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Donald G. Perrin, Executive Editor

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Editorial

A Benchmark for Learning

Donald Perrin

Traditional evaluation assigns students into categories A, B, C, D and F. These “relative” grades are based on a bell shaped curve – the same curve used to express the Intelligence Quotient (IQ). Use of multiple-choice and similar “objective” test instruments enable performance to be measured as numbers and converted to letter grades. For greater precision, letter grades can be assigned a + or – .

Blooms Taxonomy of Behavioral Objectives enables us to define learning outcomes and conditions under which performance is measured. It also differentiates between knowledge, skills, and affective behaviors. For half a century teachers have wrestled with these concepts. Many teachers found these difficult implement and relegated the taxonomies to designers of curriculum and instruction. Subsequently there were efforts to define a “standards based” curriculum and use rubrics to determine progress.

Quality of teaching is derived from student and peer evaluations. Such measurements are biased by language and cultural factors, and express more about how well the course or instructor is liked than what was taught or learned.

Standardized tests have been corrupted by teaching-the-test, and even teaching *answers* to the test. So long as there are high stakes for top scores, there will be cheating by both students and teachers. Competition for high scores is narrowing the curriculum to tested items so students learn more and more about less and less.

If education is preparation for life in the future, it should focus on life skills and knowledge that is relevant. This is not to deny the value of a classical education, but to place education into a practical framework where curiosity, exploration, history, literature, theory, measurement, problem solving, creativity, aesthetics and ethics have their logical place. It also suggests benchmarks rather than grades for core curriculum and electives.

In industry, quality control ensures every product meets or exceeds specifications. Imagine buying an automobile constructed by educators. Depending on which students were assigned, a factory assembled automobile might a B engine, C brakes, and D safety features. Who would buy such a car? So why do we accept this in education?

Instead of giving every student the same education, measuring the result, and sending the student forward, educators should persevere until the required learning (benchmark) is achieved. Instead of time (identical treatment) being constant and learning a variable, we must make learning a constant. With modern prescriptive and diagnostic tools and individualized methods of instruction, the basic learning experience can be customized for different learner needs. This does not require additional instructors, it requires learning technologies that set the teacher free for small group and one-to-one tutorials and learning experiences. These concepts require teachers to be trained in learner centered learning to gain mastery in the newer teaching-learning paradigms.

Many institutions are adopting computer management and interactive media to enhance the overall quality of instruction – and learning. These distance learning tools are often adopted for on-campus instruction as their value becomes evident. But we are stuck with the traditional evaluation instruments and standardized tests that are tied to a set of standards for a world that no longer exists. As we implement new learning technologies we must evaluate performance criteria and relevance. Every student must reach the desired standard. The question is how to adequately give credit to students who exceed all expectations in terms of performance and problem solving abilities. Genius demands respect, but education must serve everyone.

Editor's Note: This paper studies group dynamics in synchronous online discussions. In particular, it is seeking data to inform instructors how best to guide the online dialog. Data provided in this study will stimulate research to better understand how to optimize the results of online dialog in different disciplines, in different contexts, and for different levels of learners.

Getting in Sync with Synchronous: The Dynamics of Synchronous Facilitation in Online Discussions

Shufang Shi, Curtis Bonk, Sophia Tan, Punya Mishra

Abstract

The goal of the study was to develop a deeper understanding of the relationship between teacher moderating and student engagement. The primary data source for the study was 44 transcripts collected from 4 groups of college students over 11 weeks of conferences in a moderated synchronous online course taught in a Canadian university. The study applied mixed method approach and this paper reports the results of the qualitative analysis. Through a descriptive discourse analysis of synchronous computer mediated discussions, the study provides a picture of the interaction processes of synchronous online discussion. The themes emerging from the qualitative analysis, together with the supporting theories and practices, uncover the underlying processes of synchronous computer conferencing in relation to online moderating. This research also informs both research and practice related to the larger goal of improving the quality of online teaching and learning.

Keywords: synchronous online discussion; moderating skills; student engagement; qualitative analysis; transcript analysis.

Introduction

Current theories of learning emphasize the value of dialogue for student engagement and achievement (Bruffee, 1993, 1999; Cazden, 2001). Researchers argue that learning and working with a small group, as opposed to individual activity, may facilitate learning (Anderson, 2006; Bruffee, 1999; Zhang, 2004). Research has also shown that the nature of classroom discourse depends greatly on the teacher (Anderson & Christiansen, 2007; Anderson, Rourke, Garrison & Archer, 2001).

In face-to-face classrooms, these issues are relatively well understood. However, perceptions of group learning dynamics and online teachers' roles in distance education environments remain quite varied and controversial (Lobel, Neubauer, & Swedburg, 2002a; Park & Bonk, in press; Pfiser & Muhlpfordt, 2002). For instance, although online instruction literature increasingly emphasizes the importance of moderation and leadership (Anderson, 2006; Anderson et al., 2001), the relationship between moderation and student engagement is often unclear.

Computer conferencing is an important part of online learning. Current instructional applications of technology provide two distinct formats of computer conferencing: (1) asynchronous and (2) synchronous (Hines & Pearl, 2004). Asynchronous computer conferencing refers to electronic bulletin boards, discussion boards, or electronic mail that participants can access at any time. "Synchronous computer conferencing" in this study refers to "real time" interaction programs through which participants communicate or "chat" at the same time.

The adoption of computer conferencing in higher education has far outpaced our understanding and knowledge of it (Garrison, Anderson & Archer, 2001; Park & Bonk, 2007). Despite the promise of computer conferencing for creating powerful learning spaces and the fact that this

technology has been widely adopted, many questions and issues remain (Herring, 2003; Johnson, 2006; 2006; Park & Bonk, 2007.).

This lack of knowledge is even more pronounced in the case of synchronous computer conferencing learning environments since most research on distance education has focused on asynchronous systems (Park & Bonk, in press; Shi, Mishra, Bonk, Tan, & Zhao, 2006). Nevertheless, the contextual aspects of learning - real-time social interaction and negotiation with peers, experts, moderators, and instructors - are vital to a student's movement from novice or legitimate peripheral participant to eventual contributor or expert (Bonk, Wisher & Nigrelli, 2006; Lave & Wenger, 1991; Orvis, Wisher, Bonk, & Olson, 2002). There are many recent research results from the social presence and online learning community literature that indicate that online students in higher education want and expect more direct and timely interactions with instructors and other students (Bonk, Wisher, & Nigrelli, 2006; Melrose & Bergeron, 2006). As learners begin to demand more synchronous opportunities, research on synchronous conferencing is needed to inform how, when, and where to embed real-time virtual learning experiences. Of great interest is better understanding of how instructors manage the ebb and flow of classroom discussion.

Purpose of the Study

Given the above context and definitions, this project addressed three key issues:

- The need to better understand the nature and dynamics of moderated synchronous group discussion;
- The need to understand and identify the role of teacher moderators through engaged collaborative discourse in enhancing student engagement and learning; and,
- The need to identify good practices in facilitating synchronous group discussion.

Scholars have identified ways in which computer conferencing can support collaborative discourse and student learning. However, there is minimal theory-based and data-driven research in the area of synchronous online instruction and facilitation. Researchers have put forward myriad lists of moderating skills and techniques, but most of these are highly experiential and anecdotal, instead of empirically driven and validated. Moreover, most of the skills mentioned in these reports are drawn from experiences related to asynchronous learning environments; few are relevant to synchronous learning environments. Even fewer discuss effective synchronous moderation practices based on systematic observation (and comparison between good and not so good moderating practices). Understanding the nature and dynamics of moderated synchronous group discussion is vital for better understanding of the respective roles that teachers and group dynamics play in student engagement in learning.

The third goal of this study was to identify effective practices in facilitating synchronous group discussion. Hopefully, efforts in this area will lead to the formation a model of teaching and learning through engaged collaborative discourse in synchronous computer conferencing. By building such a model, relationships between teacher moderating behaviors and student engagement as well as relationships among student engagement aspects may be disentangled, potentially revealing major factors critical to student learning.

This research project was designed to address the above issues within the context of an online college level course that was based completely on text-based synchronous computer conferencing. This course used a custom-built software system to develop structured discussions around topics under the guidance of teacher moderators. The major purpose of the study was to investigate what role teacher moderators play in enhancing student engagement through

collaborative discourse, and, specifically, *how* moderating functions worked in terms of the collaborative meaning construction processes in synchronous computer mediated discussion.

Project Significance

As indicated earlier, researchers have put forward numerous lists related to moderating skills and techniques, but those generally lack validation. In addition, most of their work entails asynchronous learning not synchronous. Simply put, there are many significant gaps in the literature on synchronous instruction. As online learning continues to grow across educational sectors, such gaps are increasingly salient.

One of the most significant gaps in prevailing knowledge about the use of computer conferencing for learning concerns the relationships between individual thinking processes and group interactions. For instance, while discussing discourse in classrooms, Cazden (2001) writes, “it is never easy to talk about relationships between individual (silent) thinking process and the dyadic or group (often noisy) interactions in the classroom.” However, this relationship between individual cognition and group interaction lies at the heart of student learning (Cazden, 2001) and is particularly important if the potential of computer-mediated communication is to be achieved.

Research related to the underlying processes of synchronous computer conferencing vis-à-vis online moderating contributes to a better understanding of how teachers can provide effective online mentoring and scaffolding to facilitate collaborative student engagement, both in a social sense and with subject matter (Park & Bonk, 2007, in press). While the work of Park and Bonk (2007) focuses on guidelines for instructors in synchronous environments for student critical inquiry, research in online moderating in this area might also contribute to a better understanding of whether and how a community of inquiry develops by means of synchronous computer conferencing where students are most likely to become invested behaviorally, social-emotionally, and intellectually. Findings from such research should inform research and practice related to improving the quality of online teaching and learning.

Theoretical Perspectives

This research draws upon multiple research perspectives. The pertinent literature related to socio-cultural learning theory, characteristics of synchronous computer conferencing, online moderating, student engagement, and their relationships.

Socio-cultural Learning Theory

This project, situated within a Vygotskian, or socio-cultural framework (Vygotsky, 1978, 1986; Wertsch, 1985), studied computer conferencing as a medium for providing scaffolded feedback from multiple sources and perspectives (Bonk & Dennen, 2003). It also draws upon the cognitive apprenticeship model espoused by Collins, Brown, and Newman (1989).

An important concept in Vygotsky’s theory is his idea that intellectual development takes place between people before being internalized. From this point of view, instruction is more effective when it takes form in discussions or dialogues in small groups wherein learners interact with peers and adults or mentors who challenge, support, and scaffold their learning (Veerman, Andriessen, & Kanselaar, 2000).

Cognitive apprenticeship (Collins et al., 1989) emphasizes the solution of real world problem-solving under expert guidance that fosters cognitive and metacognitive skills and processes. The notion of guided experience in cognitive apprenticeship corresponds to the concept of guidance and collaboration in the zone of proximal development (ZPD) introduced by Vygotsky (1978).

Exposure to the strategies, skills, and ideas of others on a social plane can be individually appropriated and internalized as independent problem solving skills. The implication for online instructors and instructional designers is that, to learn better, learners have to be situated in the social and functional context embedded with the learning skills and knowledge (Bonk & Reynolds, 1997; Shi, 2005). Synchronous computer conferencing can provide such a context - as this discussion will clarify. The nature of collaborative discourse in synchronous computer conferencing is framed within the basic characteristics of the medium, including its affordances and constraints (Tu, 2003).

Characteristics of Synchronous Computer Conferencing

As noted, there are two modes of computer-mediated communication: asynchronous and synchronous. Some research has focused on the use of synchronous computer conferencing as a Web-based communication system that supports real-time, many-to-many textual interactions. The interactions made possible through synchronous communication technologies allow participants to experience “same-time, same place” or “same-time, any place” collaboration. Such types of collaboration demonstrate the important traits of immediacy, fast planning, problem-solving, scheduling, and decision-making, which can be difficult to replicate in an asynchronous environment (Knolle, 2002; Marjanovic, 1999).

The ways in which we communicate face-to-face are reconstituted when we move online. The pure textual nature of computer-mediated conferencing constrains interaction in some ways. Not all aspects of meaning that are communicated via speech in face-to-face conversations can be represented in online environments, whether it be videoconferencing, video streaming, synchronous chats, or audio conferences; each has respective limitations. As a result, attempts to represent meaning in writing as in a text chat may not fully represent what one has intended to say. Much paralinguistic information is conveyed in speech and face-to-face situations that are difficult to display with writing alone - e.g., leadership, reluctance, disagreement, and so forth.

Although scholars have researched the means by which groups accomplish this orally (and in the writing accompanying oral communication, e.g. Florio-Ruane & deTar, 2001; John-Steiner, 2000), numerous questions remain related to how this is accomplished and interpreted by people working exclusively on written communication via the computer, and especially within synchronous written communication (diSessa, 2001; Wang & Chen, 2007). The sound, tone, and tempo of a speech and the non-verbal expression of a face-to-face conversation is often lost, or at the very least, extremely difficult to interpret, in computer conferencing. This narrowed communication channel challenges participants; as a result, successful communication in such an environment requires conscious effort and skilled coordination and collaboration. Such challenges lead to the issue of online moderation and its role in online discussions.

Online Moderating

To moderate is to preside or to lead (Feenberg, 1989; Paulsen, 1995). Drawn on the idea of discussion as language games (Wiittgensein, 1958), moderating functions play an important role in keeping participants absorbed in the ongoing dialogue “game.” *Playing* at computer conferencing consists of making moves that keep others playing (Xin, 2002). In this way, computer conferencing favors open-ended comments, and this calls for a moderator who provokes and instigates in order to keep the game alive. When a message fails to function as a link, at one end or the other, moderating functions (e.g., recognition, prompting, weaving, etc.) are needed to tie up the loose ends and strengthen the link in order to keep the chain of conversation going (Xin, 2002). While individual learning can occur through independent or self-directed study, it is only through active intervention of a teacher or moderator that a powerful communication tool, such as collaborative computer conferencing, becomes a useful instructional and learning resource (Anderson, 2006; Garrison, Anderson, & Anderson, 2001; Paulsen, 1995).

