitative design approach.

## **Research Design**

Information about such student learning was constructed qualitatively through a survey and an interview. This approach draws upon the writing of qualitative scholars who present a constructivist approach (see, for example, Charmaz, 2000; Denzin & Lincoln, 2005; Guba & Lincoln, 2005) and tends to be less open and interpretive than the traditional constructivist assumptions. A constructivist approach assumes a relative ontology, a subjective epistemology, and a naturalistic set of methodological procedures (Guba & Lincoln, 2001). A relative ontology indicates that there are multiple realities; a subjective epistemology assumes that the respondent and knower co-create meaning, and a naturalistic set of methodological procedures investigates the natural world (Creswell, 1994). While findings using this constructivist paradigm are typically presented in terms of grounded theory or pattern theories (Guba & Lincoln, 2005), this approach examines the phenomenon of learning from a combination of online coursework coupled with on-site community service as presented through both written narratives and oral interviews. The field of qualitative research is constantly challenging the distinction between what is real and what is constructed. This comes through an understanding that all events are made real through interaction, discourse, conversation, and narratives (Denzin & Lincoln, 2005). This study attempted to understand the phenomenon of learning through qualitative survey and interview.

Demographic information related to participants as well as their initial reactions were obtained through the survey process; students were then invited to provide their contact information in order to participate in the interview component. The main task in the interview segment of the study was to develop an awareness of students' statements and their associated or underlying meaning (Kvale, 1996). Collecting information through combined survey and interview methods allowed students to identify and reflect upon insights related to the impact of their experiences inasmuch as they shared their perceptions of their lived world (Kvale, 1996). This led to the articulation of specific knowledge about personal learning, which, in turn, enhanced their awareness of meaning and relevance as well as their understanding of social justice pedagogy facilitated in a web-based classroom.



Description, analysis, and interpretation are three ways of organizing and reporting qualitative data (Wolcott, 1994), and these approaches to organizing and reporting data were used. After the 28 surveys were collected and the 15 interviews conducted, data was analyzed to identify both common themes and unique areas of learning. An explanation of the data collected after each of the interviews was constructed by describing additional elements, such as non-verbal communication identified through the process; such impressions were recorded immediately following the interviews and transcribed following their conclusion. Transcripts from the interviews were assessed and reviewed; data that aligned with potential codes were highlighted. Phrases and words were used to determine refined codes for each participant. Emerging themes were also identified when the same ideas surfaced in three or more student transcriptions. Once emerging themes were studied, relationships among those themes were examined. Two researchers analyzed this data separately, and only themes both researchers found were discussed. One researcher taught this course and the second researcher had no prior knowledge or experience with the course and looked strictly at the responses from the students participating in this study.

## **Participant Selection and Recruitment**

Potential participants were contacted by gaining access through the academic department at the small public Midwestern four-year institution where the study was conducted. Enrollment lists from the past three semesters in which a specific online service-learning course focused on social change and leadership were accessed. At the time of request, 57 students had completed the course and 42 students were still enrolled in courses at the university. Once a list of possible participants was verified each individual was contacted via email with a link to the online survey. Of the 42 students contacted, 28 completed the survey, for a 67% response rate. Of these 42 participants 17 consented to be interviewed and 15 students were actually interviewed or 36% of the total potential participant pool.

## **Course Description**

At the time of this study, the specific course used had been taught in an online format for five semesters. This course examines community engagement from a positive social change framework and explores how different leadership styles enact positive change. Topics related to social justice are specifically discussed throughout the course. Requirements include the completion of individual action plans, 60 hours of community service, reflection journals, participation in structured discussions, and reflective essays that conclude with final culminating papers. Students are asked to select non-profit agencies and organizations in which their service will be performed. Once service sites are selected and confirmed with agency representatives, students are asked to determine individual learning goals for successful completion of the community service experiences. A solid learning environment is created by providing an opportunity for students to apply learning in the classroom to an experience and by providing guidance in making meaning from a specific experience.



## **Results**

Of the 28 students participating in the study, 17 were between 20 and 24 years of age, five were between 25 and 29 years of age, three were between 30 and 40 years of age and three were between the ages of 41 and 55. Twenty-one students self-identified as Caucasian and seven self-identified as minorities; four were African-American, one was multiracial and two were Latino/a. The majority of students responding were female, with only 10 respondents male. Only one student lived outside of the United States at the time of the study. Twenty students identified themselves as full-time and seven students stated they only took classes online, which mirrored the institution's overall student demographics. Students participating in this study represented a wide range of disciplines. Business, including management and accounting majors, was the most represented, with nine students; five students were in criminal justice and legal studies, four students were studying computer science, four students were in communications, three in political science, two in psychology, and one in chemistry.

The data indicated that students studying social justice through a combined approach using online classrooms and on-site experiences did indeed report a positive impact on their learning. Specifically, three main themes emerged as having the most impact: learning new concepts or theories about social justice, engaging in critical discourse with peers related to social justice, and participating in opportunities for structured reflection about course materials and activities as well as on-site experiences.

### **Learning New Concepts of Social Justice**

In order to better understand student perceptions about the impact of the service-learning course, participants were asked to discuss their learning; this question was asked on both the survey and in the interview. Students participating in this study responded that they learned a new concept or theory in the areas of social justice, leadership, and/or civic engagement as a result of their participation. Specifically, six students learned something new in relation to social justice, five students reported having learned both new social justice and leadership concepts, four students noted that they learned new social justice and civic engagement concepts, and two students said they learned something new in all three areas of social justice, leadership, and civic engagement.

During the interview, one student stated that learning about the concepts inherent in social justice, leadership, and civic education made him more aware of them in his everyday life. He said,

I never really thought about leadership, social justice and volunteerism as being interconnected. This class not only told us how they were connected, but we could then see it in our service sites. Once I knew how to think about these topics, I could look for them. Service, social justice and leadership is [sic] everywhere and is [sic] seen every day. I would say that is the biggest thing I learned from this class.

Another student reported, “This course not only taught me concepts around service, leadership and social justice, but it gave me the opportunity to observe and even practice some of these concepts through my service.” This student explained how the course gave her the opportunity to experience the concepts she learned, providing a living laboratory in which to experience issues related to social justice and civic engagement.

Several students reported that they learned about the general concepts of social justice as actualized through placement experiences. One student said, “I had heard the term social justice, but really didn’t know what it meant. Now that I know, I am actually embarrassed that I did not really understand what it was about.” Another student emphasized, “The whole idea of social justice is what I learned. I live in a town where we are all the same. This class taught me that social justice is much more than a racial thing, much, much more than that.” Another student commented that specific concepts of social justice were especially valuable, noting, “The cycle of oppression that we learned when we were studying social justice made complete sense. I never thought about social equality in that way before.” Insight about students’ perceived impact of their participation in the online service-learning course contributed to possible best practices for educators interested in utilizing social justice pedagogy.

### **Fostering Critical Discourse Related to Social Action and Change**

To facilitate discussion about social justice, questions were posed on an asynchronous discussion forum inviting students both individually and collectively to consider assigned readings in view of the ways social justice issues were evidenced in their community service experiences. During the interviews, students were asked, “What are your reactions to discussing issues of social justice in this online course?” Of the 15 interviewed, all students stated that they learned from directed discussions with their peers. One student specifically said, “I did not even know what social justice was before this class. I really liked that we could talk about these issues and then experience them in our service. . . It totally makes sense to have a class like this.”

Ten students said they had never talked about such topics in an online class before. During the interviews, one student responded, “These were like no other discussions I have had in an online class. It made me think about how social justice issues play a role in not only my community service, but my daily life.” Another student noted, “When we first started talking about social justice issues a few of us were saying how we had never talked about such topics online before. It was a breath of fresh air.” Yet another student said, “I have never talked about social justice before, let alone in an online class before.”

When asked to describe their reactions to discussing these concepts via web-based discussion, seven students responded that they looked forward to conversations about social justice. One student said, “I loved the conversations we had in this class, especially when we were talking about social justice. The fact that students were all over the world doing service made these conversations especially interesting.” Another student said, “I looked forward to hearing other people’s experiences. Talking about a time we have been discriminated against and when we discriminated against someone was eye opening.”

Merryfield (2003) determined that online discussion “acts as a veil to protect people as they reveal, question, and take risks” (p. 154), explaining that when people have only text to respond to, they are attracted to people and respond to them based on what they have written: as evidenced through students’ self-reports, such experience can be profoundly different from oral discussions conducted in physical classrooms. Building community is especially important when facilitating conversations that hold the potential to be intensely personal and revealing. One student said, “When I first saw the possible controversial topics, I thought people would be disrespectful, but actually I learned more through these conversations and looked forward to them.” Student perceptions of their online conversations about social justice provide a meaningful understanding of the impact this pedagogy had on learning.

### **Facilitating Engagement through Structured Reflection**

The practice of critical and engaged reflection has a dramatic impact in facilitating learning around social justice, and the process is made particularly visible and interactive through the use of threaded discussions (Merryfield, 2006). Interview participants were asked, “In this course, what role did reflection play in your personal learning?” Of the 15 students interviewed, 13 students responded that reflection had a positive impact on their personal learning. One student stressed, “Reflection played a huge part in my learning. This course brought up things that I have never thought about. It made me look at the community service I was doing in a different light.” Another student emphasized that reflection was especially important to discussing social justice issues: “Just as our instructor told us, reflection is about making meaning. After our discussions, especially around social justice and the cycle of oppression, I could reflect in my journals which helped me get my thoughts straight.” A second student stated, “The reflection journals and reflective essays in this course gave me an opportunity or should I say forced me to think through the tough issues we were talking about, like inequality and social justice.”

### **Discussion and Implications**

Teaching focused on social justice and action anchored in service-learning and leadership theory hold a range of implications for post-secondary education, particularly in blended learning environments that effectively combine web-based instruction with on-site placement experiences in diverse communities. The results of this study indicate that it is possible to reach broad participant groups by raising awareness of commonalities as well as differences and by facilitating cognitive and affective connections to local and global issues, people, and contexts through the use of a variety of media-based applications. When combined with pedagogies that foster the development of critical dialogue, personal insight, and active engagement, such technologies can extend learning beyond regional confines and identities to enable individual growth and to increase capacities for understanding and awareness. Moreover, the rich dialogue generated through such courses has the potential for impact far beyond a single classroom and student as ideas and insights gleaned in online classrooms extend to a range of communities with anomalous strengths and needs.

Students participating in this study repeatedly remarked that opportunities for individual and collective reflection allowed them to develop a deeply personalized awareness of issues related to social justice, action, and change as they explored new ideas and applied them to past and present experiences with a focus on the continued generation of future ideals and goals. A combination of readings that promote cognitive growth, activities that encourage reflection and critical inquiry, and discussion-based analyses of real-time experiences occurring in on-site placements enabled a gradual and expanded consciousness that participants emphasized was not typically a component of their undergraduate learning. Hunt (1998) identified the importance of teaching for social justice as “a reminder. . . of the powerful stories which inspire us to work toward change, to make the world a better place” (p. xiii). Illustrating learning through such stories fostered insight into the complexity of social responsibility, and reflective discussions were often the means by which students constructed the meaning of such stories and experiences. While online technologies enable extended discussions, guiding students on such reflective journeys presents challenges for both teachers and participants. For example, when students are not able to fully utilize selected technologies, valuable instructional time may be lost in providing requisite technical training. Also, when interactions are not instantaneous, as a result of asynchronous participation, those all-important “aha” moments may be significantly delayed and critical teaching opportunities missed. It is therefore essential that teachers establish detailed criteria and schedules for responses and maintain frequent interaction with students as they reveal observations, insights, and critical analyses.

Individual experiences and backgrounds, learning styles, and academic competencies affect the conceptual development possible in a course that holds at its center very personal and often revealing interpretation. The use of educational technologies enables educators to reach a wide range of students who participate from multiple time zones, according to widely varying schedules, under sometimes challenging conditions, and in unique organizational and community settings. This level of diversity impacts not only the selection of technologies (for example, taking into account the ways individuals and organization access and navigate the Internet), but also course content and available resources that continue to be shaped throughout the academic term. Students themselves introduce a multitude of resources in the form of social networks, Web sites, news articles, and videos, each of which has the potential to effect curricular changes that affect learning outcomes. Such changes can enrich engagement, providing unique and timely alternatives that facilitate both individual and collective analyses. It is incumbent upon instructors to recognize and seize such opportunities to capitalize on the rich diversity in online classrooms to the extent that such changes enhance inclusion. Explorations of broader issues, such as socio-economic advantage and privilege and their relationship to accessing information technology and developing skills in information literacy and the role culture plays in interaction and communication, continue to be critical to ensuring that curricular goals and instructional methods are congruent with the larger academic field, pedagogical priorities, student experiences, and social realities (Guthrie & McCracken, 2010b).

Understanding issues related to social justice, action, and responsibility involves complex thinking about highly personal experiences. During this process, areas of new learning are integrated with thinking that continues to develop over time. To illustrate their evolving

awareness, participants share intimate details about their lives, successes, failures, and relationships; this process encourages an intensely personal instructional experience. Students often have not been exposed to a wide variety of social justice issues nor have they cultivated the cognitive or relational abilities necessary to identify and interpret key experiences that become essential to their learning. This meaning-making process requires that participants possess a high degree of self-directedness, autonomy, and motivation in order to optimally integrate learning experiences. The development of such skills, when coupled with learning new technologies, presents multiple challenges for management within a relatively short period of time (in the instance of this study, a sixteen-week semester). When teaching courses that require the development of such an expansive array of abilities, instructors must balance a wide variety of roles and responsibilities, many of which evolve based on the composition of both the classroom and the organizations in which students serve.

The results of this study reinforce previous research indicating that the combination of active discussions and intentionally structured assignments supports individualized reflection and collaborative learning when utilized within technology-rich learning environments (Palloff & Pratt, 2007; Tseng, Wang, Ku, & Sun, 2009). Students reported a strong sense of learning from open discussion and the mediation of difficult dialogues that ultimately reinforce complex understanding. While reflective and collaborative inquiry enhances connectedness and community building, supporting students with a wide range of competencies as they develop the skills necessary to generate and sustain such engagement on an ongoing basis requires close attention and continuous and active coaching. Sujo de Montes, Oran, and Willis (2002), as well as Kanuka (2008), remind us that computers are not culturally neutral but amplify the characteristics of those who design, promote, and use them. Sujo de Montes, Oran and Willis (2002) note, "Because the amplified characteristics are those of the dominant culture, students at the margins [continue to be] disadvantaged. As [online] classrooms become more culturally diverse. . . . it is not safe to ignore issues of race, ethnicity and power, or assume they are in the 'off' mode" because participants are not physically visible (p. 268). Teachers instructing curricula that involve multiple levels of learning are challenged to maintain their focus on the social realities demonstrated in their online classrooms and on the ways in which they impact the integration of overall learning and the application of technologies.

## **Conclusion**

To participate in students' individual development as they actualize and integrate personalized meaning related to social justice and civic engagement in local communities is genuinely exciting. As study results indicate, helping participants to develop individual voices is, in fact, thrilling as they demonstrate evolving leadership skills that may result in positive social action in their local communities. Without the aid of technologies, such rich dialogue and experience would be limited to a regional analysis; through the use of media-based instruction, educational experiences extend a global reach, providing compounded meaning and impact (Merryfield, 2001). It is the intent of this article to contribute to the growing and substantial literature that addresses the potential for a global impact of intentionally constructed educational experiences focused on social justice education through the use of technology. Merryfield (2006) cautions,

“We can use electronic technologies to counter mainstream academic knowledge, overcome teachers’ parochialism and national chauvinism, and challenge White middle-class American assumptions about power, inequity, and privilege. Or, we can use these new technologies to justify the status quo” (p. 297). As she so aptly remarks, “The choice is ours” (2006, p. 297).

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## ***The Pedagogical Enhancement of Open Education: An Examination of Problem-Based Learning***

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### **Abstract**

Open education, as embodied in open educational resources (OER) and OpenCourseWare (OCW), has met and dealt with several key problems. The movement now has a critical mass of available content. Leveraging no small amount of funding and associated development, open education has the tools to collect, disseminate, and support the discovery of open materials. Now that the foundation for openness has been laid, practitioners are experimenting with new kinds of education and pedagogies associated with open content (Weller, 2009; di Savoia, 2009). Problem-based learning is one of many progressive pedagogies that might be combined with open education. This paper defines problem-based learning in the context of open education. Unique challenges are presented and discussed alongside possible solutions, realistic limitations, and calls for implementation in the future to test validity.