According to Winograd (2006), an online moderator wears many hats, including lecturer, tutor, facilitator, mentor, assistant, provocateur, observer, host, and participant. A moderator is a generalist who is sensitive to the individual needs as well as the dynamics that make up the conference. Through this sensitivity, a moderator can grasp when a conference is doing well or poorly and deciding on action to take if a conference is going awry (Winograd, 2006). Obviously, a moderator needs to know when to wear which hat and how to perform the role accordingly. Fortunately, there is increasing literature discussing the role of the online moderator (Bonk & Dennen, 2003; Pfister & Muhlport, 2002; Wang & Chen, 2007), moderating functions (Winograd, 2006), and online teaching presence (Anderson et al. 2001).

One of the most important functions moderators play in online discussions (and such is the case in this study as well) is that of the subject matter expert (Anderson, 2006). Thus, the moderator is expected to provide both direct and indirect instruction by interjecting comments, referring students to information resources, and organizing activities that allow the students to construct the content in their own minds and personal contexts. For instance, in this study, although the conferences were all structured - with pre-specified syllabi and agenda - the moderator played a critical role in ensuring that students were learning the material. This is clearly a difficult task, requiring the balancing of time pressure in monitoring and responding to a plethora of ideas and comments, while capturing one's thoughts about subject matter and ideas in fairly pithy and understandable postings. Clearly it is important for research to provide guidance to moderators through analysis of effective moderating behaviors in order to catalog, capture, and describe best practices that can inform future practice.

Student Engagement

All learning requires engagement to attain mastery (Bloom, 1956; Carroll, 1963). Based on Bloom's well-cited taxonomy of educational objectives, student engagement in a learning process entails three key factors: (1) cognitive, (2) affective, and (3) psychomotor (Bloom, 1956). Such a threefold division is as ancient as Greek philosophy: philosophers. In fact, psychologists have repeatedly used similar tripartite organizations such as cognition, conation, and feeling as well as thinking, willing, and acting (Krathwohl, Bloom, & Masia, 1964). In his seminal article "learning community," Schwab (1975) argued that fruitful conversation requires three kinds of community: (1) community of confidence and trust, (2) affective community, and (3) cognitive community.

There must be community of confidence and (cautious) trust, which arises from the past collaboration in which the usefulness of each to other, and a degree of dependability, have been discovered. There must be affective community, which arises from shared vicissitudes and satisfactions. There must be a cognitive community (p. 39).

Online conferencing similarly requires engagement to reach ideal educational objectives; synchronous online communication has the potential to engage students in knowledge sharing, mutual inspiration, interdependence, and active learning through conversation, argument, debate, and discussion among peers, experts, and teachers or moderators (Bonk & Cunningham, 1998; Kaye, 1992; Park & Bonk, 2007). As Kaye (1992) has stated, the practical reality of collaboration is that it requires a higher order of involvement or engagement (Schrage, 1990). However, there is a need for more research into the nature of engagement online as well as the activities and contextual features of an engaging online curriculum. Engagement in this particular study is synonymous with investment, involvement, or commitment.

Summary

The relationship between online moderating and student engagement in a synchronous computer conferencing learning environment is complicated. It may be easy to assume that there is a direct

causal relationship between moderator behavior and student engagement (i.e., the nature of moderator behavior determines the level of student engagement). Nevertheless, while some theorists in this area argue for strong moderating intervention (Bonk, Wisner, & Lee, 2003; Salmon, 2000), many others believe that self-direction on the part of students is more important.

Approaches at the extremes of either position overlook the dynamic nature of student-instructor interaction in synchronous computer conferences. In an educational context, the development of shared understanding is a complex process mediated by the prior knowledge of the students, their interaction and engagement with each other, the subject matter, and the moves made by the instructor. The development of dialogue, where newer messages build on earlier messages, can be one indicator of the manner in which shared understandings are constructed by the instructor and the students. Given this fact, the instructor has a relatively privileged position in the classroom, and this holds true in virtual classrooms as it does in more conventional face-to-face classrooms. Thus, the shared construction of knowledge in a virtual classroom can be strongly influenced by the role taken by the instructor. As a result, the relationship between teacher moderating levels and student engagement variables in synchronous computer conferencing is complex and dynamic where changes in one variable may influence most or all of the others.

The complexity of the phenomena has significant implications for the design of any research related to them. It is for this reason that the researchers developed a mixed-methods research design, including both quantitative and qualitative components. With the guidance of quantitative results (Shi, 2005), we choose cases of interest and applied fine-grained qualitative analyses. The qualitative approach is aimed at understanding and clarifying the dynamics of interaction between the students and the instructor. This approach pays close attention to the content of what is discussed and the intricate give-and-take that characterizes the relationship between moderating behavior and student engagement in a synchronous computer conferencing learning environment.

Research Context and Data Collection

The research was conducted within a synchronously-taught, three-credit university level undergraduate course entitled “Interpersonal Communications and Relationships.” This online course was designed to enhance students’ understanding of effective communication behavior and to improve their abilities to attend to verbal and non-verbal communication with others, exchange constructive feedback, engage in effective problem-solving, address and deal constructively with conflict, and communicate across such differences as gender, class, and race (Lobel, et al., 2002a). In each class session, small “breakout rooms” were used for group discussion that followed a highly detailed agenda.

This course was delivered online, in real time, to 32 students during a regular semester. The course consisted of eleven consecutive three-hour weekly sessions. The medium - a synchronous, online eClassroom available over the Internet and designed specifically for experiential “learning-by-doing” pedagogy - used a real-time, interactive HTML-formatted text, image, and animated messaging system. The eClassroom, consisting of a main “room” and four “breakout rooms” for small eGroup experiential eActivities and eDiscussions, was password-protected, monitored, and archived. Most students logged into the eClassroom from their homes. Text- and image-based lecture materials were posted to the eClassroom in real time. The “LearningByDoing” eGroup activities offered in this medium facilitated learning through practice and discussions (Lobel et al., 2002b).

One principal instructor and three eGroup co-facilitators/moderators staffed the eClassroom. The virtual classroom consisted of a public main “room” where the whole class met to receive the course content for the first part of the session. When each content delivery session ended, students broke up into groups and attended one of the four “breakout rooms” for small online

group activities and discussions for the second-class session, which usually lasted for about an hour. The 32 student participants in the course were randomly divided into four discussion groups at the beginning of the semester. Each small group had a discussion moderator. Importantly, this arrangement remained unchanged for the entire semester (11 weeks).

Students wrote weekly eJournals, which served as an asynchronous component of the eCourse, and these were e-mailed weekly to their eGroup co-facilitator and principal instructor for comments on learning progress. All eClassroom activities and interactions took place online, in real-time. There were no face-to-face interactions between the students and the instructors during the 11 weeks of the eCourse (Lobel et al., 2002a).

The prime data source for this study consisted of 44 automatically archived conference transcripts from an online course, each with an average of 350 postings. In order to better understand the context within which these discussions worked and to help triangulate research results (Patton, 2002), additional sources of data were collected, including field notes taken by the researcher through participant observation as well as other class materials such as the course syllabus, the course readings, classroom activity agendas, and all of the course assignments. Such data help to define the context of each synchronous conference.

Research Design and Data Analysis

To accomplish the intended goals, mentioned above, this research applied a mixed method approach to examine the transcripts generated by moderated synchronous discussions of four groups of students over 11 weeks of an online course. By means of quantitative analyses, we explored relationships between teacher moderating levels and student engagement variables and relationships among student engagement variables as they developed over time (Shi, 2005). The broad patterns resulting from the quantitative analyses allowed the selection of sections of transcripts of interest for qualitative analyses. The qualitative analyses provided a closer look at the nature of the “lived” experience of conferencing, the process of collaborative meaning construction, and the transactional nature of the relationship between teacher moderating and student engagement. Derived from the qualitative analysis is the identification of the “good moderating practices” in facilitating synchronous group discussion as well as various themes related to effective moderating strategies.

The qualitative analysis process consisted of four phases. The first phase took place before the computer conferencing sessions started. The researchers identified the central parameters underpinning the conferences such as the background information, class objectives, and approaches to moderation (Duemer, et al. 2002; Cook & Ralston, 2003; Mullen & Tallent-Runnels, 2006). These data provided a broader context for the transcripts in our analyses.

The second phase occurred during the synchronous computer sessions. During this phase of the study, the first author was a participant observer of the synchronous online discussion sessions. Field notes were taken during the observation. At the end of each class session, the first author made summary reflection notes.

The third phase of the qualitative analysis took place during the coding process for the quantitative analysis. Because the coding process involved careful scrutiny and decision-making about which category each posting would be coded and assigned, the first author utilized the process and made hundreds of memo-related pages. These memos included impressions and perceptions of each conference. From these memos, some perceptions and loosely defined themes emerged.

The fourth phase of qualitative analysis was an intensely purposeful analysis of the transcripts selected based on the quantitative analysis results using computer-mediated discourse analysis, a

widely used approach for researching online interactive behavior (Herring, 2003). These qualitative analyses explored the methods of moderating used in the conference as well as the effect of the moderating on the patterns of the electronic discussions and knowledge construction (Cook & Ralston, 2003; Shi, Mishra, Bonk, Tan, & Zhao, 2006). The basic goal of such discourse analysis is to identify patterns in online discourse that are demonstrably present, but that may not be immediately obvious to the casual observer or to the discourse participants themselves. In this particular study, the discourse analysis helped identify emergent patterns and themes that were related to teacher moderating behaviors and student intellectual engagement. Phase Four of the data analysis was an iterative process of refining the loosely defined themes that emerged from phase three. During Phase Four, transcripts that illustrated similar ideas or purposes were organized and classified together, until five different themes emerged. These themes as well as the practices of the moderators are described in the following section.

Results

During the process of the analyses, themes of effective moderating strategies emerged and these themes were labeled “good moderating practices.” The themes were organized into five major categories and each theme will be presented in a three-part format: (1) the theme - the structuring and moderating efforts that were actually provided by the instructors during the course of the online collaboration; (2) theories that underpin the theme; and (3) supporting examples followed by a brief discussion related to how these efforts may have impacted the subsequent discussion. The five themes are as follows:

- Providing hooks with both ends;
- Modeling and tele-mentoring;
- Confronting and conflicting;
- Setting up norms; and,
- Social-emotional elements.

While the above themes do not represent an exhaustive list of moderating functions, they do serve to highlight some observations of good moderating practices and how they affected the meaning construction process where different learning scenarios unfolded.

In the presentation of the example excerpts, the format of all the postings was preserved as originally posted - grammatical errors, inaccurate use of mechanics, punctuations, with the purpose to retain the nature of synchronous online conferencing. But some characteristics that were digital (e.g., pictures, emoticons, and flash applets) were not preserved due to space limitations as well as other technical barriers. Finally, all participant names were changed to protect the rights of human subjects.

Providing Hooks with Both Ends

Online learning researchers such as Feenberg (1989) use sports and language games as a metaphor to illustrate the satisfaction of playing an engaged dialogue game. “Play” at online discussion consists of making moves that keep others playing. Therefore, to sustain the dialogue game, every message fulfils a double goal: (1) communicating something, and (2) evoking future responses (Feenberg & Xin, 2002). In this vein, each message functions as a link that at one end connects to one or multiple previous messages, and, at the other end, provides a hook for creating future message(s) (Xin, 2002).

In the examples below, the researchers will review moderating postings with hooks, postings without hooks, or postings with hooks that had only one end - postings that either only solicited

without providing context or related materials, or only summed up previous messages. Presentation of both positive and negative examples allows for inspection of the effect of postings with or without hooks.

Example 1 Moderating by Postings with Hooks on Both Ends

#678

Amy (Oct 27 9:41pm):

so we agree that there were no differences in wanting to be good and fun people
the differences are in how we go about this

so

What do you see are the implications of these differences?

The topic of this class was the Myers Briggs Personality Type preference (MBTI), and how one's own MBTI personality type preference can affect interpersonal relationships. In the postings prior to this excerpt, students talked about the differences of the personality types. It is important to note that this particular thread was fairly extensive with about ten messages. At this point, the moderator (i.e., Amy) posted a message that not only strongly weaved what was discussed in previous messages but also provided a hook for future messages.

However, providing a hook did not always activate discussion on the topic. After the message was posted, it was perhaps not processed well or interpreted properly, and the topic “implications of these differences” failed to become fully developed. One possible reason was that these students might have had difficulties processing this question. Therefore, the moderator used an example to interpret the question, shown in Example 2.

Example 2: Moderating by Posting with Hooks

#693

Amy (Oct 27 9:44pm):

what if your parents are big time organized people
and your style is to go with the flow
what are the implications of these preferences for you

After this particular posting, the discussion was developed but not as much as might be expected because the discussion was drawing to an end, and, not surprisingly, students could not stay well focused.

It is also helpful to review moderating postings without hooks, or postings with hooks that had only one end - postings that either only solicited without providing context or related materials, or only summed up previous messages. What effects did such postings produce?

Example 3: Moderator Postings with Hooks on Only One End

#207

Jodi (Nov 3 8:11pm) :

Marie: #197 What would you need to get the same feeling in a f2f class?

Renee: What is the meaning of your message-4?

#215

Jodi (Nov 3 8:12pm) :

Renee: Can you articulate more?

#219

Jodi (Nov 3 8:13pm) :

Arlene: #216 Why do you think that is?