**Keywords:** Open education; problem-based learning; open educational resources; higher education

### **Introduction**

For various reasons, open educational resource (OER) archives are beginning to lose external support, including the OpenCourseWare initiative at Utah State University (Perry, 2009). This comes at a time when organizations like the OpenCourseWare Consortium (2009) are starting to charge educational institutions for membership. Now more than ever, OER is in a position of needing to find ways to defray costs (Downes, 2007) or to show value to the organizations that fund them.

One possible means of showing value is partnering OER with established, vetted, and well-researched approaches to teaching and learning. Scholars are beginning to push for an

examination of the underlying pedagogies of OER and are even calling for materials that are much more progressive in their orientation (Weller, 2009, di Savoia, 2009). OER is perhaps uniquely positioned for this kind of partnership. Whereas learning objects are criticized for being a technical or engineered solution to a fundamentally pedagogical problem (McGreal, 2004), OER is comparatively less about standards and more about the pedagogically neutral concept of openness. Although there are several pedagogical approaches that OER might be partnered with, this review provides an examination of problem-based learning (PBL). As a fundamentally progressive approach, PBL answers the call of Weller (2009) with a whole host of literature, a meta-synthesis (Strobel & Barneveld, 2009), and several meta-analyses (Walker & Leary, 2009). The purpose of this review is to examine problem-based learning open educational resources (PBL OERs) and to explore the potential for a mutually beneficial relationship between the two areas of inquiry.

Because a combination of PBL and OER is scarce in scholarly writing and in empirical work, searches in each area were conducted largely in parallel. For PBL, search terms included *problem based learning* and *problem-based learning*. For OER, search terms included *open educational resources* and *free educational resources*. Sources included ScienceDirect, Wiley Online Library, EBSCO, and PubMed. For references covering both areas of research, variations on PBL were combined with the terms *free*, *open*, or *resources*. Given the emergent nature of the work, and the combination of quantitative and qualitative studies included, a qualitative literature review (Ogawa & Malen, 1991) was conducted.

## **Problem-Based Learning**

PBL is a particularly good fit with OER. PBL has a reasonable amount of empirical research. It is progressive in its alignment, yet it needs to draw on a range of resources, including both expert-centric and those that are more egalitarian in nature. PBL is particularly efficacious with non-traditional student populations (Doucet, Purdy, Kaufman, & Langille, 1998) endemic to open education experiences. Arising in medical schools in the late 1960s, PBL is a learner-centered instructional approach (Barrows, 1996). PBL consists of student-centeredness, teachers acting as facilitators, small group learning, and beginning with problems that are ill structured and authentic (Barrows, 1986; 1996).

PBL has been widely adopted and applied in a variety of social science disciplines since its inception in medical education. Initial writing about PBL was coupled with ambitious aims for the development of domain or content knowledge structured for problem solving, as well as for problem-solving skills, for critical thinking and reasoning, for self-directed learning, and for increased motivation for lifelong learning (Barrows, 1986). According to the empirical research base, those aims have been largely met. When compared to lecture-based students on their general content knowledge alone, PBL students appeared to perform slightly worse initially (Albanese & Mitchell, 1993; Vernon & Blake, 1993), but subsequent research showed that they perform at about the same level (Dochy, Segers, Van den Bossche, & Gijbels, 2003; Gijbels, Dochy, Van den Bossche, & Segers, 2005; Walker & Leary, 2009). When assessments become more complex, asking students to explain the underlying relationships between concepts or to

apply their knowledge in the solution of novel problems, PBL students perform markedly better (Gijbels et al., 2005; Walker & Leary, 2009). PBL also results in better retention over time (Strobel & Barneveld, 2009) and has shown particularly positive results with adult learners (Doucet et al., 1998) and in disciplines outside of medical education, including teacher education, social sciences, and business (Walker & Leary, 2009). Overall, the learning outcomes of PBL are positive. PBL students have as much content knowledge as their lecture-based counterparts, perform better at more complex forms of assessment, and retain more of what they learn. In addition, the approach has proven robust in several different disciplines and with older students (Doucet et al., 1998), indicating that it may be efficacious and a good fit for OER. Although traditionally delivered in face-to-face settings, PBL has expanded recently to include distance learning, which may be better suited to the digital nature of OER.

Distributed problem-based learning (or dPBL) specifically refers to online implementations of PBL. With dPBL, learners around the world can work together and expand their problem-solving skills. Online learning environments provide PBL learners with opportunities to be involved in different stages of work as a group and to continue their collaboration on projects, despite physical separation, using communication technologies. Some dPBL studies use synchronous interventions, requiring simultaneous interaction by students (Sulaiman, Atan, Idrus, & Dzakiria, 2004). Others use asynchronous technologies, allowing students to take part in discussions over a period of days or weeks (An & Reigeluth, 2008; ChanLin & Chan, 2007; Kenny, Bullen, & Loftus, 2006; McConnell, 2002; Steinkuehler, Derry, Hmelo-Silver, & Delmarcelle, 2002; Stewart, MacIntyre, Galea, & Steel, 2007). Still others combine the two, with some synchronous elements and some asynchronous (An & Reigeluth, 2008; Dennis, 2003; Gale, Wheeler, & Kelly, 2007; Ronteltap & Eurelings, 2002; Waters & Johnston, 2004). The research findings for PBL are favorable: It is well suited for combination with OER, and emerging trends to deliver PBL at a distance are well positioned to take full advantage of the digital nature of OER.

## **The Combination of PBL and OER**

A quick search using the Folksemantic engine reveals over 20,000 resources related to PBL, suggesting some overlap between these two communities (<http://www.folksemantic.com/>). Additionally, Falagas, Karveli, and Panos (2007) suggest the use of free Internet resources for case studies, presumably including open educational resources. Kerfoot, Masser, and Hafler (2005) note the use of the repository PubMed, which includes works in the public domain.

Those looking for resources to support PBL design directly or to support students seeking information during a PBL implementation might look at Academic Earth (<http://academicearth.org>), Scientific Commons (<http://en.scientificcommons.org/>), or other specialty portals like Project OSCAR (<http://oscar.iitb.ac.in/>). The following is a discussion of the unique challenges and benefits of combining PBL and OER alongside relevant examples. Two PBL cases are discussed, neither of which is open. One teaches non-physics majors about basic forces through accident reconstruction (<http://www.udel.edu/pblc/samples/badday/>). The other is

an Earth science investigation of fire management in the Yellowstone National Forest (<http://www.cotf.edu/ete/modules/yellowstone/YFsituation.html>).

## **Benefit of Lowering Costs**

PBL stands to benefit directly from the inclusion of the shared resources possible with OER. Generally, faculty commits more time to interacting with students in PBL contexts than in traditional classroom settings (Berkson, 1993). This presents several difficulties for PBL. Faculty is generally expensive and does not scale to large numbers (Donner & Bickley, 1993). Irrespective of cost, faculty actually hampers PBL outcomes. Although the exact reasons are unknown, the use of peers as facilitators results in better learning outcomes than the use of faculty (Walker & Leary, 2009). Thus, PBL may improve as students go to outside resources in addition to faculty. For example, students in the forest fire case are encouraged to explore resources on Yellowstone Park and fire science (<http://www.cotf.edu/ete/modules/yellowstone/YFlinks.html>) that get at the underlying nature of the problem. Utilization of OER within PBL contexts might decrease the time that course instructors spend with learners, specifically the time that content experts spend answering direct student questions. This may further benefit the PBL process in that students will have less exposure to faculty who, uncomfortable with the PBL approach, turn discussion sessions into ad hoc lectures (Moust, de Grave, & Gijsselaers, 1990).

In any PBL context, learners are required to identify their learning needs and to collect resources or information regarding the assigned topic. For learners in a conventional PBL situation, information needs can be fulfilled by access to printed materials, such as journal articles, reference books, or textbooks. Yet access to such resources might be limited or costly for the institution providing them. Print-based materials are rivals in the sense that no two groups can access them simultaneously. Because print-based resources are even more problematic in online settings, with time required to mail resources, OER makes even more sense in dPBL contexts. Digital resources like OER may alleviate some of the demands on print-based collections. Although there are substantial upfront costs, the marginal cost of serving 10 or even 1,000 more students with OER approaches zero (Catone, 2009). While this is not a new concept for OER, it is a pronounced benefit in the context of PBL. As an example, an interactive Java applet (<http://www.udel.edu/pblc/samples/badday/>) visualizing motion and acceleration (or deceleration), found through Project OSCAR, might assist students with accident reconstruction. Another benefit of incorporating OER is the ability to respond directly to criticisms of PBL.

## **PBL Criticism**

According to Kirschner, Sweller, and Clark (2006), cognitive load may arise for students in minimally guided settings like PBL. Their argument is that strong guidance is necessary, especially for the learners who do not have enough background knowledge at the beginning of learning. In essence, this is about germane load. If learners are devoting a substantial portion of their mental capacity learning background material, they will have comparably less capacity for engaging in problem-solving and for learning the new material surrounding the problem at hand. Relevant background knowledge might be disseminated via OER. There are certainly risks with

this approach. Overly focused background knowledge may detract from the ability of students to engage in free inquiry (Barrows, 1986), essentially labeling the underlying issues of the problems by virtue of the associated background content. If resources are closely related to the problem at hand, this can be avoided. For example, in the physics problem (<http://www.udel.edu/pblc/samples/badday/>) all of the student resources deal with accident reconstruction, allowing free inquiry to proceed. Scaffolds may suffer from similar problems; in the Yellowstone scaffold (<http://www.cotf.edu/ete/modules/yellowstone/YFsituation1.html>), students are quickly made aware of a critical relationship between forest fires and the biosphere, lithosphere, atmosphere, and hydrosphere of the park. While the nature of that relationship remains for student discovery, the fact that the relationship exists does not.

## **Barriers to Open PBL**

The combination of PBL and OER presents other unique challenges. In order for the free inquiry process to be meaningful, it is important that the problem solution be unknown to students. Yet if a PBL course were made available as OpenCourseWare (OCW), then students as well as teachers would have access to it. In essence, this forces a dual course design with one course intended for student consumption and one supplement intended for teachers. There are several possible solutions, each presenting different challenges.

### **Close part of curriculum.**

The solution set could be made available freely upon request from a teacher. An example of curricula with closed teacher guides is the Problem-Based Learning for College Physics (<http://rea.ccdmd.qc.ca/en/pbl/>). The teacher guides for each project are password protected, but the portions meant for student consumption and use are freely, but not openly, available. There are two difficulties associated with this approach: The first is administrative overhead, including the necessity to vet an OCW user as a teacher, which in this case is done via email, and the second is blocking access to information, which is in ideological opposition to the goals of open education.

### **Encourage localization.**

Features of the problem could be altered to meet the needs of a specific class. Since this “remixing” for the class is one of the purposes of OER, it is a good fit with the intended goals of education (Gurell, 2008). The problem is a massive disincentive to make the modified version of the problem and associated materials equally open. Once open, students may be able to find the solution for their localized version of the problem. In essence, localization encourages teachers to share, but not to share alike. A shift in licensing to allow a period of closed use before providing full open access to teacher guides might be needed.



## **Leverage existing OER in support of PBL.**

In this approach, the PBL portion does not become OER; rather, it uses OER to help students fulfill their information needs in pursuit of a problem solution. Fitting traditional OCW/OER into a PBL curriculum may be awkward and inefficient. For example, students may need to watch a 50-minute lecture in order to gain three minutes of relevant information. The pedagogy built into the OER may be at odds with the PBL approach, a departure from the inquiry-based foundations that is stark enough to subvert the self-directed learning nature of PBL.

## **Structure the curriculum to have an instructor-provided solution.**

A PBL curriculum could be structured in such a way that the answer would be obvious to a domain expert (e.g., the instructor), but not to students. This method reduces the responsibility of repositories to manage the answers while providing authentic PBL instruction at the same time. As an example, the accident reconstruction problem eschews a provided solution to the problem (<http://www.udel.edu/pblc/samples/badday/solution.html>). Here the disadvantages are about existing research and cost. The expertise necessary for this approach, such as college faculty, is relatively expensive.

## **Sustainability**

Best practices surrounding the sustainability of OER as a whole are largely unknown, and the body of literature is only beginning to emerge. Stephen Downes, a noted scholar on open education, has suggested several funding models (2007). Some have already been implemented and evaluation efforts are ongoing. MIT OCW derives its funding from MIT, with some help from non-profit foundations (O’Liveira, n.d.). Brigham Young University has been experimenting with offering OCW courses for credit (Wiley, 2009a, 2009b). Results of that research indicate that the cost of converting existing online courses to OCW adds to paid enrollments, so much so that the effort is self-sustaining (Johansen, 2009). The costs of PBL tend to be much higher than traditional forms of instruction. For those willing to invest in PBL irrespective of openness, the utilization of OER represents a cost-saving mechanism from the beginning.

## **Conclusion**

Many of the technical and legal barriers to open education have been alleviated, and a critical mass of content has been achieved. Colleges and universities have a stake in quality teaching and learning, which may be advanced by coupling PBL with OER. Rarely can practitioners take advantage of such mutually beneficial situations. PBL does provide strong learning outcomes in certain disciplines (Walker & Leary, 2009) and with certain types of assessment (Gijbels et al., 2005). Depending on the discipline and assessments, OER creators could certainly bolster their case for funding by partnering their open course material with PBL. With that said, much work remains. Studies are needed to determine if PBL is equally efficacious with OER. It should be noted that Barrows (2002), in particular, was skeptical about whether or not tools existed to



support the interactions necessary for PBL fully at a distance. However, those comments were made well before many of the social software tools that are readily accessible now and would not apply to some of the face-to-face combinations of OER and PBL described above.

We want to emphasize our stance that PBL is not a single solution to every educational need. If the focus is on memorizing facts, for instance, PBL may take longer and may cost more (Donner & Bickley, 1993) to arrive at similar learning outcomes when compared to the traditional lecture. Nor is PBL the only approach that might be meaningfully combined with OER. Future research should explore not only the efficacy of PBL and OER but also the union of PBL with other well-researched approaches to teaching and learning. Although licensing is still a critical concern, OER needs to start devoting equal effort to the underlying pedagogy of open materials.

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## ***Using Collaborative Course Development to Achieve Online Course Quality Standards***

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### **Abstract**

The issue of quality is becoming front and centre as online and distance education moves into the mainstream of higher education. Many believe collaborative course development is the best way to design quality online courses. This research uses a case study approach to probe into the collaborative course development process and the implementation of quality standards at a Canadian university. Four cases are presented to discuss the effects of the faculty member/instructional designer relationship on course quality, as well as the issues surrounding the use of quality standards as a development tool. Findings from the study indicate that the extent of collaboration depends on the degree of course development and revision required, the nature of the established relationship between the faculty member and designer, and the level of experience of the faculty member. Recommendations for the effective use of quality standards using collaborative development processes are provided.

**Keywords:** Course development; course development team; online course quality; quality standards; instructional design standards; distance education; online learning; online education

### **Introduction**

The issue of quality is becoming front and centre as online and distance education moves into the mainstream of higher education (Sloan Consortium, 2004). Recent studies have determined that regarding students' academic performance, online learning can be as effective as face-to-face learning and, in some cases, more effective (Sachar & Neumann, 2010; Tsai, 2009; U.S. Department of Education, 2009). Despite these promising and illuminating findings, universities and colleges that offer online programs must reassure various stakeholders, including learners, that engaging in online studies will be an effective and rewarding learning experience and that they will acquire the necessary skills and knowledge a particular program promises to deliver. To help provide these reassurances to stakeholders, many institutions and regional bodies have developed or adopted quality-related principles or standards that serve to define quality, but the

debate remains on how to best assess quality when the new forms of education are emerging and changing rapidly (Middlehurst, 2001).