The topic of discussion in Example 3 was students' feelings about the absence of moderators. In the postings prior to this excerpt, students talked about their feelings. The moderator in this group posted messages without hooks, with hooks that were extremely flat and weak, or hooks that had only one end that functioned as "soliciting without providing context and related materials." Furthermore, using serial numbers of postings as a reference did not work well because the flow of the messages was so quick that it was not convenient or practical for students to scroll back and forth to address a moderator's question. The effects of these postings were not obvious. Post #207 was not addressed at all nor was post #215, while post #219 was picked up but without deep reflection. Here are more examples of hooks with only one end.

Example 4: Moderator Postings with Hooks on Only One End

#283

Lindsey (Nov 3 8:27pm):

Joyce: that is a great observation... "So I think people have underestimated their skills. I believe this group would average a 4 in most of those questions"

Moderator Lindsey in example 4 summarized without suggesting next steps. Postings like these were "flat"- they did not weave with other postings or provoke further discussion – and, consequently, they failed to produce additional discussion. In the end, this posting activated no further responses.

Finally, we could observe in Example 5 how Moderator Amy strongly weaved with and wrapped up Discussion.

Example 5: Moderator Postings That Strongly Weaved and Wrapped up Discussion

#288

Amy (Oct 20 10:05pm):

ok

i'm aware of the time

just want to say how impressed i am again with this group

we did a bunch of totally new and bewildering activities

used the whiteboard, filled in questionnaires, without java and so on

and you were all troopers

i feel so proud for all of you

and i want to thank you for being so open and accepting, as i remind you

that we are all learning here, as we keep pushing that envelope

i bow to each of you

#18

Amy (Sep 15 9:32pm)

so

i have a question

what do we each need to have to feel like we belong in this group?

In post #288, Amy strongly weaved and wrapped up the whole discuss with a pleasant conclusion wherein she praised the participants. In post #18, when the discussion went deep enough and the

current thread ran out of energy, Amy added new directions for the discussion. She provided a hook with both ends, this time, putting more weight on the end that intended to elicit future responses-“I have a question ...?” Amy here actually articulated the major question/objective of the whole discussion. Amy posted this question after the “inclusion” topic was discussed thoroughly, which was timely and fortuitous. What’s more, she made the question relate to the present online experience of her group by stating, “what do we each need to have to feel like we belong in this group?”

This question activated several other rounds of extremely heated and lively discussion. With Amy using different moderating strategies skillfully, students stayed well on-task and produced sharp and deep reflections, together with informal banter and elements of humor as lubricants. All of these elements are reflective of students being engaged behaviorally, social-emotionally, and intellectually.

Modeling and Tele-mentoring

As a relatively new learning method, online collaboration itself is a learning process that needs scaffolding from capable experts to smooth the process as well as to guide the content learning to achieve smooth, effective online collaborative learning (Zhang, 2004). Instructors are expected to provide supports in the collaborative learning process by motivating students, monitoring and regulating performance, and providing reflections, modeling, moderation, and scaffolding (Brown & Palinscar, 1989; Mullen & Tallent-Runnels, 2006; Zhang, 2004).

Vygotsky proposed that learning occurs in social activities (Vygotsky, 1978), and that complex, higher-order thinking gradually develops through social interactions with others in the culture (Gredler, 1997; Vygotsky, 1978). According to socio-cultural theorists, people learn from mediations and scaffoldings, which are offered within one’s zone of proximal development (ZPD) from experts or more capable peers (Bonk & Cunningham, 1998; Gredler, 1997; Wertsch, 1985). Such a distance can be bridged and extended through scaffolding efforts; for instance, as external assistance is gradually reduced, the learner can achieve independent competency in the task (Gredler, 1997).

In this particular study, there were various degrees of effectiveness in performing moderating functions such as recognition and prompting. The mere performance of recognition and prompting without involving the real substance of the subject matter did not always generate positive effects (i.e., increased participation and interaction). As Xin (2002) and Shi (2005) observed, just being a cheerleader is not enough. It sometimes worked at the beginning of a seminar; however, the effect diminished quickly if there was no real intellectual substance combined with the cheering and soliciting. When a moderator was demonstrating and modeling, hopefully within the zones of proximal development of most or all of the participants and coupled with deep engagement with real issues related to the topic, participants were drawn into the discourse.

Example 6: Moderator Postings Involving Demonstrating and Modeling

#132

Amy (Sep 29 9:30pm):

i like the fact that it is an 'i statement'
it describes without evaluating or judging what i observed
ie. you are driving at 150miles/hour

and not
you are driving like a maniac

then, i get to say what i feel
that's not negotiable
if i say i feel scared, no one can tell me i don't, or shouldn't
then i like the part where i get to elaborate on my reasons, though this
part is not always necessary
finally, i like the part where i can tell you what i need

i sure did not like it at first
criticized it, refused to use it consistently
till my friend said
ah, i see... you really don't wish to be heard, right?

In message #123, Amy posted new questions in order to bring the discussion to a deeper level (note that these questions were not included in the original agenda, but Amy raised these questions according to the situation - some students felt frustrated when beginning to discuss the formula). After most group members responded to the questions, Amy posted her way of looking at the formula using personal experience and reasoning at message #132. She was demonstrating and modeling, perhaps within the zones of proximal development of some of the individuals.

Example 7: Moderator Postings Involving Demonstrating and Modeling

#187

Philippe (Sep 29 9:50pm) :

mom, i am frustrated that we seem to miscommunicate as to what you need me to do to help out with dad. i feel like there is more that i can do, but i feel that you do not communicate this to me clearly. i would like to do what i can, but i need you to help me to understand what this is.

#193

Amy (Sep 29 9:54pm) :

Philippe: notice the 'you statement' you are making
how may you change that, i.e.
mom, when we discuss the type of help you need from me, i feel frustrated because i am not clear as to what you think i could be doing and i need you to be clear about what you think and say?

Students were asked to put forward a formation based on the formula given in Example 7. Group member Philippe did so in message #187. Moderator Amy gave concrete suggestions to individuals through modeling at message #193. The following is a similar example.

Example 8 Moderator Postings Involving Online Modeling

#349

Philippe(Sep 22 8:44pm):

Cheryl : no way, i don't think you come across as a pessimist. There's soooooooooooooo much to take in, so much going on, and your picture reflects that

#363

Amy (Sep 22 8:48pm) :

Philippe: what seems to be missing in this environment are the eye balls we all imagine are out there judging us
of course, those eyeballs rarely bother, being too busy worrying about their eye balls
but face2face, we imagine people see exactly what we wish to hide

here, there is a sense of perceived anonymity and safety
no eyeballs
you're at home
have more time to think here also...

Message #363 posted by Moderator Amy was intended to answer message #349 - and a few other messages in which Philippe and other group members felt that people tended to use the Internet, but he failed to clearly articulate his reasoning. Amy clarified what the students wanted to say but that they were apparently unable to articulate. In this sense, students' ZPDs were bridged. Based on this scenario, it appears that to moderate well--one needs not only effective scaffolding skills, but also sufficient knowledge of the area and ability to offer reflective comments and critical thinking or analyses.

Confronting and Conflicting

Social cognitive conflict theory (Clement & Nastasi, 1988; Piaget, 1977) provides insights on how online discussion can serve as a valuable contribution to learning. The underlying assumption of this theory is that knowledge is motivated, organized, and communicated in the context of social interaction. Doise and Mugny (1984) argued that when individuals operate on each other's reasoning, they become aware of contradictions between their logic and that of their partner

In effect, the struggle to resolve these contradictions propels them to new and higher levels of understanding. Research by Bearison (1982) as well as Perret-Claremont, Perret, and Bell (1980) supports the assertion that the conflict embedded in a social situation may be more significant in facilitating cognitive development than the conflict of the individual focusing alone (Rourke & Anderson, 2002). In Rourke and Anderson's (2002) study, students claimed that the additional perspectives offered by others in the form of opinions, personal experiences, and analogies added to their understanding of the content, and made it more concrete. Contradictory perspectives disturbed their initial impressions of the content and prompted learners to process it more thoroughly. This latter process, however, can only be precipitated by challenging and critical interactions. As Brown & Palincsar (1989) noted, "change does not occur when pseudo-consensus, conciliation, or juxtaposed centrations are tolerated" (p409). There is little argument that learning may be defined as the progressive modification of ideas and behaviors through interpersonal interaction.

There were times in this study when students became frustrated and they complained. Is it better for the instructor moderator to confront these reactions or to ignore or avoid them? Moderator Amy's practices provided some insight into this question. In Example 9 below, she confronted students' complaints:

Example 9: Moderator Postings that are Confrontational

#170

Olga (Nov 3 7:59pm) :

Rose: are they doing it again? This class is slow I'm starting to get annoyed... I'm only on 3hrs of sleep for 2 nights now...

#176

Amy (Nov 3 8:00pm) :

hmmm
a trick?
well

it was more like providing you with an experience of possible discomfort
the main risk is that you would get pissed at us, but hey,
we were willing to live with that
so if there was a trick, excuse me, but it is on us?

#190

Amy (Nov 3 8:02pm) :

Ofelia:

i would love to explain
i dont know which part you are not understanding though.

As an experiment, moderators did not arrive on time to see how students would react. Later, when the truth was revealed, some students complained and said it was a trick and they did not like it. Moderator Amy reacted by confronting the complaints. The effect of this approach was that students reached an understanding (or were pacified) and the discussion returned to task-oriented issues. In other groups, complaints about being tricked were not addressed by the moderators, thereby resulting in stifled or digressive discussions.

Example 10: Moderator Postings that Lead to Stifled Discussion

#148

Philippe (Oct 20 9:33pm) :

i think this was kind of a dumb assignment. i mean, all the questions were
basically just different ways of re-wording the same question, and i'm
just not convinced that the results are very meaningful

#158

Amy (Oct 20 9:34pm):

Philippe: i'm not a fan of questionnaires myself
yet this one is actually a very good one, in as much as it has very high
internal validity and is used in many selection processes both in academy
and in corporations.

i would suggest we get past what we don't like though and look at what is
useful about this whole issue of learning and learning style.

Here is another example of a student complaint. One student complained about the assignment in message #148 and called it “dumb” and not meaningful. In posting #158, the moderator handled the complaint by voicing her opinion and suggesting more positive reactions: to find what was useful about the whole experience.

It is extremely interesting that some active individuals defended and debated fairly different and conflicting ideas. They noted their different viewpoints from their peers as well as from the moderator; in fact, there were also occasions where they agreed to disagree. As they assumed or appropriated roles that the moderator modeled, they began to share the role of a moderator. Here are some examples.

Example 11: Students Assumed the Roles that the Moderator Modeled: Confrontational and Fostering Debate

#501

Gabriel (Sep 22 9:51pm) :

Brandie, i would tend to think in the ways of “well he got what he
deserved” which might not be the RIGHT thing to do.

#507

Gabriel (Sep 22 9:52pm) :

Tracy: that doesn't sound too healthy. Don't you think that sometimes if you consciously behave the way you do, people will start to think that you're getting annoying?

#512

Samantha (Sep 22 9:53pm) :

Tracy: I voice my opinion a lot too, but you have to know when to keep it closed sometimes.....it CAN get you in trouble....

#526

Gabriel (Sep 22 9:56pm) :

But hold on, all this THEORY is nice and dandy but is this the way the world really works? I would think not. I would think the world works with 'survival of the fittest in mind'. Those who can empower others and order others around always seem to win?

#553

Brandie (Sep 22 10:02pm) :

Myrna: No i don't think it sounds selfish to respect yourself...hmmmm...but to put priorities in me before others does sound selfish..

#555

Gabriel (Sep 22 10:03pm) :

But is simply being AWARE only a way to excuse your cowardice and non-action?

Postings from Example #11 show when individuals operate on each other's reasoning, they become aware of contradictions between their logic and that of their partners. The struggle to resolve these contradictions might very well propel them to new and higher levels of understanding.

Setting up Norms

As the focus changes from "teaching" to active "learning," the instructor must take substantial responsibility for fostering a learner-centered peer collaborative learning environment. Group dynamics contribute to students' performance in collaborative learning and to their satisfaction with the learning experience (Anderson, 2006; Park & Bonk, 2007). Some participants' "free riding" and "social loafing" actions as well as their failure to contribute, however, can damage others' enthusiasm and motivation in the course of collaborative learning. In addition, the feeling of "talking in a vacuum" with online collaboration, frustrations with technology, and other factors make online collaboration a challenge to many participants (Samlon, 2000; Zhang, 2004). What did expert moderators do to activate the participation of all group members? Below is one example.

Example #12 Moderator Postings that Set up Norms

#467

Amy (Sep 22 9:37pm):

be fun to count all the languages between us
another thing that would be good, for the rest of the semester, if we all

agreed to some protocol
like for example
when it comes to taking turns, how about we use the room menu?
whomever is first there, goes first and so on
that way, the Johari window of the group would enlarge some
we will all know that this is how we do an activity

i need feedback
does this make sense?

Here, in the beginning of the second part of the conference, Moderator Amy was setting up norms for the discussion. She proposed that people take turns. Apparently, students did not understand her directions. She stopped some off-task discussion in message #474. She posted the main discussion topic in message #491 and then clarified the situation in message #492. After Amy set up the norms and gave clearer directions and guidance, the discussion did not appear to need as much prodding but, nevertheless, continued in an active and lively manner.

Social-emotional Elements

In the virtual environment, as in the face-to-face environment, students naturally showed affective reactions - interest, boredom, happiness, sadness, and anxiety (Fredricks et al., 2004). The social dimension is a crucial factor in determining the “climate” of conferences; that is, the willingness of people to contribute and engage seriously with the effectiveness of the discussion (Cook & Ralston, 2003; Park & Bonk, 2007). In addition to constantly checking the task progress, the instructor also needed to provide motivational moderations by recognizing individuals engaged in active collaboration as well as simultaneously encouraging others who were absent from the discourse or less active to be more active participants.

Example #13: Mixing Moderation with Social Emotional Elements: Motivational Moderating

#366
Amy (Sep 22 8:50pm):

Ofelia: smile
yes
i earn my living with such things

John: lol
good job!

Fiona
are you here?

Example #14: Mixing Moderation with Social Emotional Elements: Motivational Moderating

#495
Amy (Sep 22 9:41pm):

Rose: oh dear
you are tired
we just had 10 minutes or so
hugging you
so
lets go

It is difficult to find significant effects of teacher’s moderating levels on student social emotional engagement from the quantitative measures alone due to various limitations of these measures.

However, it is useful and informative to observe the efforts that moderators made to facilitate student social-emotional engagement. The above are only a few of many pertinent examples.

Discussion

Using the quantitative analysis results as a guide, the researchers identified transcripts and sections of transcripts for qualitative analysis. Putting the transcripts and sections of transcripts of interest in both their broader and immediate context, the descriptive discourse analyses resulted in a general picture of the interactive process of synchronous online discussion through the analysis of sections of transcripts. Five themes of effective moderating strategies, together with the supporting theories and practices, were discussed. As noted earlier, these themes are: (1) providing hooks with both ends; (2) modeling and tele-mentoring; (3) confronting and conflicting; (4) setting up norms; and (5) social-emotional elements. While this is not an exhaustive list of moderating functions, it does serve to highlight some observations of good (and not-so-good) moderating practices and how they affected the meaning construction process where scenarios of learning were seen to take place (or not). We argue that these themes, emerging as they do from the qualitative analyses, (and consistent with existing theories and practices), show the manner in which instructors manage the ebb and flow of synchronous discussion as well as how this affects student engagement.

The methodologies and findings of this study contribute to a better understanding of how teachers can provide effective online mentoring and scaffolding to facilitate student engagement with each other and with the subject matter. Findings from this research should inform research and practice related to the larger goal of improving the quality of online teaching and learning.

The analysis of synchronous computer conferencing transcripts provides a way to decrypt interactional patterns of group discussion in order to understand the learning process of individuals who participate in such discussions. It also elicits data useful for gauging the efficacy of interaction among instructors and students. The analysis of the transcripts of computer conferences can also shed light on how the collaborative learning process can be supported, sustained, or hindered (Henri & Rigault, 1996; Fahy, 2001; Rouke, Garrison, Anderson & Archer, 2001). Only when we have a better understanding of what is happening in computer conferencing can we offer specific suggestions about how to make use of this medium for learning (Henri, 1991; Young, 2004). This understanding comes only from a finer-grained analysis of the content of the conferencing as incorporated in the present study.

Study Limitations

There admittedly were many limitations related to this particular study. For instance, the study was made in a specific context: a synchronous, online, three-credit university level course structured and moderated by instructors. As such, the course had its own unique subject matter, tasks, and structure. Moreover, the study was a quasi-experimental research project wherein the assignment of group membership and moderators used some randomization. In theory, a true randomization would have involved randomly assigning individuals to controlled or pre-selected moderating conditions.

Another key limitation was that this study was based on one kind of technology - a synchronous conferencing tool that has its own unique features, options, and limitations. There are an enormous variety of conferencing tools available today that could have been selected instead; both asynchronous and synchronous. Even commonly used and debated synchronous tools such as Adobe Connect Pro (i.e., formerly Breeze), CCCConfer, Centra, Wimba (formerly HorizonLive), Interwise, LiveMeeting, NetMeeting, and WebEx may provide different learning environments with vastly different affordances and constraints. In addition, the emergence of the

Web 2.0 in recent years provides many other more ubiquitous and subtle channels for synchronous interaction and episodes with previously thought to be asynchronous technologies which occur so quickly one may ponder whether the setting is, in fact, synchronous.

A third limitation is that such a technology was novel to most of these students. Not only is synchronous instruction novel in higher education, but the eClassroom within the Learnbydoing eClassroom system has many highly unique features including the capabilities to post your picture with your post in different sizes. As with any new technology, there is great need for instructor moderation and support.

In addition, we did not determine previous familiarity with synchronous technology or the Learningbydoing system. The interactions and resulting learning here were undoubtedly affected by student familiarity with the system. A follow-up study with a group of students who had familiarity with the system or other synchronous tools might explore their interactions, perceptions, and levels of cognitive processing. But this is just one system. There are dozens of other synchronous systems available today; each of which may offer different features and capabilities, and hence, different opportunities for facilitating cognitive and metacognitive thought. The extensive learning and instructional possibilities, in fact, may be reasons many educational researchers seem stymied from attempting to make an impact in this exciting field.

A fifth limitation is that this was just one class in one university. What would happen in other disciplines or levels of education? For instance, might such a tool be used in corporate training situations with just-in-time and on demand synchronous sessions? In such a situation, a moderator might be available at set times or when needed to answer specific questions of employees or trainees. And in K-12 education, mentors might be available for students studying for exams or in difficult math or science topics. The forms of moderation, however, will likely vary quite significantly from the formats we discovered in this particular study. Stated another way, there are limited generalizations from our results. However, when some of the synchronous studies undertaken to date are looked at, interesting guidelines and caveats for instructors can be formulated (see Park & Bonk, 2007, in press, for instance).

Future Research Suggestions

There are many directions for research on synchronous instruction. For instance, future studies might attempt to control teacher moderating levels to examine the effects of moderating on student engagement. Future studies might also observe students as they progress through a second or third course with this tool, i.e., conducting a longitudinal study.

Furthermore, much can be done with the data that the system collects. For instance, students might be asked to look at their transcripts and describe their learning. What are the types of scaffolds that they found especially beneficial? Researchers might ask them to circle or label situations or areas wherein students felt that they were learning at a surface level as well as a deeper level. After those retrospective analyses, they might engage in more synchronous sessions. Their ensuing behaviors might be compared. Instructors might also be pulled aside to discuss their synchronous interaction experiences. Perhaps different forms of online mentoring might be displayed and discussed individually as well as collectively in focus groups.

As indicated, the primary data used for this study were automatically archived transcripts. Future studies might collect robust data - such as surveys, interviews, focus groups, and course products - to help build a deeper understanding of the issues and problems underlying synchronous online learning. At the same time, researchers in these areas might ask students to retrospectively reflect on their chat transcripts or watch and comment on a replay of their synchronous chat sessions. Instructors, too, might be directly or indirectly involved in such retrospective analyses. For

instance, both students and instructors might offer insights into the cognitive, behavioral, and social activities separately and then combined as instructor-student teams.

Given the current emphasis on blended learning environments, yet another limitation here was that our study was based on one level of technology application; i.e., a fully online situation without any face-to-face meetings. The types of synchronous facilitation and interaction might be drastically different in a blended situation wherein instructors have more personal information and experiences with their students, and vice versa. Differences in any delivery formats—face-to-face, fully online, blended, etc. might generate different needs for moderation and interaction (Anderson, 2006; Duemer, et al. 2002; Park & Bonk, 2007; Zhang & Ge, 2003). As the formats of instructional delivery continue to splinter, and, at the same time, blend together, the world of synchronous research will become more fascinating and vital to understand. To design effective courses, programs, and associated training experiences, instructors as well as instructional designers, and perhaps even administrators and training department heads, across educational sectors, need to know more about this unique area.

This study is only one look at online synchronous moderation. It provides a humble starting point for future empirical studies. To understand the dynamics of synchronous online conferencing, research must consider all aspects of online collaborative learning simultaneously: the individuals, the group, the team task, and the delivery media (Keefe, 2003; Liu, et al. 2005; Zhang & Ge, 2003). And the collaborative technologies for virtual teaming, tutoring, debating, and other course activities, of course, are not limited to synchronous systems. Today, there are myriad tools for learning and collaboration, including the uses of Wikis, blogging, social networking, and text-based commenting and annotation. Web 2.0 provides unique avenues for participatory learning. Now Web 2.0 researchers need to ask how experiences and expectations for such participatory systems and learning environments impact student's facility at using synchronous systems as well as their desire to benefit from them. This might be a match made in heaven!

Final Comments

This study linked both the processes and the educational objectives of computer conferencing to student engagement. As such, it fills a significant gap in the synchronous conferencing literature. Just one gap was addressed here; there are many more. Eventually, research in this area can extend to online training programs and curricula. It might also extend to K-12 curricula and informal learning areas. As bandwidth increases and the cost of online interaction plummets, there are likely thousands of learning situations which can benefit from such research. In the near term, the results of the present study can help researchers and practitioners develop better protocols for moderating online discussions. Such knowledge is essential if online learning (particularly synchronous conferencing) is to achieve its full potential. In the long term, synchronous instruction is increasingly part of the blended and fully online teaching arsenal. Additional comfort with it, better understanding of it, and creative implementation using it, should elevate the possibilities and potential for synchronous instruction in higher education as well as other environments. Insightful next steps in this area will be crucial for student learning and interesting to monitor.

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Editor's Note: The human learning process is extraordinarily complex. A multitude of factors influence this process positively or negatively. Dr. Ya-Wen Teng's research in motivation and engagement is a welcome addition. She analyses factors that are significant predictors of success in online learning.

Students' Backgrounds and Behaviors in a Web- Assisted Learning Environment

Loretta Ya-Wen Teng
Taiwan

Abstract

The study aimed to explore the predictors of the motivation to succeed, motivation for online participation, enjoyment in online learning and overall motivation to learn. The results indicated that gender and the enjoyment in online networking predicted the motivation for online participation and the motivation to succeed. The students from night school showed a better enjoyment in online networking while females and those who had noticed a difference of the course delivery format showed a higher overall motivation to learn. The results provided implications for planning and facilitating web-assisted learning to accommodate different students, especially at Taiwanese technical institutions.

Keywords: Web-assisted learning, blended learning, learners' backgrounds, online motivation, online enjoyment, online networking, web-assisted learning behaviors, blended learning behaviors, computer-assisted learning.

Introduction

The scope of research in online learning ranges from studying the instructors' roles, students' perceptions, satisfaction, performances to its effectiveness. In the literature, it is not uncommon to find discussions of how participants' characteristics influence online learning. However, little attention has been drawn to how learners' backgrounds may be inter-related to influence their behaviors in a web-assisted learning environment.

In recommending the directions of research for online learning, Kennedy (2000) cautioned how student input variables might have confounded the results from existing studies. She suggested that the initial differences in online students needed to be considered to avoid misinterpreting any research findings when making inferences.

It is thus important to investigate the learners' backgrounds for a more comprehensive web-based instructional design, as well as understanding the complexity of how these factors may be inter-reliant to influence various learning behaviors in a web-assisted learning environment.

Literature Review

The term "online learning" has been broadly adopted to describe courses or learning activities which are delivered fully online or featured by the integration of information technologies. Alternatively, it has also been described as "computer-assisted instruction," "web-based learning," or "internet-based learning." The following review encompasses learning activities that were conducted purely online or in a hybrid mode mixed with online and face-to-face instructions.

Gender and Age with Online Learning

In the literature of online learning, gender and age are among the most widely discussed in identifying perceived or measured learning. The results have been mixed in various studies.

Shaw and Peter (2000) concluded that there were no significant differences in how older and younger students reacted to asynchronous networked learning. Similarly, Lu, Yu, and Liu (2003) found that there were no age and gender differences in how the students performed in a web-based course. However, a difference in how non-traditional and traditional college students learned in an online environment was reported by Miller and Lu (2003) from surveying a group of online instructors.

While Wojciechowski and Palmer (2005) found that older students performed better in online classes, in studying the level of engagement of online students, Garland and Martin (2003) discovered that male students accessed the course website more often while their female counterparts participated in more online group activities. In another study to investigate how age, gender, ability and motivation related to the achievement in an online course, older students were found to be more motivated in web-based learning, but gender did not significantly predict performance (Hoskins & van Hooff, 2005). Despite the lack of a significant difference, males in this study demonstrated more knowledge in using web discussions but were less comfortable in web dialoguing.

Family Backgrounds and Online Learning

Tinto (1993) stated that student attributes and family background affected the initial level of commitment to goal attainment. Riehl (1994) concurred that those with one or more college-educated parents were more likely to stay in college. From investigating the factors affecting the development of life-long learning in Malaysia, Alwi, Syed, Mohamad, and Said (2005) concluded that when parents valued education more, their children put more efforts in learning.

Research showed that first-generation college students experienced college life differently from their traditional-aged peers (Terenzini, Springer, Yaeger, Pascarella & Nora, 1996). Aside from being predisposed to a lower academic achievement (Riehl, 1994), first generation students were likely to receive less support from families for education (York-Anderson & Bowman, 1991). On the contrary, Pratt and Skaggs (1989) did not support the notion that first-generation college students were at greater risk. A finding from their study led to a conclusion that this student population had a stronger institutional commitment and did not differ in goal attainment as well as in academic and social integration.

With online learning, Williams and Hellman (2004) found that first-generation college students reported a lower level of self-regulation for online learning than their second-generation counterparts. A study on distance learning in Malaysia also showed that family background and attributes affected distance learning (Dzakira, & Idrus, 2003). As for computer skills, Martinez and Mead (1988) found that there was a positive correlation between parents' educational background and students' competency in using computers to learn. In measuring the acquisition of information, Buzzetto-More and Sweat-Guy (2006) discovered a marginal correlation between parents' level of education and freshmen's technological readiness in a Historically Black University. Finally, Barker and Wendel (2001) found that strong parental support contributed positively to the success in online learning.