Royal Roads University (RRU) is one such institution offering applied and professional programs that feature substantive online study. Combining face-to-face residencies of one to four weeks with online courses in a cohort model, RRU's programs have attracted many learners who appreciate the flexibility of a mixed model of delivery, especially if they are continuing to work full-time while taking a degree or certificate program. With over 600 courses being developed or revised annually, Royal Roads University needs to use a systematic approach to course development. All faculty members, including contract instructors, are supported by instructional designers in a centrally operated unit called the Centre for Teaching and Educational Technologies (CTET). This means each course must be designed and developed under the guidance of an academic lead and an instructional designer to ensure alignment with program outcomes and the university-wide instructional design quality standards, compiled and published by CTET in 2004 (Chao, Saj, & Tessier, 2004; see Appendix A). These standards consist of criteria related to learning outcomes and instructional strategies.

The instructional design quality standards have served primarily as a formative tool, with the use of the standards varying from one instructional designer to another. In addition, since the release of the quality standards, the University has formalized its curriculum and course quality assurance process by creating a university-wide, peer-based curriculum review and approval process, administered by the Curriculum Committee. As a result, it became necessary for CTET's instructional design process to be aligned with this new process. A close examination of the course development process with the use of the instructional design quality standards is crucial in mapping a path forward to enhance the design and development of high-quality courses.

## **Literature Review**

In most conventional higher education institutions, course design and development is accomplished by individual instructors. They draw up their course outlines based on their knowledge of a subject, without significant assistance from other university staff members. Thus, overall, the process of developing courses in higher education is a solitary one without consultation. The emergence of distance and online learning has contributed to a change in this process. A shared process of course development, referred to by Daniel (2009) as an industrial model of labour division for course development, has emerged in many higher education institutions. Instructional designers and technical personnel take part in the design and development of courses while instructors provide the subject matter expertise.

Instructional designers in CTET, like many practitioners in the field, advocate a collaborative course development model for quality online learning (Kidney, Cummings, & Boehm, 2007; Oblinger & Hawkins, 2006; Wang, Gould, & King, 2009). The main argument for adopting a collaborative development model is that designing a high-quality online course requires various sources of expertise not usually possessed by one person. Quite often, the development of an online course takes longer than the development of its face-to-face equivalent and requires the

rethinking of pedagogy (Caplan, 2008; Knowles & Kalata, 2007). Proponents of distance and online education argue that the “lone ranger” model, in which an instructor learns how to design and teach an online course by him or herself, is not scalable and does not lend itself to the diffusion of innovative practice in an organization (Bates, 2000, p. 2). The days of the star faculty member who can do it all are long gone. Staff with instructional design expertise, technical knowledge, and subject matter knowledge must collaborate to produce quality courses on a consistent basis (Oblinger & Hawkins, 2006).

Researchers have begun to investigate the relationship between course development and course quality. The Institute for Higher Education Policy identified seven categories of quality measures: institutional support, course development, teaching and learning, course structure, student support, faculty support, and evaluation and assessment. Under the course development category, an institution should establish minimum standards and continuous reviews to ensure quality (Merisotis & Phipps, 2000). A similar effort was made in Canada with the publication of the *Canadian Recommended E-learning Guidelines*. These guidelines defined quality outcomes with a strong emphasis on learner-centred curricula and customer-oriented services. They did not suggest a development model to achieve those outcomes but did imply the importance of routine review and evaluation of course content, design, teaching, student achievements, policies and management practices, and learner support (Barker, 2002). The Sloan Consortium’s framework also proposes five pillars of quality: learning effectiveness, cost effectiveness, access, faculty satisfaction, and student satisfaction. Again, among a myriad of measures, the Sloan-C framework proposes a collaborative approach to curriculum design. It states that “effective design involves resources inside and outside of the institution, engaging the perspectives of many constituents... [and] aiming to use the experience of learners, teachers, and designers” (Moore, 2002, p. 17).

Many higher-education institutions now have instructional designers at the centre of curriculum design and development activities. Instructional design as a discipline came from skill-based training in the military during World War II (Reiser, 2001). Generally, instructional design practice did not have a significant presence on university campuses until the late 1980s and early 1990s when Internet technology and the resulting advances in online learning models and practices became prevalent. This enhanced presence did not necessarily equate with success. The common practice of systematic design, such as the ADDIE model, simply did not fit well with the academic culture (Moore & Kearsley, 2004; Magnussen, 2005). Over the past two decades, instructional designers in higher education have needed to redefine their role and practice. The role of a change agent emerged as instructional designers worked side by side with faculty to rethink their teaching in order to integrate technology into course design and delivery (Campbell, Schwier, & Kenny, 2007). Not only do instructional designers play the role of advisers to faculty and department on issues of curriculum and course quality, they also play a vital role in faculty development and institutional change when it comes to researching and implementing new learning technologies. Undoubtedly, instructional designers in higher education need to modify their approach and design models to fulfill their widening role and to make meaningful contributions. New design prototypes have evolved through field experience in higher education



(Power, 2009), and role-based design has been proposed to transform the field of instructional design (Hokanson, Miller, & Hooper, 2008).

In summary, the literature cited reveals several important trends in course development. First, quality standards are receiving more attention as online education moves into the mainstream. Increasingly, universities and colleges are using standards to define quality. Second, instructional design is undergoing a transformation with the designer's role changing to fit the shifting needs of higher education; designers are (and could be) viewed as change agents. Team-based collaborative course development is highly regarded in the field. However, collaborative course development with the use of quality standards is in need of close examination in terms of its effectiveness and applicability in the large-scale production required by online learning institutions, such as Royal Roads University. As Liston (1999) pointed out, building an effective quality culture requires, in part, prudent management of key processes.

This research investigates the course development process through the analysis of several case studies; as well, it explores the implications of collaboration on the enhancement of online course quality.

## **Research Questions**

The study had three purposes: (1) determining how quality standards can be effectively used and implemented by faculty and instructional designers; (2) determining what kinds of collaborative processes involving faculty and instructional design staff best support the implementation of quality review processes; and (3) ascertaining how to make the development process as effective as possible by examining both the important elements of course quality and the key elements of collaboration.

Key questions in the research process are presented below:

### (1) Elements of quality

- What are the important aspects of course quality? What criteria were valued highly by course developers?
- Were the quality guidelines helpful? Did they play a role in strengthening course quality? How?

### (2) Elements of productive collaboration in course development

- What factors related to collaboration helped the development of a quality course?
- What factors related to collaboration hindered the development of a quality course?

### (3) Optimal development process

- How can we improve the process and make best use of the resources to ensure that courses meet the quality standards?

## **Research Method**

The research used a case study approach to examine how quality standards can be effectively implemented with a collaborative course development strategy. The case study is well established as a qualitative research method in the social sciences (Bromley, 1977). In each of the four cases selected for the study, an instructional designer worked with a faculty member to create and implement a collaborative process for using the quality standards to design and review an online course.

The four cases were selected, through purposive sampling, from different program areas to increase the breadth of the inquiry. This sampling process ensured that a diversity of courses, both new and those in revision, were examined. The faculty member's level of experience with online courses was also taken into consideration during the sampling process. The small sample size also allowed an in-depth look into the course development process and the working relationship a faculty member forged with an instructional designer. All courses were offered within three months of one another and were of the same duration with a similar amount of content.

The four cases are listed below:

- Course A is a new course in an existing undergraduate program. A set of new learning outcomes had to be constructed to fit with the program's overall outcomes. The faculty member has been teaching in the program since its inception. The faculty member and the instructional designer had worked well together prior to developing this course. This course required Curriculum Committee approval to proceed.<sup>1</sup>
- Course B is part of an existing undergraduate program. It required a major revision. The faculty member and the instructional designer had worked briefly together prior to developing this course. The faculty member was the original creator of the course and has taught it since the beginning. Because the course content was over three years old, the faculty member felt the time had come to overhaul it. While the revision adhered to the same learning outcomes, several content and learning activities were changed. This course required Curriculum Committee approval to proceed.
- Course C is a graduate-level course. It required minor revisions. The faculty member and the instructional designer knew each other well. The instructor designed the course and has taught it for many years. The revisions consisted of small changes to improve the learning activities.
- Course D is a graduate-level course. It required minor revisions. The course was developed by another faculty member, and the faculty member in our study was asked to teach it with minor tweaks. The faculty member and the instructional designer did not

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<sup>1</sup> All new courses or programs and all "major revision" courses (a change to at least 40% of the content of the course) must be approved by the Curriculum Committee in order to be offered to Royal Roads learners. Two of the four cases in this research project required Curriculum Committee approval to proceed (Courses A & B). Therefore, an added dimension of the course development process for the instructor and instructional designer of those courses was to keep the requirements of Curriculum Committee approval in mind while developing the course.

know each other and were working on this course for the first time. Also, the faculty member was new to online teaching and the instructional designer was new to the university.

Both Yin (1984) and Stake (1995; 1998) argue that the use of multiple data-gathering strategies enhances the richness of the case analysis and increases the credibility of the reporting. Therefore, multiple data-gathering strategies in this study include document analysis, a survey, and semi-structured interviews. These three data-gathering strategies are described briefly below:

1. The quality standards were converted into a guidelines checklist, which enabled the tracking of the standards as they pertain to specific courses. Participants were asked to use the guidelines checklist to review the course as it was being developed and to note any comments that might be helpful to the research team.
2. A short survey was used to gather feedback from the faculty members and instructional designers regarding specific improvements to the quality standards after using them to design an online course. Once the course was launched, each team of faculty members and instructional designers was sent a copy of the “About the Guidelines” survey and asked to complete it. Questions for this survey are found in Appendix B.
3. Semi-structured group interviews were conducted with the faculty member and instructional designer who were working together to develop courses using the quality review criteria. The purpose of the interviews was to determine the strengths, limitations, and lessons learned in using the quality standards in a collaborative way. Questions for the interviews are found in Appendix C.

All interview transcripts and survey results were subjected to a thematic analysis of their content by the research team. Then these analyses were compared and re-examined until a common set of themes had been determined and agreed upon. These themes were used to code data from the transcripts using an inductive analytical approach as described by Huberman, Miles, and Lincoln (1994) and Mason (1996). As a form of interpretive research, the study placed emphasis on exploring the subjective and inter-subjective meanings that participants articulated as they reflected on their involvement in the course development process (Guba & Lincoln, 1994).

## **Research Findings**

The research findings integrate the data gathered through the interviews and the open-ended survey responses.

### **Important Aspects of Course Quality**

It was clear that each faculty member and instructional designer focused on different quality standards as they took notes during the development. Interviews frequently referenced discussions that took place about what constitutes a quality course. Both the faculty members and the instructional designers felt that certain standards demanded more attention than others. For example, criteria related to learning outcomes and assessments were viewed as quite important.

One faculty member said, “There are some guidelines that lend themselves well to the very early conceptualization of the course and the overall design.”

However, an assessment of the value of specific guidelines varied among the development teams. Some teams thought criteria related to learning outcomes were important while others thought criteria related to student workload and learning styles were important as those details tended to be overlooked in the course development process.

## **Helpfulness of the Quality Guidelines**

All participants indicated in the survey and in the interviews that the quality guidelines were helpful.

However, one instructional designer and one faculty member felt that using the guidelines at the start of the development process did not make much difference in the quality outcome of the course. All participants agreed that the guidelines were helpful at the end of the process as a checklist: “I used [the guidelines] when I first received them, starting the development, and then I used them again when I was finishing up [the last details].”

Some participants also stressed that the guidelines were only helpful if they could be adapted based on the needs of the course, of the instructional designer, and of the faculty member, and that they could not be used in isolation. One designer stated, “I would not recommend using [the guidelines] without a discussion of how they apply to each specific course.”

A faculty member wrote, “Guidelines can’t be separated from the conversations that occur with the instructional designer – they won’t be effective on their own.”

Even though the guidelines were used in different ways in the four cases, several participants commented that the guidelines provided an objective, outside perspective on what was important in the course development process and helped to expand their overall development toolkit.

On a university-wide level, the findings provided some interesting insights into how course development relates to other entities within the university. In particular, the participants indicated that the guidelines helped them to better prepare for the Curriculum Committee review process:

...in my previous experience with [the] Curriculum Committee, instructors go into it by themselves, never quite sure what to include or leave out [in their curriculum submissions]. With [these guidelines], they’d get far more guidance and help to produce something valuable.

The guidelines also served to provide an institutional definition of course quality for faculty and for learners. The following comment illustrates such a viewpoint: “Sometimes instructors, I think,

don't realize what goes on behind the scenes, [that] what they are doing is part of a larger process...this reminded me of that.”

The survey data and interviews suggested that the participants' views on the usefulness of quality guidelines depended on their level of experience. For a relatively new faculty member, the guidelines served as an orientation and helped to clarify how to create a successful course. The instructional designer who was relatively new to Royal Roads commented that the guidelines helped to establish consistency in the development process.

One experienced faculty member indicated that the guidelines complemented existing training and experience and were a positive reinforcement of faculty members' pre-existing competency. Faculty also characterized the guidelines as a “reminder,” a “reference,” and a “checklist.” The guidelines were used as a validation step to gauge the robustness of the instructional design qualities of the course, which provided the faculty member with more confidence that he or she was “doing the right things” while helping to ensure that he or she “didn't miss anything.” One faculty member said that it helped to “refresh my memory.” In other words, the guidelines were seen as a positive and empowering tool in the course development process, highlighting how much the faculty member and the instructional designer already knew.

A couple of responses touched on the time pressures that faculty members face during the course development process, indicating that the guidelines were more helpful when not dealing with short timelines and acute time pressures, leading to speculation that the use of the specific standards would need to be prioritized or used selectively.

## **Factors that Facilitate Collaboration**

Having rapport is a crucial factor in collaboration. This means that the instructional designer and the faculty member are familiar with each other's working styles. For the instructional designer, the rapport comes from her familiarity with the course content and the faculty member's teaching philosophy. One instructional designer said, “We've known each other for a long time so we [have] already established that rapport working together.”

Another commented, “...it comes down to building relationships, having the time, having that strong foundation.”

A faculty member further commented:

... [the instructional designer] knew the program very well... it didn't take me too long to explain... with a certain understanding with content, because she knew exactly what the structure and the overall structure of the process and the overall rationale of the program. It helps a great deal.

It seems easier to take a collaborative approach to course design when the relationship between the instructional designer and faculty member has already been established. This relationship may be strengthened at the personal level when the pair has known each other for a long time and has a history of successful collaboration.

Without the history of working together, however, the faculty member and the instructional designer appear to become a productive team if they have enough time to establish expectations up front and if they allow themselves to move at a pace that gives them room to listen to feedback and to reflect. Collaboration was fostered by what an instructional designer called “early conversations.” She commented, “The first conversation was really all-encompassing; I think it’s not just the design, but it’s the goal and how we approach this and the underlying teaching philosophy.”

Another instructional designer described the exchange she had with an instructor during their first meeting for their first course project together:

[the instructor] has some strong feelings [about] participation marks. So after hearing him talk about it, I could see his point and see his reasoning, and I think my biggest advice to you was to make it clear up front what you think and why you think that.

These conversations, whether face-to-face, by phone, or by email, created a sense of team solidarity because they helped create a shared understanding and vision. Also, having an upfront discussion about vision and goals for a course helped to set the stage for further discussions related to the elements of course quality. One instructional designer said,

[there is] value in actually having that first conversation to get a better understanding of what your objectives are in terms of revisions, what you want to see out of the course, and how you want to improve the experience.

Using the guidelines facilitated a team approach to course revision. For the faculty members, this was a positive experience because it seemed as though there was shared responsibility among various people for enhancing the course (e.g., faculty members themselves, instructional designers, web developers, even the Curriculum Committee). But one faculty member did comment that he felt “vulnerable” having so many eyes looking in on his course, that he had to get used to this team approach, but that he came to appreciate it by the end. There is no doubt that a faculty member’s willingness to be open to feedback is very important in the collaborative process as well as an instructional designer’s investment in building rapport and in understanding an individual faculty member’s teaching approach.

## **Factors that Hindered Collaboration**

Several factors related to collaboration could hinder the development of a quality course. Participants seemed to agree that introducing all the guidelines at once could be overwhelming, especially when the development timeframe is short.

For example, in one case, the instructional designer used the guidelines as a template to provide feedback. The faculty member reported feeling overwhelmed by the amount of detailed comments beside many of the criteria and thought all comments needed to be addressed before the course went to the Curriculum Committee. Further discussion with the instructional designer revealed that this was not the case, leading the faculty member to feel that using the guidelines in this way confused matters.