The Social Aspect of Online Learning

The development of online communities was found to contribute positively to the quality and quantity of learning (Picciano, 2002). This notion was supported by numerous studies. For instance, Levin, Waddoups, Levin, and Buell (2001) reported that an environment of high student-to-student interactions contributed effectively to online learning. The positive aspect of creating a sense of community was also proposed by Wiesenberg and Hutton (1996), who attested that online networking increased the students' ability to think independently. Lam, Cheng, and McNaught (2005) empirically proved that active online participation induced positive learning

outcomes. They also highly valued online communication as beneficial to the learning process. In Brook and Oliver's (2003) review of students' characteristics that led to the development of an online community, they summarized that socialization tended to be gender-based. This position was confirmed by one of Richardson and Swan's (2003) research finding that gender accounted for online students' perception of social presence. These researchers found a high correlation between the students' perception of social presence and perceived learning. In other words, more learning occurred when a sense of bonding were perceived among the learners. As Gunawardena and Zittle (1997) indicated, social presence in online settings was related to learner satisfaction. On the contrary, lacking such an experience can create a barrier in online learning (Muilenburg & Berge, 2005).

Motivation and Enjoyment in Online Learning

As Muilenburg and Berge (2005) pointed out, the absence of motivation from learners prevented success in online learning. A group of online graduate students shared their insight that motivation impacted the online learning experiences (Song, Singleton, Hill & Koh, 2003). A similar observation was reported in Bullen's (2007) study which noted a positive influence of intrinsic motivation on active participation in online tasks. Kennedy (2000) considered motivation the key to successful online learning and encouraged future researchers to study how it could relate to online learning experience and outcomes. Interestingly, Prince and Stern (2002) found that older students who participated voluntarily were more likely to put in more efforts in online learning. In another instance, Hoskins and van Hooff (2005) witnessed older students' inclination to post online and male students' preference in online communication.

The enjoyment for online participation appeared to be another vital factor for effective online learning. A study on the acceptance of internet-based learning medium highlighted perceived enjoyment as a predictor of the intrinsic motivation for internet-based learning (Lee, Cheung, & Chen, 2005). This proposition was not a novelty because Salmon (1998) had previously advocated for online moderators to foster enjoyment. According to Pintrich and De Groot (1990), those who perceived learning as interesting tended to be more cognitively involved in the process. More evidences were presented by Wu and Hiltz (2004), who concluded that the perception of learning was strongly related to online learners' level of enjoyment. Similarly, Muilenburg and Berge (2005) found a connection between enjoyment in online learning and social interactions.

Obviously, learners' backgrounds can influence their experience with online or web-assisted learning. While the backgrounds can each impact learner's experience and perception with online learning, the question of how and which of these variables can combine to influence online learners' experience remains unanswered.

Purpose of the Study

In this study, the author sought to examine how gender, age, type of high school attended, and parents' educational background of college students influenced how they behaved in web-assisted learning environments. Specifically, the study was designed to answer the following questions:

In a web-assisted learning environment,

1. what predicted the motivation to succeed in this course, motivation for online participation, and the enjoyment in online learning from a combination of variables?
2. what predicted the students' overall motivation to learn from a combination of variables?
3. The operational definitions of motivation and enjoyment in online learning are described in the "method" section.

Method

Participants

One hundred and eighty eight Taiwanese technical college students who enrolled in “Physiology and Mental Health,” a general education requirement taught by the researcher were surveyed in the study. The agreement to be surveyed was obtained and the survey was administered at the last class session. Among them, more than half (61.7) participated in the online component of the course. There were more female students (77.7%) and most of them were freshmen (65.2%). More of them were from the day classes (58.5%) and most of them went to vocational high schools (79.3%). Those whose parents were in the labor (38.3%) and business (31.9%) industries represented most of the sample. In addition, 89.4% of them were first-generation college students whose parents did not attend college. There were 81.3% of them who agreed that they had to contribute to family income. A number of them reported working for more than 25 hours per week (62.9%). Those who worked over 35 hours a week counted for 41.1% of the sample.

Instrumentation

The measurement for the study was a survey of 30 questions made up of a demographic component yielding background information and Likert-scaled questions for assessing various learning behaviors.

All questions were conceptualized first for their relevance to the measured variables before being delivered to a panel of five experts for a test of validity. These experts were college instructors of social sciences and were familiar with web-based learning. Through this process, five seemingly repetitive questions were dropped and changes in wording were made in accordance with the recommendations of the experts.

The correlations among all of the variables represented by the survey questions were performed and those with high correlations ($r > .50$) were grouped together to avoid collinearity in subsequent analyses. Doing so resulted in the formation of the three variables listed below:

1. The motivation to succeed in class
2. The motivation for online participation
3. The enjoyment in online networking

The motivation to succeed was composed of “the desire to receive a good grade for the course” and “the desire to earn extra credits by participating in online discussions.” The motivation for online participation was a composite scale of “time spent in completing online assignments,” “logging in weekly to complete online assignments,” “feeling that participating in online discussions improved the understanding of course content and key points,” “enjoying online discussions,” and “acquiring different viewpoints from group discussions.” The summated scale of “enjoyment in online networking” was computed from “feeling that participating in online discussions improved the understanding of course content” “feeling that online course content and activities were helpful” “online discussions helped me connect with classmates,” and “online discussions helped me connect with the instructor.”

Finally, the variables measuring the students’ overall motivation to learn were formed from combining “motivation to succeed in class,” and “motivation for online participation.”

The internal consistency of each of the composite variables was obtained with a Cronbach’s α of .69 for motivation to succeed in class, $\alpha = .84$ for motivation to participate in online activities, $\alpha = .87$ for enjoyment in online networking, and finally $\alpha = .87$ for the overall motivation to learn. Although the internal consistency of the variable “motivation to succeed in class” fell below the general acceptable level of .70, it was kept as a valid summated scale for its high conceptual agreement among the items, and proximity to the acceptable level suggested by content experts.

Procedure

In the beginning of the semester, the students were informed of the “blended” or “mixed” instructional/learning format of the course. Lecture presentations, both in Microsoft PowerPoint and video formats were made available through the university’s online course management system, Wisdom Master (<http://demo.learn.com.tw/1000410147/product2.htm>), developed by a local technology corporation in Taiwan. The access to the course was password protected and the verifications for course registrations were required by the system, and performed by the instructor. An orientation of the online participation was provided during the first four weeks of the semester and reinforced as needed thereafter. After the completion of the online course registration process, the students could access the course web site <http://elearning.ctust.edu.tw/> to participate in class activities.

The students were encouraged to participate in online forums with topics related to the course content. Each discussion was initiated by the instructor and announced in the announcement area of the course system prior to its being made available. Each of the six discussions lasted for about two weeks. The students were guided for their online participation in terms of the quality and quantity of the posts. To increase the interactions among the students, they were asked to respond to others in addition to posting their own thoughts. In order to foster the development of a learning community, an introductory forum with warm-up exercises and a social forum were offered for the students to get acquainted with their cross sectional peers.

Online office hours were offered regularly throughout the semester using the instant chat function of the courseware. External links to a free photo sharing web site and personality tests were provided for course related activities. The photo site was created to help personalize the learning experience. With the online personality tests, the students were asked to post their reflections in the discussion area before depositing the test results online in the course system’s assignment folder.

The evaluation of the students’ online activities was recorded and reviewed in class during mid-term and again, close to the end of the semester. The online participation was counted as a part of the students’ assignment grade, which contributed 30% to their course performance.

Results

Multiple regressions were performed to identify the predictors for the students’ motivation to succeed in the course, the motivation to participate in online activities, the enjoyment in online networking and their overall motivation to learn.

Motivation to Succeed in the Course

The analysis showed that 30% of the variance in the motivation to succeed was predicted from the eight variables combined. These variables were the enjoyment in online networking, parents’ educational background, family background, the type of high school attended, gender, hours of work each week, age, and whether or not they were from the day or evening school. The effect size was large. The variable of “parents’ educational background” referred to whether or not one or both parents had received college education. The question on family background asked the students to identify if they were from single-parent households. As a result, gender, $\beta = .166$, $p = .018$, and enjoyment in online networking, $\beta = .498$, $p < .001$, were found to significantly predict the motivation to succeed in the course ($R = .58$; adjusted $R^2 = .30$). This result is presented in Table 1.

Table 1. Multiple Regression Analysis on the Measure of Motivation to Succeed

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.029	.362		2.844	.005
	gender	.249	.104	.166	2.387	.018
	wrhrs	.039	.027	.106	1.439	.152
	dnt	-.034	.116	-.027	-.295	.768
	pted	.070	.128	.035	.547	.585
	grad	.016	.088	.012	.186	.853
	age	-.048	.048	-.083	-1.013	.313
	famback	-.032	.109	-.019	-.298	.766
	enjoyment in online networking	.511	.071	.498	7.184	.000

a. Dependent Variable: motivation to succeed

Motivation for Online Participation

Gender (Beta = .150, $p = .007$) and the enjoyment in online networking (Beta = .673, $p < .001$) combined to significantly predict the motivation for online participation ($R = .769$; adjusted $R^2 = .573$) when these two variables were entered into a regression model simultaneously, along with the following six other variables: hours of work for each week, taking day or evening classes, parents' educational background, the type of high school attended, age, and family background. About 57% of the variance in the motivation for online participation was predicted from a combination of these variables, which was a very large effect size. This result is summarized in Table 2.

Table 2. Multiple Regression Analysis on the Measure of Motivation for Online Participation ^a

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.849	.237		3.576	.000
	wrhrs	.024	.018	.079	1.374	.171
	dnt	.043	.076	.041	.568	.571
	pted	-.051	.084	-.030	-.607	.545
	gender	.189	.069	.150	2.752	.007
	grad	.016	.058	.013	.272	.786
	age	-.018	.031	-.036	-.563	.574
	famback	-.082	.071	-.056	-1.153	.251
	enjoyment in online networking	.581	.047	.673	12.443	.000

a. Dependent Variable: motivation for online participation

The Enjoyment in Online Networking

To identify the predictors for the enjoyment in online networking, seven variables were entered in the regression equation. These variables included gender, hours of work for each week, attending the day or evening school, parents' educational background, the type of high school attended, family background, and perceiving a difference in the course delivery method. The result indicated that attending the day or evening schools, $\beta = .283$, $p = .001$, significantly predicted the enjoyment in online networking ($R = .442$, adjusted $R^2 = .163$). Variance predicted from these variables combined was 16%, which was a medium-large effect size. Table 3 shows this result.

Table 3. Multiple Regression Analysis on the Enjoyment in Online Networking^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.647	.414		3.974	.000
	gender	.172	.111	.118	1.557	.121
	wrhrs	.036	.029	.102	1.271	.205
	dnt	.349	.106	.283	3.302	.001
	pted	-.090	.135	-.046	-.664	.508
	grad	.152	.093	.112	1.635	.104
	famback	-.083	.117	-.049	-.709	.479
	diffdisc	.087	.070	.088	1.246	.214

a. Dependent Variable: enjoyment in online networking

The Overall Motivation to Learn

The following 10 variables were considered in a regression model to determine the predictors for the overall motivation to learn: gender, hours of work for each week, attending the day or evening school, parents' educational background, the type of high school attended, age, family background, parents' occupation, whether they chose to attend this institution voluntarily, and perceiving the difference in the course delivery method. The analysis showed that 23% of the variance was predicted from these variables combined, which was a medium-large effect size. Furthermore, the combination of gender ($\beta = .202$, $p = .006$) and perceiving the difference in the course delivery method ($\beta = .203$, $p = .003$) significantly predicted the motivation to learn ($R = .524$, adjusted $R^2 = .232$). Table 4 shows this result.

Discussion

Gender emerged as an important predictor for the students' overall motivation to learn, participate and succeed in online activities. In general, female participants showed higher motivation in all three investigated areas. It was possible that female students were more attracted to learn in a non-traditional web-assisted course, when online dialoguing was an activity of their preference. In fact, research findings have revealed that females were better in building the affective and social aspects of an online learning community (Im & Lee, 2003). These findings indicated that female students who enjoyed networking in the online environment were more driven to participate and do well in online learning activities. The results also suggested that the female participants' enjoyment in online involvement led to their more satisfying experience in developing relationships with their peers and instructor.

Table 4. Multiple Regression Analysis on the Measure of the Motivation to Learn^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.800	.388		4.642	.000
	gender	.252	.091	.202	2.776	.006
	wrhrs	.036	.024	.119	1.508	.134
	dnt	.200	.102	.189	1.965	.051
	pted	-.076	.113	-.046	-.677	.499
	grad	.107	.077	.092	1.387	.167
	age	.055	.042	.113	1.306	.193
	famback	-.076	.097	-.052	-.784	.434
	pajob	-.023	.026	-.061	-.893	.373
	ctust	-.095	.058	-.111	-1.640	.103
	diffdisc	.172	.058	.203	2.990	.003

a. Dependent Variable: motivation to learn

Interestingly, females who had observed the unique course delivery method had a higher overall motivation to learn. Apparently, these students paid more attention to the course requirement. Besides participating in online forums, the students were required to collaborate in class for structured group discussions by rotating to assume different roles. Qu, Wang and Johnson (2005) associated motivation with the learners' focus of attention. Zhang, Cheng, He and Huang (2003) also predicted motivation from attentive behaviors. In a motivational model presented by Keller (1987), getting learners' attention was the key to improve their motivational level. Similarly, Tremblay and Gardner (1995) related attention, along with other factors, to motivation. It was possible that the female students' enjoyment in online participation contributed positively to their being more mindful with the collaborative feature of this course. This in turn could have influenced their motivation for optimal performance because according to Reeve (1989), enjoyment contributed to the persistence in an activity.

The fact that many evening students at Taiwanese technical institutions work and go to school full-time makes it difficult for them to interact with their classmates and instructors. In the Taiwanese higher educational system, only full-time attendance is allowed. Thus, the online forums might have become an alternative platform for socializing and networking under this circumstance. This may also explain why the evening students enjoyed online networking more compared to the students from the day classes. One explanation was that these students had developed mutual support among themselves for their online participation. Research has highlighted evening college students' need for learning support (Yan, 2006). Unfortunately, research also showed that many of the evening students expressed a lower level of satisfaction with the advising they had received from faculty (Dunker & Belcastro, 2003). It is important to note that in this study, the participants from the evening classes were all freshmen; therefore, the online networking experience might have extended an opportunity outside of the limited class time for those who were new to college to connect with peers, instructors and the new college life.