It became apparent to faculty members and instructional designers that different criteria were important at different stages of the course development. Also, faculty members and instructional designers felt that they should have the freedom to adapt the guidelines to their level of experience and to the circumstances of the course development project. According to the study participants, early and clear communication about how the guidelines were going to be used was also important. One instructional designer said that the danger of unclear expectations and of overload of information risked damaging a positive working relationship.

Everyone seemed to view collaboration as a positive experience and a necessary step in producing quality courses. However, it is a double-edged sword, as one instructional designer indicated:

The downside is it's labour intensive... But... we got a much better outcome, and that much better outcome saves us a lot of time down the road. Because we'll be better received by learners, it'll be a much better experience for them...So if you look at the whole picture, I think it's better.

Participants' responses indicated that collaboration is viewed as time consuming, but if the team can focus on shared meaning and vision early enough, as well as on a productive working relationship, it can reduce the amount of time and work spent fixing problems later, the kind that, if they arise, can compromise the quality of a course.

Overall, the participants felt that it wasn't necessary to introduce the guidelines in a formal and artificial way when their collaborative work "naturally flowed." They used parts of the guidelines when they needed to and in a way that suited their workflow.

## **Optimal Development Process**

In addition to the faculty member's level of experience, the nature of the course development project affected the way the instructional designer and faculty member worked together. In the



cases of a new course or major revision, collaboration played an important role, requiring relationship building and visioning to create synergy in the team. If the course required a minor revision, the nature of the collaboration became task-oriented, rather than based on building a vision and relationship. One instructional designer commented on the importance of collaboration when developing a new course:

...it's more effective and it really helps the course quality if the guideline is used in conjunction with a very collaborative approach. And that's why I find it takes that initial discussion, the overarching discussion we have about teaching design because [the guidelines document] is an additional tool, on top of a very strong collaboration approach, just brings so much more value and will no doubt produce much better course quality.

In contrast, the instructional designer who worked on a minor revision said:

I don't know that we did a lot of collaboration. I mean, we did updates based on past experience of the course. I reviewed the course... We're not finished as well because we'll look to the web developer coming in and looking over images. I think there's going to be more opportunities to look at the course again... What [the faculty member] intends with the images ...we didn't have those conversations about the course.

There is no doubt that faculty members and instructional designers have different levels of experience and different working styles. Each course project has unique characteristics. All of these factors influence the collaborative process.

Furthermore, there was strong agreement among the participants that the quality standards need to be used flexibly in different course development situations to accommodate unique course development needs, individual teaching styles, and differing program contexts. As well, participants referred to the need for an "evolving" use of the standards during the course development process, which would allow them to make the different standards as meaningful as possible when they were most relevant in the course development process.

## **Conclusion**

From the interview and survey results reported, it is evident that the instructional design quality guidelines were valued by faculty members and instructional designers as being informative in the course development process. The degree of helpfulness of the guidelines, however, appears to be influenced by the experience level of the faculty member involved. There was strong agreement among participants that the guidelines are more helpful for new and less-experienced faculty members. In all four cases, however, the participants indicated that they valued the guidelines as part of the overall review process before the course was launched. As a whole,



participants placed the most value on the guidelines related to outcomes and assessment, although this perspective varied among the four development teams.

The four cases revealed different patterns of collaboration between the faculty member and the instructional designer. Establishing rapport early in the course development process was important and was made easier when a strong relationship had been established between the faculty member and instructional designer. Having sufficient time, or creating opportunities to dedicate time, for the mutual and respectful exchange of expectations/reflections about the course early in the development process was important in developing a shared understanding of what revisions were required and how the development process was to proceed.

All participants viewed the collaboration between the faculty member and the instructional designer to be a positive experience. Nevertheless, participants were able to cite factors related to the collaboration that hindered or potentially hindered producing a course that met the quality standards. Addressing all of the quality standards at the same time appeared to be overwhelming to faculty members and, therefore, limited the usefulness of the guidelines as both a course development tool and as a checklist on course quality. The responses of participants indicated that, based on their collective experience, the standards should be viewed as a set of guidelines that are flexibly and systematically introduced, along with a discussion of how to make the best use of them throughout the course development process. How the guidelines are used should depend on the nature of the course, the working relationship between the instructor and instructional designers, and the experience level of the instructor.

The study has a limitation, however. This research examined the relationship between faculty members and instructional designers in the four case studies but did not take into account the perspectives of other personnel who might have played important roles in the course development process, such as the program head and web developer.

Despite this limitation, a distinction between two types of specific uses of the quality guidelines has clearly emerged. Understanding these uses among the four cases sheds light on the degree and nature of the collaborative relationship that is most helpful in improving the course development process. Figure 1 illustrates the type of course development in relation to the implementation of the standards (i.e., guidelines used as a checklist vs. guidelines used as a development tool) and the nature of the collaborative relationship between the faculty member and the instructional designer (task-oriented vs. synergistic relationship).

## Use of ID Quality Guidelines

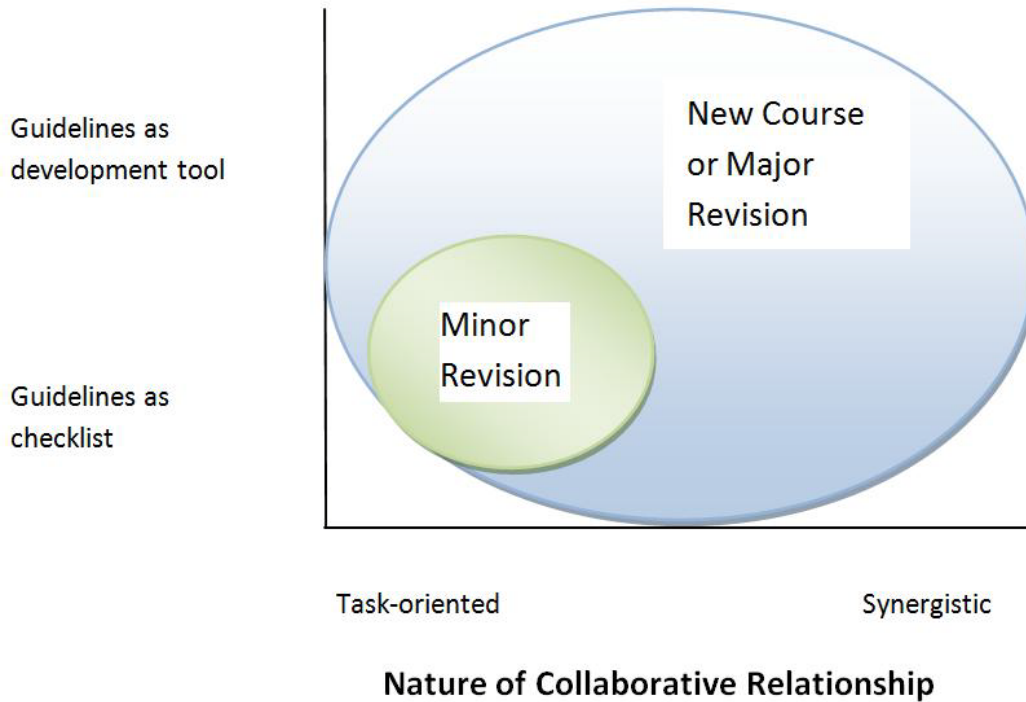


Figure 1. Different types of course development projects in relation to the use of quality guidelines and the nature of collaborative relationship.

In cases B, C, and D, where the courses had been designed and taught before, the team used the guidelines as a checklist. The faculty member and the instructional designer took a task-oriented approach. There was not as much time invested in discussing high-level design questions, nor was there much time dedicated to developing the relationship between the two team members. In addition, when an instructional designer and a faculty member already have a strong rapport, the revision is quite efficient as the team shares an understanding of the course's pedagogy and each other's working styles. On the other hand, in new courses or courses requiring extensive revisions, such as Course A in the study, faculty members and instructional designers were willing to invest time and effort in relationship-building activities that helped the team members develop a common vision for the course. Thus, the instructional design standards were a development tool used to set expectations, guide teamwork, and create opportunities for dialogue about the expectations for the course.

Taking all the findings together, there seems to be a need to better define the scope of course development required in individual courses and the level of collaboration necessary to produce a high-quality course. It is clear that the need for an elaborate collaboration process is the greatest when a new course is being developed. Therefore, new courses may benefit from a highly collaborative process, more so than courses requiring less extensive development or re-development. The cases suggest that a collaborative development process that integrates the use

of quality standards throughout the process would produce quality courses, primarily when the development work is complex and extensive. Such an approach has an added value of maintaining consistent quality at the institutional level, orienting new faculty members and instructional designers, and rejuvenating course development teams as the guidelines remind them of what is important in a quality course.

The cases also revealed a distinction between the extent of collaboration required to effectively support new course development and the extent required to support revision-based course development. Thus, it would be useful to seek a better way of judging a course development project from the onset so that different and more efficient processes could be implemented while ensuring that the quality standards are met.

Finding an optimal development process and a clear distinction between new course development and revision-based development has implications for an efficient, large-scale course development operation at an educational institution with extensive online course offerings, such as Royal Roads University. In the Sloan Consortium's quality framework, cost-effectiveness is a pillar equal to all other measures (Sloan Consortium, 2004). It implies that quality is a value determined by the ratio of benefits and cost. In other words, are the resources devoted to the elaborate collaboration justified in terms of producing the highest quality? Do all courses, regardless of the development scope, require a highly collaborative process? These remain crucial yet unanswered questions, even though the consensus in the field is to use collaborative approaches and to utilize the skills of instructional designers, web developers, graphic designers, and other IT personnel on a development team (Caplan, 2008; Knowles & Kalata, 2007).

Finally, our findings and conclusions from the four cases warrant the following recommendations, which course development teams may wish to consider in using quality standards effectively:

1. Ensure that the specific use of the guidelines is matched to the particular needs of the course development/revision process, i.e., for new courses, the guidelines can be used to facilitate the development process from the ground up to enhance quality; for revisions, they may serve as a checklist to maintain course quality.
2. Systematically plan for the additional effort and time involved in new course development and major course revisions in order to use the guidelines in a collaborative manner.
3. Use guidelines flexibly as a "guide," not as a template. Their use should depend on (a) the specific nature of the course development or revision process, (b) the level of experience of members of the course development team, and (c) the nature of the pre-existing relationship between members of this team.
4. Use guidelines to assist in developing shared understandings and expectations for the design of the course.
5. Use guidelines to help the development team focus on priorities for the development/revision process.

6. Raise awareness university-wide that guidelines are available for course development teams to use in a flexible way to support and enhance course quality.

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## Appendix A

### Royal Roads University Course Quality Standards

Standards	Comment
1. Course learning outcomes/competencies are aligned with and assessed against the program's outcomes/competencies.	
2. (Authentic / active) learning activities and assignments are aligned with the stated learning outcomes.	
3. Selected readings and resources reflect and fit the subject and course learning outcomes.	
4. Activities Schedule (or Calendar) identifies all course activities and due dates to guide learning.	
5. The number of readings, activities, and assignments is appropriate for effective learning (i.e., avoid information overload).	
6. Instruction (text) is written clearly and presented properly for effective learning. Design elements include: a. meaningful chunking b. meaningful placement c. easy and logical navigation d. on-screen reading vs. printing e. consistent use of headings	
7. Multiple learning styles are accommodated in the design and delivery of the course.	
8. Use visuals, multimedia, or other learning tools such as glossary, quiz, poll, etc. to engage learners.	
9. Instructional strategies for building community are used; for example, peer interaction and collaboration is planned and facilitated.	
10. Expectation regarding instructor presence and learner participation is clearly communicated.	



## Appendix B

### Survey Questions

Please use the rating of 1 to 5 for the following statements, 1 being **Strongly Disagree**, 2 being **Disagree**, 3 being **Neutral**, 4 being **Agree**, and 5 being **Strongly Agree**.

1. The quality guidelines are comprehensive.	1	2	3	4	5
2. Having the quality guidelines at the start of the course development process made a difference in the outcome of the design.	1	2	3	4	5
3. The interim assessment using the quality guidelines is helpful.	1	2	3	4	5
4. The final assessment using the quality guidelines is helpful.	1	2	3	4	5
5. Using the quality guidelines during the course development improves course quality.	1	2	3	4	5

6. Please add your comments or suggestions to the use of the quality guidelines and the collaborative development process (i.e., working with an instructional designer, web developer, and the quality check staff).
7. Do you think you will use the guidelines for future course developments? Why or why not?

## Appendix C

### Interview Questions

1. We had a look at your course and have a general idea about the content. Imagine we are the learners new to this course; could you please briefly describe your course and your approach to teaching?
2. Could you describe how you (referring to the instructor and the instructional designer) use the guidelines, for example, at which point during the revision did you use the guidelines, and did you discuss them to make decisions on revisions?
3. How would you describe your experience with the guidelines and new process, compared with your past experience designing courses at RRU?
4. What part of the guidelines did you find most useful when designing and developing/updating a course?
5. What part of the guidelines did you find least useful when designing and developing/updating a course?
6. Do you think using the guidelines helped improve course quality? Please explain how (or why not).
7. Do you feel you collaborated during the development of the course? Please explain and give examples of the collaborative tasks you have done.
8. Did you think the development process should have been more collaborative or less collaborative? Why?
9. From your experience in this project, what helped you to use the guidelines? What were the barriers in using the guidelines?
10. How would you recommend the guidelines be used if this project is expanded to all your colleagues? What are the potential barriers if we expand this project to all courses?





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# ***Online Instructional Effort Measured through the Lens of Teaching Presence in the Community of Inquiry Framework: A Re-Examination of Measures and Approach***

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## **Abstract**

With more than 4 million students enrolled in online courses in the US alone (Allen & Seaman, 2010), it is now time to inquire into the nature of instructional effort in online environments. Reflecting the community of inquiry (CoI) framework (Garrison, Anderson, & Archer, 2000) this paper addresses the following questions: How has instructor teaching presence (Anderson, Rourke, Garrison, & Archer, 2001) traditionally been viewed by researchers? What does productive instructor effort look like in an entire course, not just the main threaded discussion? Results suggest that conventional research approaches, based on quantitative content analysis, fail to account for the majority of teaching presence behaviors and thus may significantly under represent productive online instructional effort.

**Keywords:** Teaching presence; community of inquiry; higher education; content analysis

## **Purpose**

Online learning in higher education continues to grow at a rapid rate. The Department of Education reports that online students generated more than 12 million course enrollments in 2007-2008 (Parsad & Lewis, 2008) with more than one in four of all college students enrolled in at least one online course (Allen & Seaman, 2010). It is clear that adequate preparation of instructors who venture into this new mode of teaching and learning is vital to its successful implementation. Given that today's growth in distance higher education continues to be driven largely by developments in asynchronous online learning (Allen & Seaman, 2008; Parsad & Lewis, 2008; U.S. Department of Education, National Center for Education Statistics, 2008) it is

necessary that we focus our attention on models that represent the full range of instructional design, pedagogical, and managerial roles, i.e. activities that encompass the work of the online instructor in predominantly asynchronous environments.

Recent meta-analytic and traditional reviews of research indicate that the learning outcomes for online students are at least equivalent (Bernard, Abrami, Lou, Borokhovski, Wade, Wozney, Wallet, et al., 2004; Allen, Bourhis, Burrell, & Mabry, 2002; Tallent-Runnels, Thomas, Lan, Cooper, Ahern, Shaw, et. al., 2006; Zhao, Lei, Yan, Lai, & Tan, 2005) and may be superior to (Means, Toyama, Murphy, Bakia & Jones, 2009) those of classroom students. Means et al. (2009) concluded that the superior performance of online students may be a function of time on task (p. 51). It is clear that the transformation of classroom instruction to online instruction is a time-intensive process for faculty with frequent reports that online teaching requires more time (Dahl, 2003; Dziuban, Shea, & Arbaugh, 2005; Hislop, 2001; Tallent-Runnels et al. 2006) than comparable classroom instruction. One goal of this paper is to understand the nature of this instructional effort as evidenced in full online courses through the conceptual lens of *teaching presence* (Anderson et al., 2001).

This paper attempts to address the following overarching questions: How has instructor teaching presence traditionally been viewed by researchers? What does productive instructor effort look like in an entire course (not just the main threaded discussion)? How does evaluating instructor teaching presence at a course-level change the way this construct has been traditionally described? What additional behaviors do instructors exhibit that have not been captured by the existing model of teaching presence? Toward this end, we re-examine the widely referenced community of inquiry model (Garrison et al., 2000) with the purpose of enhancing the conceptual representativeness of the teaching presence construct. We set out to achieve this through an analysis of teaching presence behaviors occurring both within and outside the main threaded discussion area of online courses.

## **Theoretical Framework / Perspective**

The CoI framework developed by Garrison et al. (2000) is based on a model of critical thinking and practical inquiry. The authors posit that learning occurs through the interaction of students and their instructor and is manifest as three highly integrated elements that contribute to a successful online learning community: social presence (SP), teaching presence (TP), and cognitive presence (CP).

The focus of this paper is teaching presence, which has been defined as “the design, facilitation and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile outcomes” (Garrison et al., 2000). Others have also described it as the “binding element in creating a community of inquiry” (Garrison, et al., 2000, p. 96) and as the source of “online instructional orchestration” (Shea et al., 2010, p. 17). Using quantitative content analysis of postings in asynchronous discussion forums, Anderson, Rourke, Garrison, & Archer (2001) identified three categories and related indicators: instructional design and organization (DE), the facilitation of productive discourse (FD), and direct instruction (DI) (2001). It is

through the use of these indicators that researchers attempt to measure “how present the instructor is in the virtual classroom” (Benbunan-Fich, Hiltz, & Harasim, 2005, p. 27).

Instructor teaching presence is hypothesized to be an indicator of online instructional quality. Empirical research has supported this view with evidence indicating strong correlations between the quality of teaching presence and student satisfaction and learning (Bangert, 2008; Picciano, 2002; Shea, Pickett, & Pelz, 2003). We suggest that using teaching presence to measure instructional effort therefore has the advantage of measuring conceptually productive instructional activity rather than atheoretical indicators, such as overall numbers of posts (e.g., Davidson-Shivers, 2009) or hours spent online (e.g., Lazarus, 2003).

We argue that research on the teaching presence construct has been constrained by the following four limitations. First, there is a need to revisit two of the original three teaching presence elements. Although teaching presence as it was first delineated by Anderson et al. (2001) encompassed three dimensions, DE, FD and DI described above, factor analysis by Shea, Li, and Pickett (2006) found that the three elements failed to cohere as three separate constructs. Instead only two factors were identified: instructional design and organization and directed facilitation, the latter a revised category incorporating elements of both FD and DI. In this research, with several thousand students, analysis of survey responses suggested that students could not distinguish direct instruction, as defined in the CoI framework, as a construct distinct from facilitation of discourse.

The second limitation relates to design and organization (DE). This indicator was originally described as encompassing course structure, group and individual activities, timelines, and expectations (Anderson et al., 2001). Although the authors indicated that a majority of design takes place prior to the beginning of the course, we posit that the second component, “organization,” refers to an insufficiently documented but robust category of instructor tasks that are centered around “organizational, procedural, administrative tasks” and “procedural and decision-making norms” (Berge, 1995) Comparable instructor responsibilities have been identified by Coppola, Hiltz, and Rotter (2002), Blignaut and Trollip (2003), and Morris, Xu, and Finnegan (2005). We further suggest that effective “organization” has implications for a more articulated conception of productive online instructional effort.

The third limitation relates to the locus of research investigating teaching presence which has been limited largely to threaded discussions. We were unable to identify studies that examined instructor teaching presence outside of online discussion or announcement areas (see Table 1). In order to fully understand the online instructional role we suggest that there is a need to document all observable instances of the three CoI presences. We intend to begin to close this gap by analyzing instructor interaction with students where important communicative processes take place: main threaded discussion area, course e-mail, private folders, instructor announcements, and areas where students pose general course-related questions. The need for examining entire courses has been discussed in previous research (Anderson et al., 2001; Archer, 2010; Shea et al., 2010; Shea et al., 2009; Shea, Vickers, et al., 2009).

Lastly, a careful review of the original teaching presence indicators developed by Anderson et al. (2001) reveals that they are largely reliant upon the threaded discussion activities of the instructor and thus fall short in identifying and articulating the full range of online collaborative tasks and effort demonstrated by both instructors and students.

Table 1

*Summary of Teaching Presence Research Examining Online Discussions*

<b>Authors</b>	<b>Date</b>	<b>Focus of research</b>	<b>Focus</b>	<b>Source of data</b>
Aykyol	2009	Content analysis, survey	Online and blended courses	Discussion transcripts, survey
Akyol & Garrison	2008	Content analysis, survey	Online courses	Discussion transcripts, survey
Anderson et al.	2001	Content analysis	Computer conference	Discussion transcripts
Braun	2008	Quasi-experimental repeated measures, Content analysis	Online courses	Discussion transcripts
Col, Engel, & Bustos	2009	Content analysis, Structural Analysis	Online courses	Discussion transcripts
Garrison, Anderson, & Archer	2000	Content analysis	Computer conference	Discussion transcripts

Gorsky & Blau	2009	Content analysis, survey	Online course	Discussion transcripts, survey, site usage logs
Ice, Curtis, Phillips, & Wells	2007	Content analysis, interviews	Online courses	Discussion transcripts, interviews
Kamin, O'Sullivan, Deterding, et al.	2006	Content analysis	Online course	Discussion transcripts
Kupczyński, Ice, Wisenmayer, & McCluskey	2010	Qualitative data transformation of open ended survey questions; Odds ratio analysis	Online courses	Surveys
Ling	2007	Discourse analysis, interviews	Online course	Discussion transcripts
Omale, Hung, Luetkehans, & Cooke-Plagwitz	2009	Content analysis, interviews	Online course	Discussion transcripts, interviews

Stodel, Thompson, & McDonald	2006	Interviews	Online course	Interviews
Shin	2008	Content analysis, survey, thread mapping	Computer conference	Discussion Transcripts, survey
Stein et al.	2007	Content analysis	Blended course	Discussion transcripts
Vaughan & Garrison	2006	Content analysis, survey	Blended courses	Discussion transcripts, interviews
Whipp & Lorentz	2009	Discourse analysis, interviews, content analysis	Blended courses	Discussion transcripts, announcements, interviews

## Methods and Data Sources

### Quantitative Content Analysis

We used quantitative content analysis to analyze CoI measures of teaching presence to compare a purposive sample of two identical sections of a fully online course taught by instructors who appeared to have very different ways of engaging with their students. The data for this research includes all of the content from two fully online upper-level courses in business management offered during the fall 2007 term by a state college in the Northeast United States that specializes in distance and adult education for non-traditional learners. Each section was identical, designed by content experts and instructional designers and was taught by experienced instructors, who were not the course designers.

The course had five modules of instruction and contained a variety of learning activities, including discussions, individual case studies, research papers, and group assignments. The following data sources were used for this study: five two-week long discussion forums, four small-group student discussion areas used to prepare a position paper, one full-group discussion where students presented their position papers as the basis for a class debate, course announcements, private folders for one-to-one student/instructor communication, a public ask-a-question area, and instructor e-mail, syllabus, and orientation materials, as well as module mini-lectures, assignments, and instructions.

### Sample and Coding

The sample for this study may be considered the individual messages coded in the two courses. The coders analyzed a total of 10 whole-class discussions and three small-group discussions across all five modules in each course. They examined 672 discussion posts in course A and 601 discussion posts in course B. Each sentence was examined using the message as the unit of analysis. In addition, the coders analyzed all course announcements, e-mails, individual private



folders, and question-and-answer areas, using the message as the unit of analysis for a total of 438 additional messages. Lastly the coders applied teaching presence measures to all course documents, which included all syllabus and orientation materials as well as module mini-lectures, assignments, and instructions. In all, 41 course documents were coded. The paragraph was the unit of analysis for these items. The coders also examined 102 student course artifacts, such as case studies and research papers. In total, 1,711 messages and 143 documents were reviewed by each coder. In all 3,422 individual analyses of the 1,711 messages were conducted by the two coders.

Inter-rater reliability was computed using Cohen's kappa and Holsti's coefficient of reliability. Previous research suggests that symmetrical imbalances in the marginal distributions of the coding table is problematic and can lead to low kappa despite high levels of observed agreement (Feinstein & Cicchetti, 1990). Because of this, Holsti's coefficient of reliability, which measures percent agreement, was also used to calculate inter-rater reliability. Our choice to utilize two measures of reliability follows Garrison et al.'s (2000) original research as well as Rourke, Anderson, Garrison, and Archer's (2001) coding suggestions. After calculating initial inter-rater reliability, the coders met to negotiate disagreements. This procedure of initial and negotiated coding also follows the protocols of Garrison and others in this line of research. It allows researchers to uncover errors in coding and to understand meaningful versus non-meaningful disagreements. Where disagreement remains after negotiation, authentic distinctions between coders exist. Inter-rater reliability metrics for this analysis are included in Appendix A, Table 1.

## **Coding Scheme Revisions**

As briefly described in a related study (Shea et al., 2010), our concerns that the original community of inquiry indicators were constrained by their focus on threaded discussions led us to re-examine Anderson et al.'s (2001) original teaching presence coding scheme. Given that Anderson et al. were working nearly a decade ago, it is in no way surprising that the emphasis of their work was on computer conferencing and the interaction that distinguished this form of distance learning from previous forms. It is our contention however that more recent models of online learning reflect significantly greater productive instructor work than found in threaded discussions alone. We used several approaches to revisit the original categories including examining other theoretical frameworks. We also identified revisions as a result of omissions and conflicts identified during the coding process and of assessing the impact of all changes on the overall coherence of the coding scheme.

## **Design and Organization (DE)**

Based on revisions published by Akyol (2009) a new indicator was added: *making macro-level comments about course content*. No changes were made to the remaining original indicators: *designing methods*, *establishing time parameters*, *utilizing the medium effectively*, and *establishing netiquette*. The original indicator *setting curriculum* was expanded to include *assessment*, which was also added by Akyol (2009) and was confirmed after examining the



course syllabus, orientation, and other documents and is in line with other research on effective methods for online course design (e.g., Palloff & Pratt, 2007; Simonson, 2009).

*Responding to technical concerns* was relocated from direct instruction (DI) and was added to *utilizing the medium effectively*, as many well-designed online courses include extensive instructions and other technical information to help students optimize their use of the online learning environment and to anticipate and prevent avoidable technical problems. It might also be noted that responding to technical issues is not a conventional component of direct instruction and may actually be more appropriately handled by a professional help desk in light of frequent reports that online instruction is more time intensive than traditional instruction.

## **Facilitating Discourse (FD)**

We retained five of Anderson's et al. six original indicators for the FD category: *identifying areas of agreement/disagreement*; *seeking to reach consensus/understanding*; *encouraging, acknowledging, or reinforcing student contributions*; *setting climate for learning*; and, *drawing in participants prompting discussion*.

Three of Anderson's original DI indicators were moved to the FD category because they were more closely aligned with this process. The first, *presenting content/questions* was renamed *presenting follow-up topics for discussion*. This was an attempt to identify ad hoc situations where the instructor or students presented content or questions to enhance learning. *Focusing discussion on specific issues* was amended to *refocusing* to better address instances where the instructor intervened to help participants focus on relevant issues and stay on topic. Lastly, *summarizing discussion* was reassigned here because the purpose of this task is not only to review discussion contributions but also to highlight key concepts and relationships to further facilitate and sustain discourse.

## **Direct Instruction (DI)**

Once this category was restructured to reassign indicators more closely tied to discourse to FD, it became necessary to further identify and describe other dimensions of the instructor's role in effectively presenting content in the online learning environment. We turned to Shulman's (1986) conceptualization of direct instruction as effective uses of "analogies, illustrations, examples, explanations and demonstrations" (p. 1022). As a result, a separate indicator was established for each of the above: *Providing valuable analogies, offering useful illustrations, conducting supportive demonstrations, and supplying clarifying information*. We retained one of Anderson's et al. original seven indicators: *Injecting knowledge from diverse sources, e.g., textbook, articles, internet, personal experiences*. The remaining original DI indicator, *diagnosing misperceptions*, served as the starting point for establishing a fifth category of indicators to address the assessment of learning activities within and beyond threaded discussion. It is clear that providing assessment is a central role of instructors, both online and in the classroom, but one that seems underrepresented in the CoI framework. (See also Akyol, 2009.)

## **Assessment (AS)**

We identified a potential fourth dimension of teaching presence, *assessment*. New indicators for assessment were derived as a result of examining the entire content of both courses for patterns of assessment. They include both formative and summative assessment across a broad range of instructor and student activities that occur within an online course. Two areas were closely identified with individual student assessment, namely participation in discussions and the completion of individual assignments. It was in these two new indicators that we incorporated Anderson's et al. original DI indicator *diagnosing misperceptions*. We also introduced a third form of assessment based on the role of the instructor in evaluating course design and the effectiveness of learning activities. The new indicators were as follows: *giving formative feedback for discussions, providing formative feedback for other assignments, soliciting formative assessment on course design and learning activities from students and other participants, delivering summative feedback for discussions, supplying summative feedback for other assignments, and soliciting summative assessment on course design and learning activities from other participants*. See Appendix B for the full revised teaching presence coding scheme.

## **Research Questions**

This paper represents work in an ongoing project to examine online learning through the community of inquiry framework with a goal of enhancing and further articulating the model. To accomplish this we both revised categories within the framework and undertook extensive analysis of online courses using quantitative content analysis. To extend previous work we utilized the revised teaching presence indicators to examine components of courses not typically included in previous analyses to address the following research questions.

1. Where does teaching presence occur in online courses?
2. How do instructors employ communicative functionality within the course to demonstrate teaching presence?
3. In what ways do students demonstrate teaching presence?
4. Does teaching presence shift over time?
5. Does teaching presence correlate with learning outcomes reflected in instructor-assigned grades?

## **Results**

1. Where does teaching presence occur in online courses?

Initial examination of course discussions indicated that the two instructors exhibited very different patterns of teaching presence. Both instructors appeared engaged with their students in the first module as indicated in Table 2. However instructor B appears to have been far less involved in subsequent modules.

Table 2

*Individual Instructor TP Indicators in Threaded Discussion per Module by Course*

Module	1	2	3	4	5	Total
Instructor A TP	13	2	3	5	3	25
Instructor B TP	14	3	0	0	0	16

Instructor A continued to demonstrate teaching presence in all discussions; whereas, instructor B appeared to reduce participating significantly and then ceased to post to the main discussion area. A conventional analysis focused on discussion transcripts might view this as an example of abandonment on the part of the instructor. Table 3 indicates that overall levels of teaching presence activity outside the discussions were comparable between the two instructors. Instructor A had a total of 153 teaching presence indicators. Instructor B had 167 total teaching presence indicators. These indicators were tallied by joint coding of e-mails, private folders, bulletin board/announcements, and question areas, which reflect significant instructional effort.

Instructor teaching presence activity in areas external to the main discussion accounted for an unexpected proportion of total instructor activity. For example, instructor A's non-discussion activity accounted for 88% of his overall teaching presence measures relative to his discussion forums, which contributed just 16%. For instructor B, who took an active role in only the first discussion and faded from view during the remaining four, this accounted for only 10% of his total teaching presence. Yet this same instructor compensated for his absence with non-discussion activities which contributed 90% of his teaching presence measures (see Table 3).

Table 3

*TP In and Out of Threaded Discussion*

Instructor	Discussion	DE	FD	DI	AS	All TP
A	In	0	12	11	3	26
	%	0.00%	100.00%	78.57%	7.31%	16.99%
	Outside	86	0	3	38	127
	%	100.00%	0.00%	21.43%	92.68%	83.01%
	Total	86	12	14	41	153
	Total %	56.21%	7.84%	9.15%	26.80%	100%
B	In	5	6	2	3	16
	%	11.90%	66.67%	25.00%	2.78%	9.47%
	Outside	37	3	6	105	151
	%	88.10%	33.33%	75.00%	97.22%	90.53%
	Total	42	9	8	108	167
	Total %	24.58%	5.32%	4.73%	63.91%	100%

A different view comparing instructional effort by both instructors in and out of threaded discussions is reflected in Figure 1. As can be seen, instructor teaching presence occurred with much greater frequency outside of threaded discussions.