Apparently, the participants' family background, referred to as growing up with both parents or in single-parent households, did not influence their enjoyment in online participation and motivation

of various contexts. Students from single-parent households were not pre-disposed to a less motivated or enjoyable web-assisted learning experience. Interestingly, parents' educational background did not influence students' learning behaviors when considered among other factors. The motivation and enjoyment in online networking of first-generation college students were not undermined by their parents' having not received college education.

The study contributes to the research of blended learning which features the mixture of traditional and online instruction. According to the results, planning for online activities that are enjoyable is the key to achieve motivated learning. Additionally, web-assisted instruction can be a viable option for the development of social or learning networks outside of the regular class meetings. Future research can be designed to identify male students' leaning styles as associated with web-assisted learning, for promoting their level of motivation and enjoyment. Specifically, exploring the strategies for involving male learners in online communication can be helpful in planning web-enhanced instruction.

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Editor's Note: This research compares face-to-face and online learning for students with different learning styles. It finds that learning style is not significant in determining which mode of instruction is chosen nor is it a significant factor in learning effectiveness and performance.

The Relationship between Student Learning Style, Selection of Course Delivery Format, and Academic Performance

Chris Brittan-Powell, Harry Legum, and Elias Taylor

Abstract

The goal of this research was to investigate the role of student learning styles on student selection of, and performance within, academic coursework which was delivered in either a fully online or in a traditionally face to face format. Kolb's (2005) theory of individual learning styles was used to designate participants' preferred cognitive strategy for incorporating new knowledge and experiences. Results show that no unique relationship exists between student learning style and their selection of a traditional face to face course compared to a fully online course. Furthermore, student performance both within and across each course delivery type was not influenced by learning style. Implications of these findings are discussed.

Keywords: online, Kolb, learning styles, distance learning, education, instructional technology, personality, academic performance, learning technologies.

Introduction

The educational environment has been altered dramatically by introduction and advances of instructional technologies (IT). These technologies have changed the nature of the educational experience for both students and educators. While the implementation of IT has been significant, evaluation of its effectiveness has not. We are just beginning to understand the various pedagogical factors involved in the effective usage of technologies by educators and students.

The incorporation of IT into the delivery of academic coursework may take many forms. Among other possibilities, course delivery includes two distinct modalities: the fully online modality and the traditional face to face (f2f) modality. While there are variations in the structure in both traditional f2f and fully online modalities, each of these two modalities tends to have unique characteristics. Foremost among the differences is that fully online courses currently tend to be highly dependent upon the use of an internet based course management system (CMS) through which classroom interaction and communication occur. In contrast, interactions and communication between students and instructors in f2f classes generally occurs in person within a traditional classroom setting. Therefore, the context within which student learning occurs for either of these course delivery modalities is quite distinct. Thus, it is important to determine if there are psychological and pedagogical factors that differentially impact student learning in each of these respective course delivery modalities.

Educational specialists have identified students' learning style as key to their acquisition of new knowledge and skills. Kolb's (1976) theory of experiential learning styles has been one of the central theories used by educators to understand the influence of the nature of the educational environment (course modality) on student learning (Wierstra & DeJong, 2002). His typological theory was chosen for this study because it focuses on the interaction between the learner and the learning environment (Kolb & Kolb, 2005). Kolb's theoretical perspective reasonably paralleled our curiosity as to whether students' learning style influenced their choice of, and performance in, course delivery modalities (f2f and fully online).

David Kolb states that learning occurs by individuals going through a four phase cycle of learning. These phases are: Concrete Experiencing, Reflective Observation, Abstract Conceptualization, and Active Experimentation. While all students are assumed to utilize all four of these phases, his theory presumes that students will typically have a stronger preference a particular combination of them. This preference will then reflect the manner in which they approach acquiring new knowledge and skills (Kolb, 1984).

Students' preference for the Concrete Experience phase reflects their desire to learn by experiencing. Those with preferences for the Reflective Observation phase enjoy learning by reflecting on the learning material. Students showing a preference for the Abstract Conceptualization phase best learn by logically thinking about a learning situation. Those with preferences for the Active Experimentation phase find that learning by doing works best for them (Kolb, 1976).

The Concrete Experiencing and Abstract Conceptualization phases are deemed to be at opposite ends of the same learning continuum. Additionally, the Active Experimentation and Reflective Observation phases are viewed as being at polar opposites of another distinct learning continuum. Students' personal learning preferences among these four phases vary. While Kolb posits that effective learning requires students' use of some degree of all four learning phases, he states that most learners predominantly utilize particular combinations of two of them. These two predominant phases are then combined to identify the respective student's learning style. Utilizing Kolb's mapping of students' preferences results in four possible student learning style types: Diverging, Assimilating, Converging, and Accommodating (Kaye, 2005). A fuller description of each of these learning types is presented below:

- The Diverging Type is based on the students' preference for uses of the paired learning phases of Concrete Experience and Reflective Observation. As noted by Kolb, students prefer a more esoteric kind of course where they are allowed to use/combine imaginative observation and brainstorming with others. Students characterized by this learning type like a more personalized educational environment with open minded instructors and classmates. They also enjoy working in a group on course projects and information gathering.
- The Assimilating Type reflects students' preferences for the learning phases of Reflective Observation and Abstract Conceptualization. Kolb states that students with this learning type enjoy abstract ideas and concepts and tend to seek out more of the logical soundness, rather than concrete value, of an idea. Additionally, they generally prefer a course structure utilizing lectures, readings, and the exploration of analytical models in order to allow them to fully think through the material.
- The Converging Type combines the learning phases of Abstract Conceptualization and Active Experimentation. An apt description of this type of student is that they are very practical and are problem solvers. They tend to prefer to focus on particular tasks that need to be resolved and are not highly interested in using social networks toward this end. Individuals interested in technologically oriented careers commonly fit into this type.
- The Accommodating Type pairs the learning phases of Active Experimentation and Concrete Experience. Students with this learning type like action oriented learning settings that require hands on experience. They tend to prefer the use feelings rather than a logically oriented approach to solve problems. Kolb notes that this style of learner would prefer to do field work rather than focus on abstract lecture material (Kolb & Kolb, 2005).

The distinctiveness of the above learning types highlights the variability in students' experiences of formal learning situations. Educators seek to understand what instructional strategies might best serve students. In this vein, we desire to know not only if IT is effective, but if it is differentially effective with different types of student learners. Such knowledge could potentially help us determine how our pedagogy could strategically tailor our IT in order to increase the likelihood of students' academic success. Furthermore, given that students tend to intuitively know their own learning preferences, we evaluated if they tended to choose one course delivery modality over another contingent upon Kolb's theorized model. Given this reasoning, the specific research questions guiding this study were:

- a) Does students' Kolb learning style influence their choice of course delivery format?
- b) Does Kolb learning style differentially influence students' academic performance contingent upon the respective course delivery format?

Method

Participants

This study was undertaken at a Historically Black College/University (HBCU) where the majority of students (approximately 81%) are women. A total of 108 students participated in this study. All of these students were enrolled in the same advanced undergraduate class (Psychological Assessment) and in all cases had the same instructor. Students were enrolled in one of two distinct sections/formats of the course. Each of these two sections had unique course delivery formats – fully online or traditional face to face (f2f). At the time of registration, all students were able to self-select which one of these two course delivery formats they desired. Data for each of these respective formats were collected during two consecutive semesters. Seventy-two participants were enrolled in a fully online section of the course which used a CMS (Blackboard) and a lecture capture system (Tegrity). The lecture capture system (LCS) provided students with video-recorded lectures via the internet. This could be watched by students either by video-streaming to their computer or via podcasts. All the lectures covered the identical set of PowerPoint lecture material. At the beginning of each semester, online students received comprehensive training on use of all IT, and IT assistance was easily available either through the instructor or established University IT services for the duration of the course. Students who took the course in this manner were labeled the Online Students. The age of the Online Student group ranged from 19 to 61 years ($M = 25.55$ years, $SD = 3.87$ years). The majority of participants were women (91%). Furthermore, most participants identified themselves as Black (93%), with the remaining (7%) identifying as White.

In addition, 36 students received instruction and evaluation using a traditional f2f classroom meeting format. While Blackboard was used to post relevant course information to students in the f2f group, student usage of it was not required. This group was labeled the f2f Students. The age of the f2f Student group ranged from 20 to 54 years ($M = 26.14$ years, $SD = 2.77$ years). The majority of participants were women (82%). Furthermore, most participants identified themselves as Black (95%), with the remaining (5%) identifying as White. An earlier study comparing only student grades across both delivery formats (Fully Online and f2f) of this course found no statistically significant difference due to course delivery format (Brittan-Powell, 2008).

Measures

Academic Performance. Student end of the semester numerical grade served as the measure of academic performance. This value could range between 0 and 100. All students, across both conditions, received identical midterm and final exams with both of these exams given in a face to face setting. In addition, students in both course delivery formats received an identical set of 10

quizzes during the semester all of which were taken through the CMS under identical conditions. Test security was maintained throughout the study.

Kolb Learning Style Inventory, Version 3.1 (KLSI 3.1) (Kolb & Kolb, 2005)

The KLSI 3.1 was used to measure individuals' learning styles in both educational settings and everyday life settings. Based on participants' rank ordered responses to twelve items, they are categorized as having one predominant learning style out of the four that are possible in the Kolb model. The four possible learning styles are respectively: Accommodating (AC), Assimilating (AS), Converging (CO), and Diverging (DI) and are fully described above. Across four distinct studies, internal consistency reliabilities for the respective KLSI 3.1 subscales have been shown to vary between .70 to .84 (Kayes, 2005; Rubie & Stout, 1991; Veres, Sims, & Locklear, 1991; Wierstra & DeJong, 2002). Furthermore, Veres et al. (1991) found test-retest reliabilities for all four subscales of the KLSI 3.1 to be above .9.

Design and Procedures

This study utilized a Causal-Comparative / Ex-Post Facto research design. At the time of registration, all students were able to self-select the course delivery format they desired (f2f or fully online). Both course delivery formats used identical sets of PowerPoint lecture notes to deliver the course content and all additional materials were available to all students. All students, in both conditions, took an in-person final exam, at the end of which they were provided an optional extra credit opportunity in which a brief survey containing a brief demographics page and the KLSI 3.1 was administered.

Results

The first research question sought to evaluate whether students' preference for course delivery modality (Fully Online vs. f2f) was contingent upon their Kolb learning style. Given the nature of the research question looking across two nominal treatment conditions within which students could be determined as one of four nominal learning styles, a 2 by 4 Chi-Square test was used. Results of this inferential test were non-significant, $\chi^2(3, N = 108) = 3.22, p = .21$, suggesting that students' learning style did not influence their selection of taking a course in either a f2f or fully online format.

The second research question investigated whether students' Kolb learning style influenced their academic performance (course grade) differentially contingent upon whether they took the course in either an f2f versus a fully online delivery format. A 2 x 4 ANOVA revealed no significant differences for either the main effect of Course Delivery Type, $F(1, 100) = 1.32, p = .85$, or the main effect of Kolb learning style, $F(3, 100) = 1.44, p = .47$, or the interaction term $F(3, 100) = 1.76, p = .69$. These results suggest that there is no relationship between students academic performance and their Kolb learning style.

Discussion

Given the growing use of IT in academia, it is important that we determine the relevant human factors that may influence student course performance. This study attempted to utilize the Kolb theory of experiential learning (Kolb, 1984) to determine if the typology utilized in it might be of assistance in determining the effectiveness of two distinct course delivery formats (f2f and fully online) on student learning. Kolb's posits that people are predisposed toward predominant learning styles through which they incorporate new knowledge and skills. As described above, Kolb has shown that in traditional learning contexts, students exhibit preferences for how they best process experiential material and thus learn most effectively. However, the findings of this

study showed that students did not have a preference for either course delivery format based upon their learning style. Furthermore, it shows that their academic performance in either course delivery format was not contingent upon their learning style. Given these findings, no substantial inferences may be made with respect to how Kolb's learning theory might be utilized in providing a traditional predominantly lecture style course to students. Rather, these findings suggest that, for at least this type of course, given proper IT support, students find either course delivery format similarly effective regardless of their learning style.

While these findings are of a nature that no suggestions should be made to how courses are designed or delivered, it can be suggested that the relatively new nature of IT in education requires us to inquire anew into the human factors that may be salient to creating effective educational opportunities. Kolb's theory was developed over two decades ago, well before the introduction of IT such as course management systems and lecture capture systems into college level coursework. Teachers had comparatively less need to consider the potentially reciprocal influence of IT on their teaching pedagogy. Furthermore, it has been suggested by some that a 'neo-millennial' perspective (Dede, 2006) should be taken toward understanding students' learning styles. The non-significant nature of the results found in this current study are perhaps best understood as informing the research in this area in two distinct manners. First, this study suggests that online education is as efficacious as traditional f2f education when viewed from the perspective of student learning styles. Secondly, these results show that we need to reevaluate how we comprehend student learning styles given the reality that IT has altered the nature of our experiential educational environments. Both of these possibilities support the need for further research into the area of IT and student learning styles.

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Editor's Note: Dr. Kwapong's hypothesis that the design of distance learning is gender relevant opens a veritable Pandora's box. There is a significant body of research on differences in male and female learning that needs careful review as to gender relevance in design, configuration and dissemination modalities.

Access to education, or lack thereof, is key to learning for both men and women. Improvement in design of instruction that is relevant to distance or face-to-face learning is always to be encouraged and welcomed. Whether gender-based redesign of distance learning is valid and necessary is a challenging and complex issue for research.