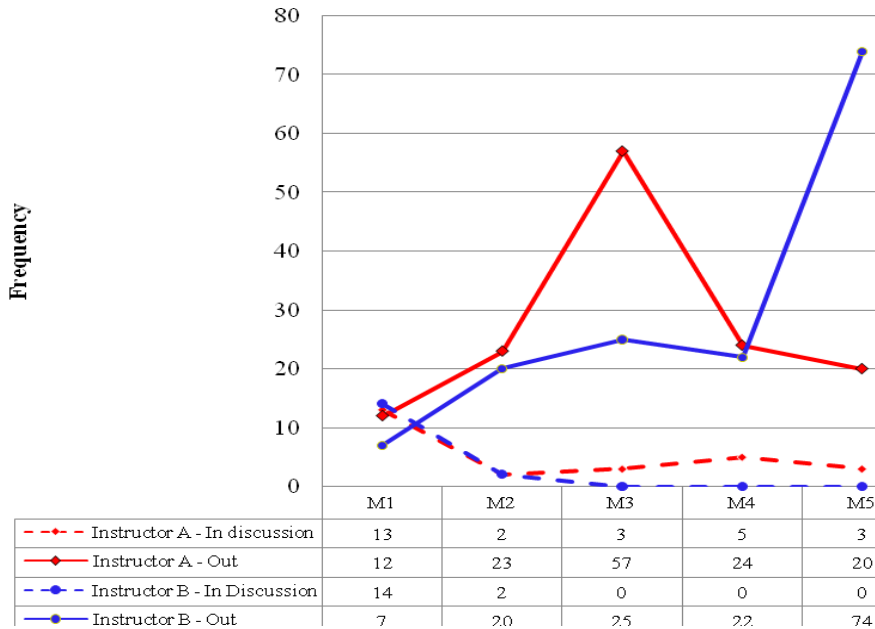


Figure 1. Teaching presence in and out of threaded discussions.

2. How do instructors employ communicative functionality within the course to demonstrate teaching presence?

Another perspective on the expression of teaching presence can be seen in the various ways in which different instructors utilize course functions to interact with students. Table 4 indicates that while instructor A communicated primarily through the private folder function, instructor B interacted predominantly through course e-mail.

Table 4

*Instructor Teaching Presence % by Area*

Instructor	Private folder	Ask a question	Announcements	E-mail	Discussion
A	54.32%	8.64%	20.99%	0.00%	16.05%
B	3.55%	5.92%	2.96%	78.11%	9.47%

3. In what ways do students demonstrate teaching presence?

As reported previously (Shea et al., 2010) we found that overall teaching presence varied widely both within and between the courses for both the instructor and the students. In threaded discussions, both instructors began the courses with similar levels of involvement in terms of

teaching presence and then reduced their presence substantially as can be seen in Figures 2 and 3 below.

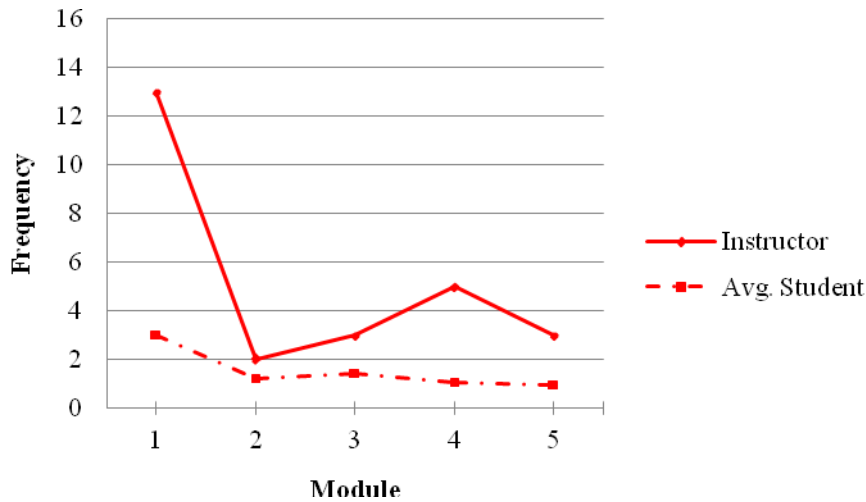


Figure 2. Course A: Instructor TP versus average student TP.

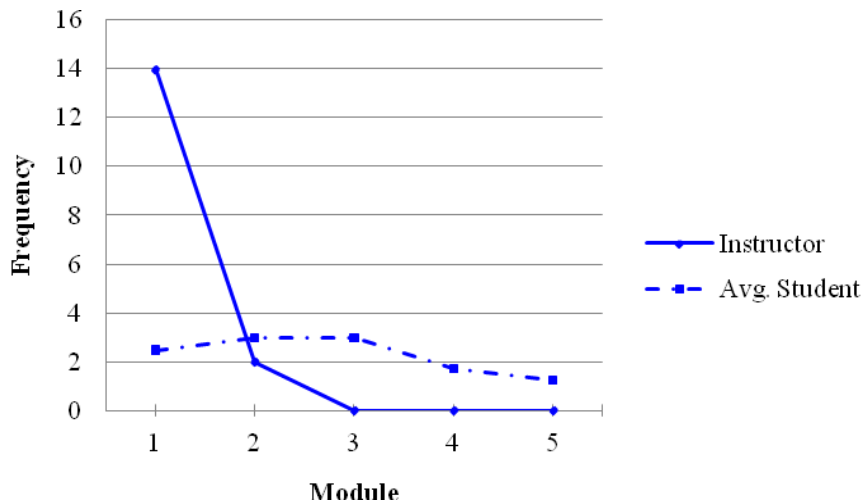


Figure 3. Course B: Instructor TP versus average student TP.

These results suggest that students' teaching presence may have a "floor" threshold level and when the instructor's participation within the threaded discussion drops to zero students attempt to recreate "instructional equilibrium." Figure 3 documents slightly higher levels of teaching presence on the part of the students in course B despite the lack of instructor teaching presence after the second module.

In addition to the regular discussion in module 2, students were instructed to participate in a "debate" of outsourcing, and students were assigned to argue either for or against the topic.

Students were divided into four groups (Pro 1, Pro 2, Con 1, and Con 2) and required to collaboratively author a position paper. This resulted in four tangible products, including a position paper, either for or against the practice of outsourcing, which was to be used as the starting point for each groups' participation in the fifth class discussion, the debate. When examining the class debate activities in module 2, we identified very different patterns of activity. Although five total discussions (three preparatory sections and two whole-group discussions) were coded in connection with these learning activities, it is important to note that the tasks and outcomes of discussion areas were very different from the rest of the course. We found that TP codes were not reliable when used to code discussion areas that were not based on whole-class threaded discussion, e.g., discussion areas where students were focused on the collaborative development of a product. Table 5 reflects inter-rater reliability for attempts to code. As a result, our team decided to discontinue coding debate sections and chose to focus on issues that may have caused recurrent disagreements.

Table 5

Module 2 Debate

	Cohen's Kappa				Holsti's CR			
	Course A		Course B		Course A		Course B	
	Initial	Negotiated	Initial	Negotiated	Initial	Negotiated	Initial	Negotiated
Debate Con 1	0.17	0.50	-0.06	0.68	0.51	0.69	0.54	0.86
Debate Con 2	--*	--*	0.34	0.76	--*	--*	0.70	0.88
Debate	0.40	0.70	0.31	0.90	0.98	0.99	0.60	0.94

\*This section was uncoded. Coding discontinued after Course A Con 1 coding.

Because these four preparatory discussions in module 2 were not strictly focused on intellectual exchange but had a more concrete and practical purpose, namely authoring each groups' position paper, the researchers questioned the relevance of the teaching presence codes after attempting to code and negotiate two of these preparatory discussions. Although some of the teaching presence codes appeared to be applicable – *setting time parameters, drawing in participants, presenting follow-up topics for discussions* – the discourse was less reflective of content based knowledge construction and more focused on the process of effective collaboration to produce a group product.

We gained insight into our lack of agreement in coding the debates by examining Curtis and Lawson's (2001) coding scheme for online collaboration, which is based on Johnson and Johnson's (1996) major behaviors in collaborative learning situations (p. 26). Curtis and Lawson examined student-to-student interactions in e-mail messages and postings to group discussion boards to identify the following behavior categories: planning, contributing, seeking input, reflection/monitoring, and social interaction. When we compared the revised teaching presence indicators with this coding scheme, we found that the first three indicators better represented student-to-student collaborative actions and tasks that were focused on product-based outcomes, such as group-authored written work. Given that such student-to-student collaborative interaction

could be coded reliably using the teaching presence construct led us to question whether there may be a need to focus more attention on the distinct roles of learners in online education separate from the role of the instructor.

#### 4. Does teaching presence change over time?

When accounting for instructor teaching presence in all areas of a course, we see that there is a certain ebb and flow to teaching presence. Figure 4 illustrates how both instructors exhibited similar levels of teaching presence in modules one, two, and four. Instructor A's teaching presence increased greatly in module 3, and instructor B's teaching presence saw a dramatic increase in module 5.

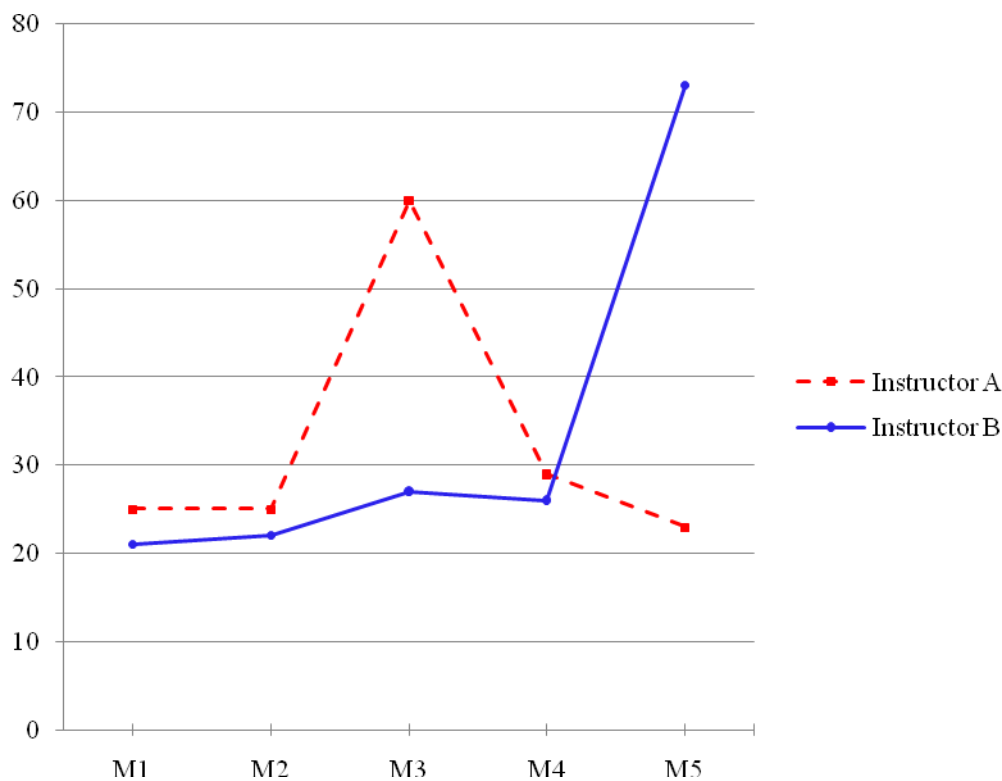


Figure 4. Total teaching presence over time.

A closer examination of itemized teaching presence behaviors reveals increases in assessment within the two modules in question (see Table 6) and an increase in design and organization for instructor A.

Table 6

*Total Course-wide TP Breakdown by Instructor by Module*

Module	Instructor A				Instructor B			
	DE	FD	DI	AS	DE	FD	DI	AS
1	9	7	7	2	12	5	2	2
2	15	1	1	6	16	1	1	4
3	31	1	3	23	7	0	0	18
4	20	3	2	4	1	0	4	17
5	11	0	1	6	6	0	1	67

5. Does teaching presence correlate with learning outcomes reflected in instructor-assigned grades?

Finally, we sought to understand whether and to what degree teaching presence can be correlated with learning outcomes reflected in instructor assessments of student learning. To accomplish this we compared teaching presence evidenced within module 3 in course B with grades given on the case study assignment directly related to the online discussion for that module. The research team selected this module because there was a close correspondence between the topic of discussion and the nature of the assignment. The correlation between the expression of teaching presence and assignment grades of the students ( $n = 17$ ) was statistically significant,  $r = .55, p < .05$

## Discussion

### Scholarly Significance

These results have a number of implications for research and practice in the rapidly developing arena of online teaching and learning. While other research has investigated instructor interaction throughout an entire course (e.g., Davidson-Shivers, 2009), this project is one of the first studies to comprehensively document productive instructional effort, utilizing a theoretical framework developed for online learning. Through meticulous coding of thousands of online instructional activities our investigation revealed that the work of the online instructor may be significantly underrepresented by conventional analyses originating in research on computer conferencing. We suggest that the bulk of online instructional effort occurs outside such fora and that to gain additional insight into the nature of online instruction it is necessary to examine work occurring throughout the entire course.

Our research also revealed that restricting analysis of teaching presence to discussion areas may present too narrow a view of individual instructor's effort. Some instructors may take a strategic approach by participating in early discussions to model how to formulate probing questions and



by providing direct feedback with the goal of withdrawing once this scaffolding is completed. As a result, we suggest that this traditional research approach can overlook important aspects of the expression of teaching presence.

We further suggest that gaining insight into online teaching requires a conceptual framing. The analysis conducted here not only documents instances of effort, such as frequencies of teacher posting, but confirms the accepted categories of pedagogical work that includes instructional design, facilitation of productive discourse, and direct instruction. At the same time, this study also confirms a fourth TP dimension, assessment. When considered together these constructs represent initial steps towards a more encompassing explanatory model of the effort involved in teaching and learning in online environments.

Research is beginning to recognize the importance of feedback in a community of inquiry (e.g., Kupczynski, Ice, Wiesenmayer, & McCluskey, 2010). When analyzing only threaded discussions, the opportunity to see the significant effort associated with assessment is greatly reduced. As Table 3 illustrates, instructors A and B provided the majority of assessment outside of threaded discussions (93% and 97% respectively). Our results show that a majority of instructor B's teaching presence (64%) was assessment of some form, and almost all of that was provided outside threaded discourse. In order to fully understand and represent teaching presence in an online course, research should recognize the importance of understanding and measuring assessment and looking for it in areas it is most likely to occur (i.e., outside threaded discourse).

These results also document a significant correlation between instructional effort reflected in frequency of teaching presence behaviors and learning outcomes evidence through instructor-assigned grades on closely related assignments. This result is significant in light of past critique (e.g., Rourke & Kanuka, 2009) of the CoI framework, complaining of a gap in evidence between the conceptual model and evidence of "objective" measures of learning in online courses. We suggest that these results represent a tentative step towards closing that gap.

Our analysis of the discourse of students engaged in the logistics of group projects (e.g., collaboration around preparing for debates) indicates that it does not conform to the patterns of teaching presence identified in other kinds of student interaction, such as whole-class discussion. These anomalies suggest that students are engaged in forms of interaction in the service of accomplishing learning goals that are unaccounted for in the community of inquiry framework as it currently exists. We believe that these exceptions represent fertile ground for extending the framework. Students communicating around group learning tasks reflect forms of learner self- and co-regulation (e.g., Zimmerman & Schunk, 2001) and highlight the role of effective learners as distinct from effective teachers. In activities typical of collaborative educational models learners need to engage in forms of planning, monitoring, and strategy characteristic of learner qua learners in order to be successful. These behaviors are distinct from those taken on by instructors. We conclude that further articulating the kinds of self- and co-regulation that are appropriate to the online environment should be a goal of future research (see e.g., Shea & Bidjerano, 2010).

## **Practitioner Significance**

These results also have implications for practice as they relate to instructor behavior and instructional design of online courses. If students' perceptions indicate that they place a premium on instructor interaction (Anderson, 2003; Shea et al., 2006) instructors must actively manage students' expectations about the nature of online learning and the role of the instructor in this process. Online instructors can accomplish this by taking the time to communicate that online courses are not teacher-centered models of learning and by explaining the rationale behind student-to-student interaction in negotiating shared meaning through discourse. We also recommend that instructors make clear to their students to what extent and in what capacity they will participate in course discussions.

Once the course is underway, instructors who choose not to participate actively in discussions should continue to make visible their direct involvement in the course. This can be accomplished by using the announcement feature to comment on discussion group progress, by posting class reminders, and by communicating privately with students who are ineffective in their postings or who fail to participate. Instructors can also create opportunities for students to develop their own forms of teaching presence by taking an active role in the initial discussion, modeling how to ask questions that probe and add depth. Later on in the course, instructors can assign roles to students where they can moderate, summarize, and integrate multiple viewpoints.

In terms of instructional design, our findings related to the strong correlation between student grades for case studies and the frequency of student teaching presence behaviors in instructor B's course suggest a positive relationship between learning outcomes and online instructional effort as described by the teaching presence construct. Although prior research states that higher levels of cognitive presence (integration and resolutions stages) are unlikely to occur in online discussions (Garrison et al., 2000; Schrire, 2006; Kanuka, Rourke, & Laflamme 2007; Vaughn & Garrison, 2006; Stein, Wanstreet, Engle, Glazer, Harris, Johnston, Simons, & Trinko, 2006), we believe that there is value in pursuing integrative design for cognitive presence. One promising approach is to relate discussion content to other learning activities as a way to create opportunities for students to probe deeply and to draw meaningful connections between concepts and topics addressed in public discourse and in their own private cognition as they work on individual written assignments. When follow-up assignments are tied to the public discourse that is facilitated through teaching presence, our results show a strong correlation between objective measures of learning (grades) and this element of the community of inquiry framework. Instructors and instructional designers should make efforts to tie discussions and follow-up learning activities together to gain this benefit.

These results have implications for other practitioners involved in the online education enterprise, including administrators. When considering the increasingly common practice of monitoring online instructors in some institutional settings (e.g., Epstein, 2010), it is important to realize that instructors can establish their presence in varied and subtle ways. In this study we found that the effectiveness of the instructor did not depend on participation within the threaded discussion *per se*, but that responsiveness and effective interaction with students was carried out through a

variety of forums, including the ask-a-question area, email, and other modes of communication. We suggest that benchmarks for effective interaction be communicated to instructors and that institutions provide training and support for online faculty around teaching presence. We also encourage institutions that practice monitoring of faculty to communicate policies about such monitoring and to consider its likely impact on organizational trust (e.g., Knox, 2010). At a minimum, such policies should consider the whole course and the instructional effort and forms of teaching presence reflected outside the narrow band of activity occurring solely in online discussions.

## **Study Limitations and Future Research**

Content analysis is a time- and labor-intensive process. This study was based on the careful review of thousands of individual messages by multiple coders. However there are a number of limitations. Because this study used a purposive sample of two archived course sections, and analysis did not begin until approximately eight months after each course ended, it was not feasible to ask the instructors or students through interviews or surveys to reconstruct their participation. In the future these findings might be expanded by examining a broader mix of courses and instructional styles and by conducting interviews to learn more about the intentional and unintentional efforts that online instructors make in manifesting their teaching presence by focusing on both *when* and *where* they focus their instructional effort. Finally, surveys of student attitudes might reveal their perceptions of the effectiveness of these varied approaches.

## **Conclusions**

The current research is among the first to look at an entire course using CoI as an investigative tool. While theoretical constructs hold true, questions of reliable application of categories and indicators as a coding tool across an entire course are raised. When the nature of the communicative event moves from threaded discussion to collaborative groups of a different nature (e.g., jigsaw-type activities), the current teaching presence coding scheme may not apply. We suggest that the role of online students may require further articulation and that the theoretical and empirical literature on self-regulated learning may be particularly relevant to the demands of the online environment (Shea & Bidjerano, 2010).

In order to fully represent a community of inquiry in online environments, we concur with previous researchers (e.g., Anderson 2001; Archer 2010) that researchers need to begin looking at entire courses and not just at threaded discussions or survey data. Because categories and indicators currently employed in CoI research have been primarily conceived through analysis of threaded discussions, future research needs to critically examine their applicability at a course-wide level and to make appropriate changes in order to effectively and reliably measure all three forms of presence within the community of inquiry framework.

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## Appendix A

Table 1

*Inter-rater Reliability for Artifact Coding*

	Cohen's Kappa				Holsti's CR			
	Course A		Course B		Course A		Course B	
	Initial	Negotiated	Initial	Negotiated	Initial	Negotiated	Initial	Negotiated
Private Folder	0.91	0.97	0.89	1.00	0.96	0.99	0.94	1.00
Question	0.94	0.94	0.88	1.00	0.97	0.97	0.95	1.00
E-mail	--*	--*	0.67	0.84	--	--	0.98	0.99
Announcements	0.85	0.95	0.46	1.00	0.96	0.99	0.85	1.00

\*The instructor for Course A did not use this feature

Table 2

*Instructor Discussion IRR*

Cohen's Kappa				Holsti's CR			
Course A		Course B		Course A		Course B	
Initial	Negotiated	Initial	Negotiated	Initial	Negotiated	Initial	Negotiated
0.1379	0.9678	0.4856	0.9312	0.4819	0.9778	0.7317	0.9729

## Appendix B

### Coding Scheme for Teaching Presence Showing Revisions

Categories	Indicators	Code	Definition	Revisions
<b>Design &amp; Organization (DE)</b>	Setting curriculum and communicating assessment methods to be used in the course	<b>TP-DE1</b>	Communicates important course outcomes, e.g. documentation of course goals, topics, rubrics and instructor expectations	Assessment added to definition by Z. Akyol (2009).
	Designing methods	<b>TP-DE2</b>	Provides clear instructions how to participate in course learning activities, e.g., clear explanation of how to complete course assignments successfully	
	Establishing time parameters	<b>TP-DE3</b>	Communicates important due dates/time frames for learning activities to help students keep pace with the course, e.g. accurate course schedule	
	Utilizing medium effectively	<b>TP-DE4</b>	Assists students to take advantage of the online environment to enhance learning e.g., using LMS features for learning activities and resolving technical problems	Shea et al. (2010) added using LMS features. “Responding to technical concerns” was relocated from Direct Instruction category.
	Establishing netiquette	<b>TP-DE5</b>	Helps students understand and practice the kinds of behaviors that are acceptable in online learning, e.g., providing documentation on polite forms of online interaction	
	Making macro-level comments about course content	<b>TP-DE6</b>	Provides rationale for assignment/topic	New indicator added by Z. Akyol (2009).
<b>Facilitating Discourse (FD)</b>	Identifying Areas of Agreement/disagreement	<b>TP-FD1</b>	Helps to identify areas of agreement and disagreement on course topics in order to enhance student learning	
	Seeking to reach consensus	<b>TP-FD2</b>	Assists in guiding class toward agreement about	

			course topics in a way to enhance student learning	
	Encouraging, acknowledging or reinforcing student contributions	<b>TP-FD3</b>	Acknowledges student participation in the course, e.g., replied in a positive encouraging manner to student submissions	
	Setting climate for learning	<b>TP-FD4</b>	Encourages students to explore concepts in the course, e.g., promotes the exploration of new ideas	
	Drawing in participants, Prompting discussion	<b>TP-FD5</b>	Helps keep students engaged and participating in productive dialog	
	Presenting follow-up topics for discussions (ad hoc)	<b>TP-FD6</b>	Presents content or questions related to the discussion.	Originally called “Present content and questions” under Direct Instruction. Shea et al. (2010) integrated into this category.
	Refocusing discussion on specific issues	<b>TP-FD7</b>	Helps focus discussion on relevant issues keeps participants on topic	Shea et al. (2010) relocated from Direct Instruction
	Summarizing discussion	<b>TP-FD8</b>	Reviews and summarizes discussion contributions to highlight key concepts and relationships to further facilitate discourse	Shea et al. (2010) relocated from Direct Instruction
<b>Direct Instruction (DI)</b>	Providing valuable analogies	<b>TP-DI1</b>	Attempts to rephrase/reformulate course material in ways that highlight similarities between content assumed to be understood and new content with the goal of making the material more comprehensible	Added by Shea et al. (2010)
	Offering useful illustrations	<b>TP-DI2</b>	Attempts to make course content more comprehensible by providing examples that are substantive and advance understanding	Added by Shea et al. (2010)
	Conducting informative demonstrations	<b>TP-DI3</b>	Attempts to make course content more comprehensible	Added by Shea et al. (2010)

			through the exhibition of processes	
	Supplying clarifying information	<b>TP-DI4</b>	Attempts to reduce confusion or misconceptions about course content by providing additional explanations.	
	Making explicit reference to outside material	<b>TP-DI5</b>	Provides useful information from a variety of sources, e.g., articles, textbooks, personal experiences, or links to external web sites. Confirm if we want to include personal experience here.	
<b>Assessment (AS)</b>	Giving formative feedback for discussions	<b>TP-AS1</b>	Explicitly evaluates discussion/offers feedback OR diagnoses misconceptions to help students learn	Shea et al. (2001) reworked “confirm understanding through assessment and explanatory feedback” and incorporated “Diagnosing misperceptions” from Direct Instruction.
	Providing formative feedback for other assignments	<b>TP-AS2</b>	Explicitly evaluates other assignment types/offers feedback OR diagnoses misconceptions to help students learn	Shea et al. (2010) incorporated “Diagnosing misperceptions” from Direct Instruction.
	Delivering summative feedback for discussions	<b>TP-AS3</b>	Provides post mortem feedback on discussions, including grades	Added by Shea et al. (2010)
	Supplying summative feedback for other assignments	<b>TP-AS4</b>	Provides post mortem feedback on other assignments, including grades	Added by Shea et al. (2010)
	Soliciting formative assessment on course design and learning activities from students and other participants	<b>TP-AS5</b>	Seeks feedback upon completion of modules or during mid-course.	Added by Shea et al. (2010)
	Soliciting summative assessment on course design and learning activities from students and other participants	<b>TP-AS6</b>	Seeks meta-level feedback at close of course.	Added by Shea et al. (2010)





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## ***Book Review***

### ***A Designer's Log: Case Studies in Instructional Design***

**Author:** Michael Power (2009). [A Designer's Log: Case Studies in Instructional Design](#). Athabasca, Alberta, Canada: AU Press. ISBN 978-1-897425-61-9 (Print). ISBN 978-1-897425-46-6 (Electronic). Available for download under a Creative Commons License.

**Reviewer:** Airina Volungevičienė, Vytautas Magnus University, Lithuania

When instructional designers and teachers think of Donald A. Schön's ideas about "reflective practitioners," we should read Michael Power's *A Designer's Log*. I admire the way in which Power, as a "reflective practitioner," records his analysis of his practice as a responsible professional: what he *can* do, what he *is* doing, and what he *should* do in order to assist teachers and faculty members at a dual-mode university to apply instructional design to online and blended learning.

The book is organized into three major areas: Introduction, The Case Studies, and Synthesis and Final Prototype.

In the introduction, the author describes principles embodied in the instructional design model that he uses in practice, challenges he encounters at his dual-mode institution, and the prototype development process. These become the milestones for the 10 case studies that form the central focus of the book.

The author reports on his experiences, recorded in a logbook over a three-year period, as he assisted 10 faculty members to implement the "proposed instructional design model prototype" for distance education. To implement this instructional-design model, Power explains the importance of providing a careful and individualized approach to each case, of expressing confidence in advice and decision-making, and of showing respect for both the tradition and the culture of the dual-mode institution in order to promote faculty members' movement from an on-campus teaching paradigm to an online teaching paradigm.

The second part of the book presents 10 case studies that detail the experience of working with professors to adapt instructional design to their teaching practice. Using a simple log-narrative

style, Michael Power raises hot issues, recounting how tradition is “losing ground with regard to what is taught.” The reader becomes aware of certain dimensions of the process of principle-based design: Interpersonal communications and continuous reflection on action are maintained to preserve “good” instructional practice, and decisions are postponed until collaborative discussions lead to shared understanding and until both the instructional designer and the teacher find their own improvement paths. Following a meta-reflective approach, each case study reports on the different sessions between the instructional designer and the faculty member and concludes with the results of an ex post facto interview or mutual reflection.

The third part, which might be considered most important for the author and for readers, is entitled “Synthesis and Final Prototype.” Here, the readers can find Power’s purpose: “I started this study with one goal in mind: developing an instructional design prototype model adapted to the needs of faculty working at a dual-mode university.” Although it is unusual to find the purpose of the study at the end of the book, this only underlines the consistent approach of the author: to accompany faculty members through a process of professional development as they apply principles of instructional design to online and blended learning; to improve a tool to ease or facilitate such learning; and to conduct research intended to support instructional design.

Plunging into the case studies was so fascinating that it was difficult to come to the end of the story. Readers may be happy to receive the author’s affirmations that his study demonstrated not only that the “online design process is endless,” but also that “for a successful design prototype to be successfully implemented in a traditional university setting, it had to be based on ‘low structure’ and high ‘dialog’ (Moore, 1993) and must emulate traditional university practices and operations.”

What I admire most about this book are the principles of instructional design embodied in the online-learning (OL) deployment model, which is described at the beginning of the book, and which was subsequently improved following the book’s first printing in French. The recommendations suggested in the epilogue are applicable to all our institutions around the world! Because they address our everyday activities, we must read these lessons and learn from them.

I encourage all faculty members who seek to improve their professional practice of blended and online learning, as well as instructional designers who accompany faculty members in that endeavor, to read Michael Power’s *A Designer’s Log: Case Studies in Instructional Design*.

Thank you, Michael Power, for taking the time to share this with us.



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## ***Book Review***

# ***Accessible Elements: Teaching Science Online and at a Distance***

**Editors:** Dietmar Kennepohl and Lawton Shaw (2010). [Accessible Elements: Teaching Science Online and at a Distance](#). Athabasca, Alberta: AU Press. 978-1-897425-48-0 (e-book).

**Reviewer:** Brian F. Woodfield, Brigham Young University, USA

### **Introduction**

Many have argued that the advancement of science and technology is the foundation upon which much of the economic development of the past century has been established. Although economic prosperity has clearly not been uniform across the world, it is still widely accepted that a fundamental key to progress in any region is education, and in particular, education in the science- and engineering-related fields. A recurring topic in the broader educational community, however, is how to provide education to an ever-increasing population with widely different economic and cultural backgrounds. Although societies have changed drastically, a face-to-face residential model is still generally accepted as the preferred or ideal approach to imparting knowledge, and more importantly, to developing creativity. However, this model is woefully inefficient, even elitist in many cases, and denies access to large parts of many populations. Perhaps contrary to popular belief, distance education (DE) has been around for more than a century. For many decades, DE programs were known as correspondence courses, but since the development of the Internet, DE has migrated online and is now often referred to as online education. Regardless of the name given, teaching at a distance has become much more widely accepted recently and is now a focus of educational research in order to better understand what works, what doesn't, and what can be improved.

Teaching science, either traditionally or at a distance, is unique when compared to other disciplines because in addition to theory and “paper and pencil” work, the subject requires a laboratory component. It is this laboratory component that has always been a challenge for DE and the subject is now receiving an increasing amount of attention. Because science is a laboratory discipline by nature, it is obvious that students need to learn laboratory and manipulative skills, but they must also experience a laboratory environment and develop the higher order cognitive skills that are necessary for laboratory work. It is this very subject that

forms the core of *Accessible Elements, Teaching Science Online and at a Distance*. The editors attempt to provide a wide-ranging focus on the dominant issues of teaching science online, but the recurring theme throughout the book is the need to teach the practical or laboratory side of the discipline at a distance. This is a useful book that for the first time appears to provide a valuable starting point to discuss the theoretical, practical, and logistical issues involved in developing and delivering a quality online or DE science course. For all those involved in teaching science online it is worth reading, but I also found that the editors omitted a thoughtful and thorough discussion of the merits and place of virtual labs in a DE curriculum. No review is provided of what virtual labs are available, and a critique of their quality and utility is absent. Indeed, even the author of the foreword points out this deficiency. Of course, the editors and many of the chapter authors mention virtual labs, but in my opinion, the authors dismiss virtual labs out of hand. They focus instead on the obvious value of hands-on laboratory experiences, ignoring other cognitive skills that are just as important and likely better taught in a virtual laboratory environment.