A Case for using Open and Distance Learning (ODL) to Widen Access to Tertiary Education for Women

Olivia Adwoa Tiwaah Frimpong Kwapong

Ghana

Abstract

Education has become prominent among the various strategies for promoting women's empowerment. Education is so critical that access should be created for women by *all means*. By its nature of overcoming time and space and meeting the learning styles of women who play triple roles in society, open and distance learning is a sure way of making education accessible to women no matter their location, status and situation. Theories of distance education also confirm that open and distance learning is no doubt promising for creating access to education for women and meeting their learning style. Statistics of distance learning institutions indicate a higher percentage of female enrollments compared to men. This is a unique mark of open and distance learning that will be very challenging to attain in on-campus programmes. It is in view of this peculiarity of open and distance learning programmes that this paper advocates extensive use of distance learning for promotion of education of women at the tertiary level.

Keywords: Distance learning, open learning, open and distance learning, distance education, theories, women, education, higher education, tertiary education, ICT, Ghana.

Introduction

Gender disaggregated data on education has revealed that compared to their male counterparts, women have, for the most part, attained only low levels of formal education. This is based on cultural factors and women's role in society – child bearing, child upbringing, community commitments and societal perceptions. As one intervention to widen access to higher education, the Government of Ghana has drawn strategies to promote open and distance learning. Though special emphasis has not been placed in the Government's policy to directly use open and distance learning (ODL) to facilitate women's education at the higher level, the thinking of this paper is that the uniqueness of ODL could be explored for this purpose.

Gaps in Tertiary Education in Ghana and Justification for ODL for Women

Ghana has been in a long search for appropriate measures of expanding its educational programmes to meet its population growth and the increasing demand for tertiary education. The country is also in search for an educational system that will bridge the gender gap. Despite the establishment of five public universities since 1948 and private universities since 1998 in addition to the existence of Polytechnics in all the ten regions of the country, the country still suffers an overall limited access to tertiary education and lower female enrolment.

The nation's educational policy is to obtain 50% males to 50% females in tertiary education. Among the efforts to bridge the gender gap is the affirmative action to reduce the selection aggregate by one for women. Statistics show that during the 2005/2006 academic year, 55% of

qualified applicants were admitted into all the public universities and 78% into the polytechnics. During the same period, 2005/2006 academic year the male to female enrolment ratio was 65:35 for the universities and 70:30 for the polytechnics (NCTE, 2006). This does not satisfy the national norm of 50:50 ratio. Meanwhile the margin is not all that wide from the basic to secondary school levels. There are closer margins of 47.9% female enrolment at the basic level and 55% at the secondary level compared to 35% in the universities and 27% in the polytechnics during the 2005/2006 academic year. The gap widens as women climb the academic ladder. The following tables provide a detailed and clear picture of the situation over the years.

Table 1
Female Enrolment at Basic and Secondary Levels (%)

Type Years/Levels	Public		Private	
	Basic	Secondary	Basic	Secondary
2002/2003	47.3	-	48.8	-
2003/2004	47.3	-	48.9	-
2004/2005	47.4	-	48.7	-
2005/2006	47.9	42.3	49.3	55
2006/2007	47.8	42.7	49.3	54.6

Table 2
Female/Male Enrolment at the Tertiary Level

Years	Universities		Polytechnics	
	Males (%)	Females (%)	Males (%)	Females (%)
1999/2000	73	27	79	21
2000/2001	70	30	78	22
2001/2002	71	29	76	24
2002/2003	69	31	76	24
2003/2004	67	33	78	22
2004/2005	65	35	73	27
2005/2006	65	35	70	30

Table 3
Percentage in Total Enrolment for Public Universities and Polytechnics Combined

Years	Universities & Polytechnics	
	Males (%)	Females (%)
1999/2000	75	25
2000/2001	73	27
2001/2002	72	28
2002/2003	71	29
2003/2004	69	31
2004/2005	67	33
2005/2006	66	34

Source: National Council for Tertiary Education, 2006

Several factors including mismatch between existing academic facilities and qualified applicants, limited opportunities for work, study and family management and limited avenues for professional progression for those who divert into vocational and technical education have contributed to limited engagement in further studies. Though some of these factors affect both males and females, these and other factors affect women differently and thereby further limit their access to tertiary education. Women perform triple roles – reproductive, productive and societal/communal responsibilities. They are perceived by society as managers of the home and child minders. Their biological make up make them responsible for carrying babies during pregnancy. Mothers who are not fortunate to have responsible husbands are left with the sole responsibility of ensuring the total upbringing of their children which gives them extra financial responsibilities. These socio-cultural and biological roles affect their ability to leave home management and child care responsibilities for school. Working mothers who dare to pursue academic laurels are faced with the challenging task of combining work, home/child care and studies. If the study is in the face-to-face mode, then they are not likely to have enough flexibility that could meet their life and learning styles. These factors point to the need for alternative modes of delivery of education that will meet the lifestyle of all prospective applicants most especially women.

The ODL Potential for Women

Open and distance learning has proved as a sure way of widening access to education most especially for women. It is an educational philosophy that seeks to overcome/remove all the barriers to education. Open and distance learning could simply be explained as an educational programme that is both *open* and offered at a *distance*. The emphasis is on *open* and *distance*. It is open in the sense that there are no barriers to accessing the programmes. The *distance* also implies that the learner and the teacher could be at a different place and time and engage in an educational transaction using an appropriate media such as print or electronic. There could be a distance learning programme that is closed - that is restricted in terms of entry qualification, selection of courses and assessment procedures. On the flip side, there could also be an open system that is not offered at a distance but only in the face-to-face mode. Such a system could be open in terms of flexibility in entry qualification, selection of courses and combination and assessment procedures but closed or restricted in terms of mode of delivery. Combining the two concepts of *open* and *distance learning* widens the scope of both *distance learning* and *open learning*. UNESCO (2002) has explained that *open and distance learning* refers to approaches to learning that focus on freeing learners from constraints of time and place while offering flexible learning opportunities. For many students open and distance learning is a way of combining work and family responsibilities with educational opportunities. The *open* nature of *distance learning* might be formally institutionalized in such policies as *open admissions*, and *freedom of selection of what, when and where to learn*. The openness of distance learning is also seen in relatively *flexible organizational structures*, patterns of *delivery* and *communication* as well as the use of various *technologies* to support learning (Commonwealth of Learning, n.d.). In open and distance learning, the learner has control over pace, place, time and process. Hence it is often described as learner-centred.

Meanwhile there have been arguments over the extent of *openness* in educational programmes. Spencer (1984) has argued that:

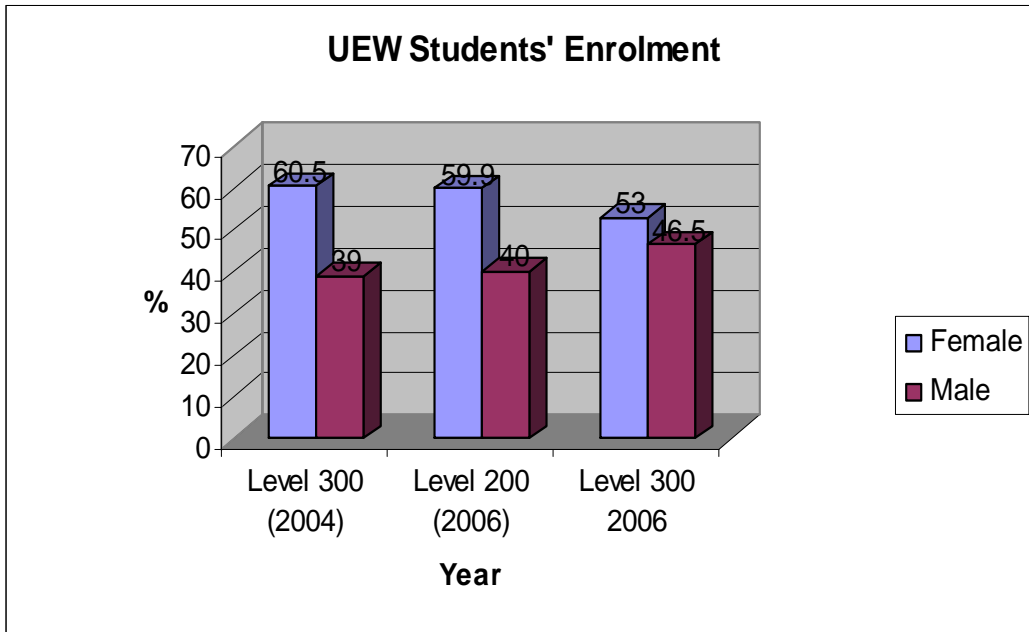
1. since open and distance learning hints on flexibility in delivery and recognizes that students can be at a distance from the teacher and can, therefore, overcome spatial and time barriers and
2. if distance learning seeks to provide:

open and accessible adult education that is open to traditionally excluded individuals and groups,

access to educational resources for those disadvantaged as opposed to individualized education, and

encouraging critical reflection and practical democracy such as workers' self-management,

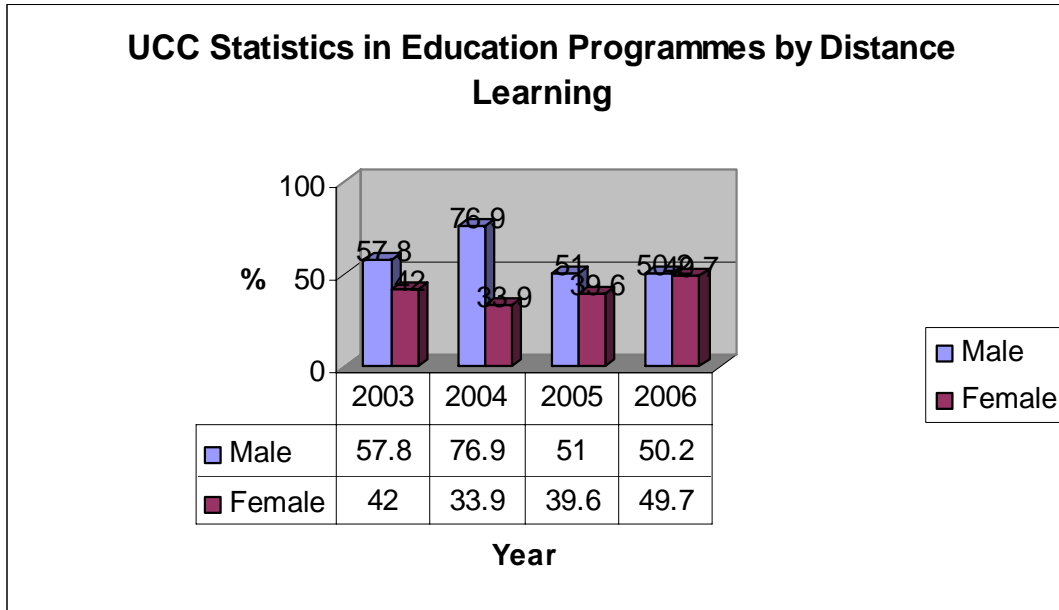
then all the barriers of distance learning itself need to be overcome. Spencer thus argues that openness should be widened to provide accessible and democratic education – education that is accessible to all. This argument is valid. It is challenging to attain total openness in education, whether at a distance or on-campus. For instance the University of Ghana has begun offering its on-campus courses at a distance. As a quality assurance measure, applicants will have to meet the same entry criteria as on-campus students where the University has opened on-campus courses to those who cannot attend face-to-face. Standards are required not only for accreditation, quality assurance and certification but for credibility as well. Open and distance learning which is a variation from on-campus face-to-face education is gradually gaining acceptance and credibility even in academia. Removing all barriers is still a little bit challenging at this stage. Total *openness* may therefore remain a philosophy and a goal for some time until the practice has gained full recognition and credibility especially in the academic and industrial worlds and eventually, society at large.



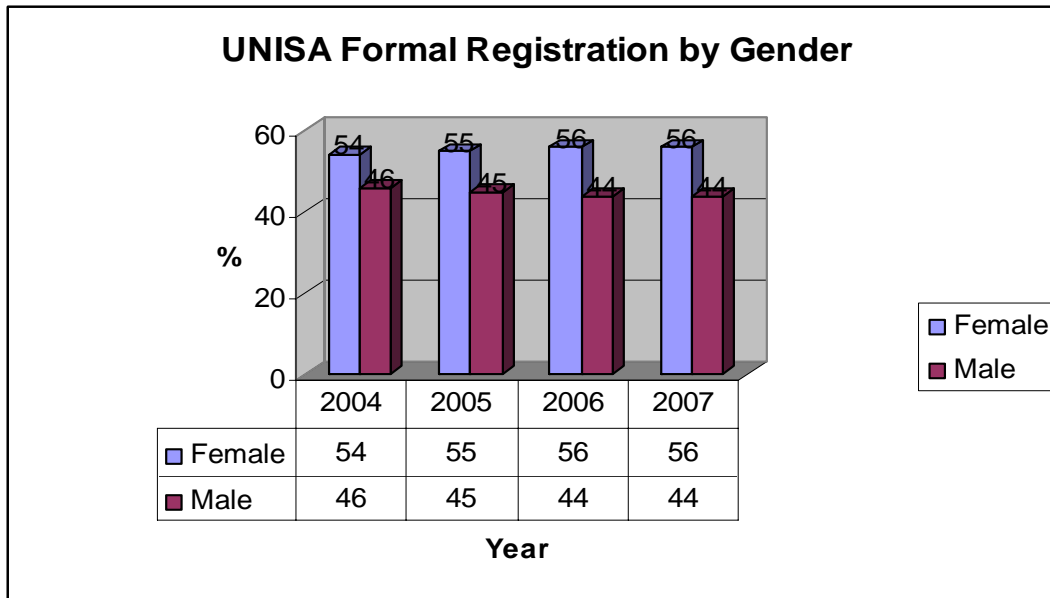
Source: Students' Statistics, UEW (2006)

Even with the limited flexibility most institutions provide with open and distance learning, statistics from various institutions indicate a high percentage of female enrolment in such programmes as compared to on-campus programmes. The University of Education, Winneba which began its ODL programme in 1998 has approximately 7000 students with 53% females and 46.5% males in its Level 300 for the 2006/7 school year. University of Cape Coast which began in 2001 has over 18,000 students of 49.7% females and 50.2% males in the Diploma in Education courses. University of South Africa (UNISA) has over 185,660 students registered in its formal programmes in 2007 out of which 56% are females and 44% being males.