The remainder of this review will first provide a synopsis of the book, followed by a discussion of virtual labs and how they can be used to enhance laboratory instruction either in a residential or online program.

## **Synopsis**

The general purpose of *Accessible Elements* is to provide a broad perspective on the theoretical, practical, and logistical aspects of teaching science online and at a distance. The editors have divided the book into three sections reflecting these topics, which they call Learning, Laboratories, and Logistics. While there are obvious gaps in the topics they have chosen to study, mentioned previously, the information the editors have provided is meaningful and useful. I would certainly recommend this book to all those contemplating the development of or who are currently involved in online science education. One observation I must point out is that a quarter of the selected authors originate from Athabasca University, and thus my concern is that the perspectives included in the book are potentially limited. For example, it would be interesting to know the viewpoints of instructors teaching science at a distance from for-profit institutions as well as from public and private schools. Provided below is a brief synopsis of each of the sections in the book.

### **Learning**

The focus of this section is the theoretical foundation that allows the teaching of science at a distance. The first chapter establishes the student–student and student–teacher interactions that are necessary for teaching and describes the methods for carrying out these interactions in a DE course. In chapter 2, the focus changes from student–teacher interactions to interactions that must occur at an institution in order to achieve the targeted learning outcomes. A key point made in this chapter is that the interactions in institutions required for good teaching are universal and not limited to DE. Chapter 3 focuses on the course development team and discusses the relationships between content, design, and the use of technology. Chapter 4 explores the need for flexibility in learning, that is, the need for institutions to investigate and understand different learning delivery

modes (residential, online, traditional texts, etc.) and then to combine these modes in a consistent program that works for the demographics of the targeted student body. I found this chapter to be particularly useful because it encourages administrators, development teams, and instructors to look at all the tools that are available to them rather than limiting courses to a particular delivery mode.

## **Laboratories**

In this section, the editors focus on the core elements of teaching at a distance and describe how the laboratory component can be taught to non-residential students. In chapter 5, the authors focus on home experiments or “kitchen chemistry,” describing how they have developed robust kits that can be mailed to students, allowing them to perform traditional introductory chemistry experiments. The authors also report research that supports the viability of using kits to teach the laboratory component at a distance when compared to a traditional model. These kits go well beyond stereotypical “kitchen chemistry” and are surprisingly effective. Chapter 6 repeats the same discussion but in the context of the biological sciences. The authors also make the point that advanced biological laboratories require a residential laboratory component because of the need for advanced equipment. Chapter 7 covers the discussion about physics experiments (which turn out to be easier than chemistry experiments), and chapter 8 focuses on the earth sciences. Chapter 9 is unique because it explores remote access laboratories, which provide a third option beyond home kits and residential laboratories for the various disciplines.

## **Logistics**

The final section of the book covers the logistical concerns of delivering science content under various circumstances. In chapter 10, the authors use Athabasca University as an example and first discuss the personnel required to manage their online laboratory component. They then do a cost analysis to show that the use of home kits involves similar costs to those incurred by traditional methods to deliver the laboratory component. Chapter 11 presents a discussion of the logistical difficulties associated with providing science education in a third world country by showing how science is taught at a mega-university in Bangladesh. Chapter 12 continues with a similar discussion using the example of the University of South Pacific, describing the difficulties of covering an enormous geographical territory. Finally, chapter 13 provides an opinion on the future of DE in the context of the barriers currently faced by educators.

## **Virtual Laboratories**

Computers are now ubiquitous in education and especially in DE. My personal perspective may provide a unique insight into the issues governing the implementation of a DE course and the use of virtual labs. Although I have been a chemistry professor for over 13 years, my family background is in computer science. My father was one of the pioneers working during the infancy of computers in the early 1950s and was involved in many large-scale space and military projects,

including Gemini, Apollo, and several complex defense systems. He had a saying that we, as children, were constantly reminded of:

Computers are just a tool. They are very useful for some things and essentially useless for others. If a computer does not make your life easier, or allow you to do things you would not normally be able to perform, then why use one?

I feel this perspective best illustrates a good approach to providing laboratory instruction at a distance. What are the tools at our disposal, what are the strengths and weaknesses of each, and how do we use them to complement each other? It is unlikely that any one tool will provide a complete solution. Within this context, I think it is appropriate to revisit how we can provide a laboratory component at a distance.

To begin the discussion, I must return to the purpose of having students perform laboratory assignments. The authors of chapter 5 provide as good a description as any when they summarize that the aims of laboratory work are to teach (a) manipulation, (b) observation and recording, (c) processing and interpreting data, and (d) planning experiments (p. 87). In my experience as a research chemist I would also add a fifth aim, decision-making and deductive reasoning skills, although this could fall within the general “processing and interpreting data” aim given by the authors. If these are the goals of instructional laboratory work, the question is: Do residential and kit-based laboratories achieve all of these aims? While I fully agree with the various authors in the book that hands-on laboratories are necessary and even vital, in my experience not all of the goals are met when placing students exclusively in “real” instructional laboratory settings. Because of time, safety, liability, and cost constraints, students in an actual laboratory setting are often reduced to a cookbook mentality where they blindly follow instructions for both procedures and data analysis (Woodfield et al., 2004; Woodfield et al., 2005; Swan, 2008). Certainly there are exceptions to this observation, and some students are able to enjoy real, open-ended environments, but many others are not afforded such opportunities and can only perform experiments in narrowly constrained environments. In such environments, students certainly experience (a) basic laboratory skills and (b) observation and recording, but it is questionable whether they are able to independently process and analyze data (without significant guidance from instructors), and in particular, to plan and design experiments. In addition, the scope of experiments that students can perform is, for the most part, extremely limited when compared to the breadth of scientific research.

Another way of looking at the aims of laboratory instruction is that lab work should provide students with a glimpse of what real science is. That is, it should show them what scientists do, what they experience in the laboratory, and how they think. Scientists manipulate lab equipment, record and analyze data, and design experiments, but they do this in an open-ended environment where what they observe is new, where the interpretation and understanding of these data require creativity and the application of diverse concepts and skills, and where the answer is not known. While not all students are going to be scientists, skills for coping with an open-ended environment without knowing the “correct” answer are useful in every walk of life. Actual or

real-world laboratory environments, whether they are conducted at school or created at home with kits, are just one tool for educators to teach students these important skills.

Students must physically experience and feel how experiments are done in the laboratory as a part of learning these skills, but an appropriately designed and constructed virtual environment can complement real-world laboratories by providing a safe, open-ended, and accessible environment for students to design experiments, to make decisions, and to suffer consequences without the constraints of time, safety, liability, and costs (Woodfield et al., 2004; Woodfield et al., 2005; Swan, 2008). Yes, virtual laboratories do a poor job of teaching manipulatives, but when appropriately designed they are, in many cases, superior for teaching students how to cope with science in an unstructured environment. I am not talking about replacing real-world labs entirely, but rather about enhancing them with virtual reproductions or extensions.

There have been many attempts to produce simulations of a wide variety of scientific concepts, and it is well beyond the scope of this review to provide a lengthy description of each, but I will make the observation that most attempts at simulations are very limited in concept and are designed primarily to target specific lessons in a prescriptive manner. Indeed, this is the primary reason why most experts in the educational community dismiss virtual laboratories out of hand. For the most part, simulations available online are narrowly focused within a simple 2D interface, and students have essentially no freedom to design and construct experiments, make choices, and experience real-world consequences. The number of highly realistic and sophisticated 3D virtual environments is quite small, primarily due to the effort and cost associated with the production of the art and simulation engine necessary to support such an environment. Some of those that I am familiar with include [Geology Explorer](#) and [Virtual Cell](#) from the North Dakota State University, [Late Nite Labs](#) (a chemistry laboratory) produced in Israel, and [Model ChemLab](#). There are other virtual laboratories, some conceived and produced by commercial publishers and others that are no longer supported and are now obsolete.

In the interest of transparency, I am the author and project director for a set of virtual laboratories called [Y Science Laboratories](#), which have been produced at Brigham Young University since 1998 and are licensed to and distributed by Pearson Education. These laboratories currently include the general products Virtual ChemLab, Virtual Physics, Virtual Physical Science, and now Virtual Biology. Within these programs, lab benches have been created for inorganic qualitative analysis, calorimetry, titrations, gas properties, experiments in quantum chemistry, mechanics, density, circuits, optics, microscopy, genetics, molecular biology, ecology, and systematics. These simulations are built around a realistic 3D interface that allows students to move about in a laboratory and to perform a wide variety of experiments with a nearly unlimited number of outcomes. The focus of the labs is not necessarily laboratory technique (although that is certainly included whenever possible), but rather experiment design, data gathering and recording, data interpretation and analysis, and, most importantly, dealing with an unstructured laboratory environment. If experiments are not set up properly, students can experience explosions, failed experiments, “wrong” or unanticipated results, and null data. The laboratories look and feel like a real-world laboratory; there are no built-in instructions or guidance. The rooms and lab benches are constructed to look like real rooms with real equipment, and the goals

and learning outcomes for students are expected to be supplied by the instructors as they would be in an actual laboratory setting. Indeed, the programs provide a virtual rendering of a residential laboratory setting with lab benches, drawers containing equipment, stockrooms with necessary supplies, and lab books for recording observations, data, and results. Research and anecdotal evidence show that students perform better on lab exams and in the laboratory when these virtual laboratories are combined with actual laboratory work (Woodfield et al., 2004; Woodfield et al., 2005; Swan, 2008).

## Conclusions

*Accessible Elements* provides the first comprehensive look at what is needed to produce a DE science course. The book provides a snapshot of the theory of learning behind these courses, describes what is needed to provide laboratory experiences through home kits, residential labs, and remote labs, and concludes with discussions on the administrative logistics of delivering these courses. The book is useful for those currently involved or interested in producing an online science course and provides meaningful experiences, research, and information. A serious weakness of the book, however, is the exclusion of any meaningful discussion of virtual labs and how they could be used to enhance the laboratory component of any online science course.

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## ***Book Review***

### ***Mega-Schools, Technology and Teachers: Achieving Education for All***

**Author:** John S. Daniel (2010). **Mega-Schools, Technology and Teachers: Achieving Education for All.** London & New York: Routledge. 186 pages. ISBN: 978-0-415-87205-8.

**Reviewer:** Alejandro Pisanty, Facultad de Química, Universidad Nacional Autónoma de México, Centro de Investigación en Geografía y Geomática “Jorge L. Tamayo”, A.C., CentroGeo

There is hardly a bugle call that stirs educators more actively than “education for all.” It works well as a catchphrase, fits nicely in politicians’ speeches as a lofty goal, and, for those closer to actual planning and execution of educational programs, signals the failure, difficulties, and challenges of achieving full coverage of the entire population with adequate or better educational services.

Sir John Daniel has made a new contribution to educators with a book on the plans, actions, technology, and methods by which humankind has a hope of achieving the goal of providing education for all.

*Education for all* in Daniel’s book is the name of a broad set of international programs. It has emerged from high-level meetings of government officials, particularly representatives of education authorities.

The goal of education for all is described in a summary of a meeting in Dakar in 2005. Simply stated, by 2015 the following will be achieved: expansion of early childhood care and education; all children in schools, emphatically including girls, ethnic minorities, and other vulnerable groups; 50% increase in adult literacy, especially in women; equitable access to satisfy learning needs; elimination of gender disparity in education; and improved quality through measurable outcomes, especially in literacy, numeracy, and essential life skills.

That is John Daniel’s starting point. He gives us a book that is compassionate as well as passionate. He makes a rational assessment of progress towards those goals and forces us to think about how to achieve them. I am a witness to his collection of evidence and its validity, which is based on intensive questioning and extensive research and cross-checking.



Sir John believes that education for all can be achieved by combining technology, private education for the poor, and a rethinking of educational goals, programs, contents, and methods, particularly in the area of teacher in-service training.

He is acutely aware of the challenges of increasing the scale of applying even simple ideas to large numbers of students and teachers, particularly those in poverty, in isolated regions, and in vulnerable minorities. This perspective is one of the highlights of the book; much literature and debate emphasize pedagogical approaches, the workings of the classroom, and many other valuable angles but overlook the challenges associated with transforming those approaches into viable, massive, fast-acting programs.

Chapter 1 of the book reviews the education for all programs and experiences. Sir John traces the history of the World Bank's views on education and, in particular, the Bank's *volte face* on the need for decisive state interventions. The Bank extracted eight lessons from the experiences of approximately 2,000 Bank-related institutions during the previous decade. They are listed as conditions for achieving country-wide education for all:

- Political commitment,
- A focus on quality in education,
- Partnerships with families and civil society,
- Comprehensive sector policy frameworks,
- Efficient resource allocation, including learning materials and in-service teacher training,
- Adaptability,
- Cushioning education during economic and political crises,
- Growing economy.

The goal of education for all must now include additional goals of expansion of secondary schooling, encouragement of lifelong learning, and reduction of inequality.

Chapter 2 contains an updated summary of problems and approaches to solutions. It highlights some troubles of public schooling, again especially in developing regions (many of which are also experienced in developed countries), particularly teacher absenteeism and the social distance between schools and teachers on one side and students, families, and civil society on the other.

Sir John stresses the growth of private education for the poor in many countries. This growth is fueled by many factors. Readers are challenged to reconsider widespread views about the low quality and the lack of control over these schools in exchange for appreciating what good they can provide (from an accessible payment schedule to an immediately useful education).

Daniel then reviews recent approaches to applying technology in schools, including the "One Laptop per Child" initiative, its many changes over the years, and the beginnings of successful applications, such as the one taking place in Uruguay. Further, he contrasts large-scale, system-wide, top-down government driven programs with others such as the "Hole in the Wall" approach

undertaken in India, in which spontaneous, highly decentralized actions leave, to astounding effect, many decisions to the children themselves.

Chapter 3 focuses attention on technology. Daniel presents a simplistic approach, taken almost naïvely from Adam Smith; this simplicity serves the purpose of a direct explanation. The author takes us to the heart of the problems of scale and the conditions for solving them. Citing the economics of educational systems, Daniel provides a clear explanation of the division of labor between those who develop systems for learning and the teachers who apply them.

We thus enter chapter 4 armed with a set of tools to analyze and criticize existing systems and, hopefully, to build new and more effective systems. Drawing on Daniel's thinking, this chapter offers a definition of mega-schools and open schools. Mega-schools share with open and distance learning (ODL) such parallels as enhanced presence of private institutions, autonomy, and intensive, differentiated use of online technology.

After a walk through the complementary, alternative, and integrative modes of education in mega- and open schools, Daniel describes collaborative creation of learning materials. He then advocates the use of open, distance, and technology-based education to strengthen conventional education, catalyze reform, and expand the use of ICTs in society in general. Governance of open schools is left for further consideration by the reader.

Chapter 5 considers the challenges of increasing the scale of teacher education. A particularly nagging problem, this is the Achilles' heel of many a failed education program. The history of education worldwide is littered by programs that have failed, particularly those programs intended to equip teachers with the skills needed to enable students to increase their technical competence, which they typically possess at a higher level than the teachers themselves.

Chapter 6 brings together the strands developed in order to consider synergies, systems, and strategies. Local learning, resource centers, technology, legislation, policy, governance, leadership, management and administration are all considered, as is international assistance.

The appendices are no less substantial than the book; they provide valuable, concrete information about specific mega- and open schools, programs, and mechanisms for expanding teacher supply, and many other valuable insights.

The book's excellent organization makes it easy to use for different purposes. Each information-rich chapter concludes with a clear, practical summary. The cases presented provide numerous examples of how the ideas discussed have been applied in practice. It is disciplined and methodical. The urgency of the call should not be missed. We are too close to 2015 and too far from achieving the goal; there is no room for complacency.

Thus, Sir John Daniel has provided us with a masterpiece. It will fuel our emotions and commitment, allow us to make sober assessments of the challenges faced by educational systems, and provide us with tools and stepping stones for building new and more effective educational

systems. Rarely has stepping on the shoulder of giants been facilitated by such a high-speed elevator as this book.