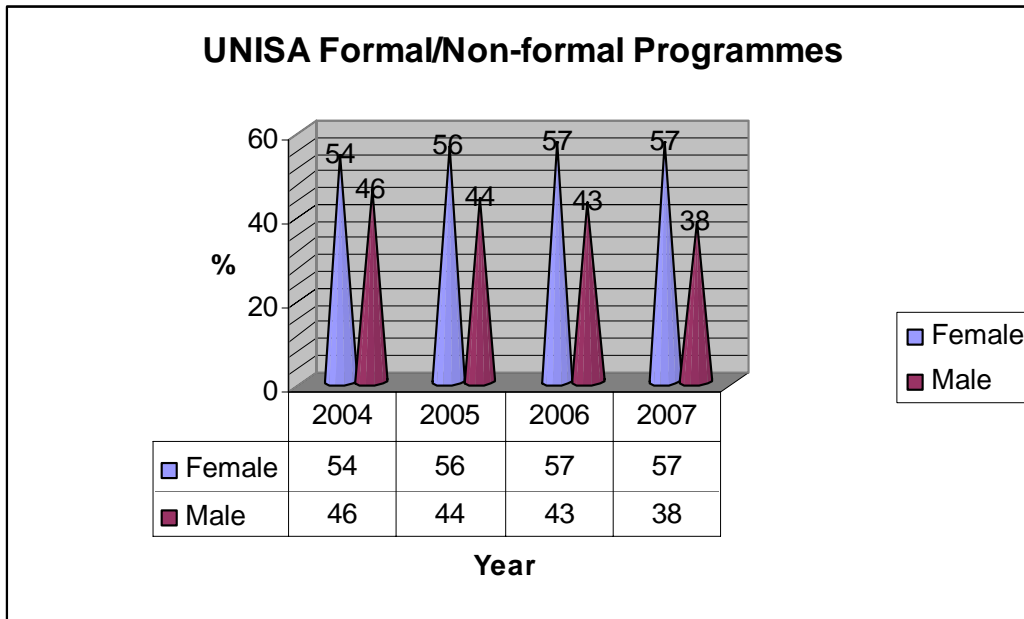
This has been the trend from its 2004 to date records. University of Ghana has just joined the race with a first batch admission of 1128 students for the 2007/8 academic year. The statistics from the various distance education institutions give an indication of a possible attainment of gender parity in education at the tertiary level and, in the case of UNISA, an imbalance is emerging with a higher female percentage. This is the reason for the need to continuously bring to the fore the potential of ODL in promoting higher education especially among women for their empowerment. Detailed statistics from the following institutions could re-enforce the discussion:



Source: Centre for Continuing Education, UCC, 2006.



Source: UNISA, 2007



Source: UNISA, 2007

Meanwhile in the process of harnessing the potential of open and distance learning for women's education, there is the caution to pay attention to course content as well. Phummer (2002) has observed that just as in on-campus programmes, women do not highly subscribe to science oriented courses. Compared to their male counterparts, women mostly subscribe to humanities rather than the sciences. Conscious effort should therefore be made to attract women to the science oriented courses in open and distance learning as well as on-campus.

Some Theoretical Perspectives and its Implications for Women in Open and Distance Learning

This section provides a brief theoretical background to the paper. It is difficult to obtain theories on the interface between women and open and distance learning. In a paper on Research in Distance Education – Past, present and future by Rekkedal (1994), the author observes in the 70's it was quite common that reports from distance education research projects started with a regret for the lack of prior theory or empirical research data. Despite this observation one could admit that progress has been made in developing a body of theory of distance learning. Theories on distance education and the few that are available on women have therefore been reviewed to assess their implication for open and distance learning for women.

Wang (n.d) states that Desmond Keegan (1986) identifies three historical approaches to the development of a theory of distance education. He classified them into the following three categories:

- a. theories of independence and autonomy (Wedemeyer and Moore)
- b. theories of industrialization of teaching (Peters)
- c. theories of interaction and communication (Holmberg)

Theories of independence and autonomy which date from the 1960s and 1970s is argued by Wedemeyer and Moore. It reflects the essential component of the independence of the learner. Otto Peters' work on a theory of industrialization in the 1960s reflects the attempt to view the field of distance education as an industrialized form of teaching and learning. The third approach integrates theories of interaction and communication formulated by Holmberg, Baath, Sewart, and Daniel & Marquis. It is this concept of industrialized, open, non-traditional learning which, Keegan says, will change the practice of education (McIsaac & Gunawardena, 1996). Perraton is another representative theorist in the field. Her contribution to distance education theory lies in her integration of the existing theoretical paradigms with philosophies of education. Her theory

consists of 14 statements or hypotheses that concern education expansion, interaction and communication, and teaching methodology. The utilization of emerging technologies in distance education led to the American theory of equivalency, which seeks to make equivalent the learning experiences of all students no matter their sex and how they are linked to the resources or instruction they require. According to this theory, distance education providers have the responsibility to design instruction that provides learners with equal learning experiences and values (Simonson et al., 2000 in Wang, n.d.).

The wide range of theoretical notions which have provided a richer understanding of the learner at a distance have several implications for open and distance female learners. Research on gender issues in ODL has recently received some attention. Most of this research examines questions concerning student profiles, learning styles, needs, recruitment, and drop out among female students. Authors like Phummer, Rekkedal, and Kanwar and Evans, among others, have also been pursuing studies on women and distance learning. These studies help to assess the situation of women in ODL programs to find out the interface between the various theories and women who engage in ODL programs.

Kirkup and Phummer have questioned the universality of the notion of *independent* or *autonomous* learner. Based on the results of their comparative work on female and male learners in the British Open University and the German FernUniversitat, the authors suggest that the notion of the *connected* learner more accurately takes account of women's learning styles. As a result, they have explored the implications of the difference in men and women's learning needs and the kind of support systems that should be designed for male and female distance learners (Rekkedal, 1994).

Meanwhile, using a post-modern framework, a study by Wall (2004) sought to explore the notion of solitude among women distance education students and found that, in contrast to the feminist view that women have a high need for interactive method of learning as opposed to solitary knowledge-building, there are some women distance education learners who, in addition to learning in a collaborative environment, have the skills and confidence to learn in a solitary environment. Thus, learning in solitude is not as detrimental as some authors contend. The study has therefore challenged the general notion that women learn best in an interactive rather than solitary environment. The factors which seemed relative to these perspectives were time, choice, course load, individual preferences, and discomfort with technology.

This observation leads to the applicability of the concept of independence and learner control in ODL for women. Though the conclusion of the study by Wall (2004) does state categorically that all women have the ability to learn in solitude, and also quickly adds that they are able to learn in solitude in addition to engaging in collaborative environment, the study firms up the concepts of learner independence, learner autonomy, and learner control in distance learning for women. Independence and learner control is a theoretical construct that has received attention in the distance education literature. Studies which examine locus of control (Altmann & Arambasich, 1982; Rotter, 1989 in McIsaac & Gunawardena, 1996) conclude that students who perceive that their academic success is a result of their own personal accomplishments have an internal locus of control and are more likely to persist in their education. Students with an external locus of control feel that their success, or lack of it, is due largely to events such as luck or fate outside their control. Thus, those with external locus of control are more likely to become drop-outs. This implies that much as the inner desire to achieve and therefore earn to succeed on educational programs could drive women to stay on distance learning programs, support systems cannot be taken for granted. Probably the inner drive will push students to get on board, while the support systems will sustain them on the programs. The inner drive and the support systems that adhere to the principles of guided didactic conversation could therefore be the sustaining elements of women in ODL programs.

The social context in which distance learning takes place is emerging as a significant area for research. Theorists are examining how the social environment affects motivation, attitudes, teaching, and learning. The experiences of women make them perceive the world differently from men. As a result of the influence of their roles in society, their encounter of the world cannot be the same as that of their menfolk. Rekkedal (1994) discusses that some feminist theorists advocate a distinctive sociology for women that draws on their everyday experience, enabling them to arrive at an understanding of a social world where power is held by men. Smith (1990:13) in Rekkedal is quoted to contend that "the worlds of men have had, and still have, an authority over the worlds that are traditionally women's and still are predominantly women's—the worlds of household, children, and neighbourhood." This observation represents a radical departure from the theories, methods, and subject matter of traditional, male-centered sociology. According to this argument, women in academic settings face a disjunction between their own life experience and established bodies of knowledge that reflect a male point of view. The thinking is that the existing theories and methods of ODL may be confusing for women who study at a distance and are physically removed from the university community. Perceived and conceived by men in the world of men, the packages of objective, factual material, activities, and exercises of modules that are sent to open and distance learners may have little direct bearing on the social worlds of women. As a result, gender advocates have pushed for and introduced alternative approaches to learning that fits into the social context of women and as a result encourage women to explore their own direct experience in order to understand their society better.

To create gender sensitivity in course development, course delivery, administration of ODL, and all other processes, Rekkedal has proposed that questions be asked differently and also that our perceptions be reviewed. For instance:

- How do adults learn? should become How do women and men learn?
- What sort of support do learners need? should become What sort of support do men and women need?
- What sorts of conditions must we create for learners at a distance so that the open door stays widely open? should become What sorts of support do women and men need in order to succeed as distance learners?
- Instead of worrying over what sorts of programs will meet the needs of our potential—and generic—learners, we should be asked whether our course materials enable women as well as men to make sense of their experiences, to find their voice and to take positive action in and on their worlds.
- Rather than urging on our colleagues the latest technology for connecting learners with teachers and with each other, we are asked to consider whether these technologies are equally available to women and men, and whether women and men are likely to approach and experience these technologies in the same way (Rekkedal, 1994).

Media use for facilitating guided didactic conversation in ODL has gained currency in the analysis of the theories in distance learning. The development of new technologies has promoted an astounding growth in ODL, both in the number of students enrolling and in the number of universities adding education at a distance to their curriculum. Meanwhile, there are issues that need to be critically assessed to be able to make the best use of information and communication technologies in ODL for women. The first issue is that, while the application of modern technology may enhance ODL, literature in the field reveals a conceptually fragmented framework lacking in both theoretical foundation and programmatic research. The interface between the male and female learner, the instructor, and the technology needs to be explored to find out how the instructor, the learner, and the technology collaborate to generate knowledge.

Another issue is the ability to obtain social presence in the use of information and communication technologies in teaching learning engagements. Though there has been a widespread notion that technology is culturally neutral, and can be used easily in a variety of settings, it has been realized that media, materials, and services are often inappropriately transferred without paying attention to the social setting or to the local recipient culture. That is, technology-based learning activities are frequently used without attention to the impact on the local social environment. Computer-mediated communication attempts to reduce patterns of discrimination by providing equality of social interaction among participants who may be anonymous in terms of gender, race, and physical features. However, there is evidence that while some anticipated users may not have access at all, the social equality factor may not extend to participants who may not be competent in the language of the computer. A consideration of the traditional settings is therefore necessary. Social presence is a factor that is particularly significant to open and distance educators. Learners need to feel a high degree of presence in a mediated situation (Fontaine, 2002). In a study of learners in an interactive television class, it was found that cues given to students—such as encouraging gestures, smiles, and praise—were social factors that enhanced both students' satisfaction and their perceptions of learning (McIsaac & Gunawardena, 1996). Since an interactive environment meets the learning styles of women, the conscious effort to create social presence in technology-mediated learning could be a way of making information and communication technology women-friendly.

The theories have different implications for women and men who study at a distance. On the construct of the independence of the learner, it could be observed that in view of their differential roles, experiences, and perspectives, men and women engage differently in any teaching-learning endeavor. Probably as a result of the inability to find enough space to engage in intensive studies, which could result in limited confidence, women are not able to amass a high level of autonomy and independence in their studies. Though current studies have proved that women can learn in solitude, there is still the need for gender-specific support systems to create opportunity for interaction among women.

Guided didactic conversation, though it could be most suitable and very supportive in meeting women's learning styles, its excessive use probably could not be very helpful for women to build and claim their self-autonomy and independence in their learning engagements. Women require some space to make the effort to explore and be responsible for their own learning and intellectual development.

One instrument that has been widely used to bridge the time and space and to promote didactic conversation is information and communication technology. As much as it has been strongly argued that information and communication technologies have tremendous potential for overcoming most of the barriers women face in distance learning, women are not generally seen to be technology-friendly. Creating a high level of social presence in information and communication technologies will not only meet women's learning styles or merely enhance interactivity, but will facilitate didactic conversation as well.

Conclusion

The potential of open and distance learning in widening access to tertiary education for women is tremendous. In view of the need to use higher education to facilitate development and for that matter women's empowerment several efforts (such as expanding educational infrastructure and affirmative action to reduce the qualifying aggregate by one for women) have been made to enable existing polytechnics and universities increase their intake. Though these efforts have contributed to modest increase in enrolment, the norm of attaining 50:50 male-female ratio is yet to be

achieved. This is as a result of growing mismatch between the existing tertiary educational facilities and the large number of qualified applicants in addition to limited opportunities for recurrent education and lifelong learning.

Statistics from open and distance learning institutions confirm the potential of open and distance learning in achieving parity in education between males and females. Theories of distance education has also outlined the underlying principles for using open and distance learning for educating women. The onus is on policy makers, development partners/workers and educators to harness the full potential of open and distance learning for women in higher education.

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