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

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Table of Contents – November 2008

	Page
<i>Editorial: New Challenges for Public Education in the USA</i> <i>Donald Perrin</i>	1
<i>Developing Discipline-Based Critical Thinking Skills</i> <i>Via Use of Interactive Technologies</i> <i>Ayse Kok</i>	3
<i>Students' Perceptions of YouTube Usage</i> <i>in the College Classroom</i> <i>Shonna L. Snyder, Sloan Christine Burke</i>	11
<i>Faculty and Learner Interaction in Online Courses</i> <i>Peter Kiriakidis and Angie Parker</i>	25
<i>Hybrid Learning and the Principles of Good Practice in</i> <i>Undergraduate Education</i> <i>Allan E. Young, Devon C. Duhaney</i>	35
<i>An Analysis of Australian Students' Use of Information and</i> <i>Communication Technology (ICT)</i> <i>Ardi Marwan</i>	45
<i>Zambian School Administrators and Teachers Speak Out:</i> <i>"The Challenges Are Too Many"</i> <i>Carolyn M. Thomas</i>	55

Editorial

New Challenges for Public Education in the USA

Donald G. Perrin

There are five steps in decision making. 1) define the problem, 2) determine *alternative* solutions, 3) set criteria, 4) evaluate alternatives, 5) choose “best” alternative. If there is only one way to do something, there is no decision to be made. In traditional systems of education, there is often only one way, or only one “right” way. This kind of linear thinking has enabled education to survive for the past century with only minor changes. However, results tell us that our tools and methods and educational products are less and less relevant for the needs of the 21st century. Public schools in the United States now perform lower than most industrialized countries, especially in science and math. There is a shortage of credentialed teachers, shortage of textbooks, reduced attendance, a lower percentage of students graduating from high school, and low literacy rates. With the economic downturn, public education is suffering substantial budget cuts, and some privately funded colleges and universities are talking about bankruptcy.

When businesses do not respond to market changes, they fail. Successful businesses need to constantly reinvent, or even *transform* themselves to maintain or grow their market share. Large and successful corporations have lost relevance and faced bankruptcy even in good economic times. Successful transformation requires reinvention, innovation, and even paradigm shifts to adapt to the changing world.

This is true for education also. The century-old industrial model is threatened by social and economic changes, and by technologies that have revolutionized the way in which people communicate and live. In response to these changes, education must constantly 1) *redefine* needs and opportunities, 2) research available solutions, 3) rigorously evaluate alternatives, and 4) find multiple solutions and 5) select the best alternatives, probably more than one, to support a wide range of educational needs.

Problem solving requires two steps beyond decision making: 6) implement the decision and 7) evaluate results. By continuous exploration and evaluation of new methods and technologies, we can generate a learning community focused on continuous quality improvement.

With the new economic pressures, it is time for serious examination of alternative ways to achieve local and national education objectives in two major categories:

- **Child learners** in preschool and in kindergarten through twelfth grade. Schools and auxiliary organizations are also responsible for child supervision while parents are at work.
- **Adult learners** in universities, colleges, adult education programs, and organizations with internal training programs. Adult learners are responsible for managing their time, their learning, and their lives. They have other responsibilities such as jobs and families.

Options for Child Learners: Budget cuts are eliminating teachers and administrators. This compromises an already lean system for child education. However, the problem may define the solution. With many adults out of work, including persons with higher degrees and professional skills, the educational setting could be reorganized to make productive use of parents and the skill-sets they bring. This could enhance all aspects of education, training and supervision. The question is how to pay them, or how many could afford to volunteer their services.

Volunteers may not be suited – or qualified - for traditional delivery from the front of the classroom, but they can perform tasks under the direction of a teacher: prepare materials, lead or

participate with children in small group activities, and provide logistical support. Some parents might elect to take courses in teacher training. In American classrooms, persons with Bachelor degrees and six weeks of teacher training can teach. In other words, there is already in place a mechanism to rapidly advance the most qualified people into a classroom setting.

This does not provide the needed paradigm shift to make teaching and learning relevant to 21st century needs, but it does bring in new people and ideas to continue operation while educational leaders prepare for change.

Options for Adult Learners: Education is no longer bound by the walls of the classroom and traditional methods of teaching. Distance learning via television and/or computers is a logical way to serve the deluge of persons requiring education and training for available jobs and jobs that will come available in the foreseeable future. On-campus classes would focus on jobs and professions that require special equipment or close supervision. This would extend the footprint of education and training into homes and businesses throughout the community.

Distance learning may solve the problem of learning spaces, but it requires budgets for teachers, technology, and tuition support. Also, it is important to match trainees and students to real jobs as the economy recovers.

What about Transformation? The above are stop-gap measures. Public education should not be a victim of economic collapse, but part of the solution. As industries reinvent themselves to be relevant, so must education. The solution begins in teacher training institutions - a bastion of conservatism in a world that changes at an ever increasing rate. There is a spark of genius in Charter Schools and Innovative Schools of various kinds, but a model has yet to emerge that is distinctly superior, affordable, and replicable on a large scale.

Business and industry have attempted to transform education through a large scale infusion of funds and technology and by managing education as a business. Hopefully the pages of this journal will be a window to share innovations and new learning sciences that will transform education as an engine of growth and prosperity. Here are the 10 most read articles during 2008:

- 1 [**Connectivism: A Learning Theory for the Digital Age**](#)
George Siemens
- 2 [**Tips and Tricks for Teaching Online: How to Teach Like a Pro!**](#)
Kaye Shelton and George Saltsman
- 3 [**Brain-Based Learning: Possible Implications for Online Instruction**](#)
Stephanie A. Clemons
- 4 [**Wikis and Wikipedia as a Teaching Tool**](#)
Piotr Konieczny
- 5 [**Time Management Strategies for Online Teaching**](#)
Min Shi, Curtis J. Bonk, Richard J. Magjuka
- 6 [**Comparing Weblogs to Threaded Discussion Tools in Online Educational Contexts**](#)
Donna Cameron, Terry Anderson
- 7 [**Learning Objects: A Practical Definition**](#)
Rory McGreal
- 8 [**Critical Thinking in Asynchronous Discussions**](#)
Greg Walker
- 9 [**The Open University Malaysia Learning Management System: A Study of Interaction in the Asynchronous Forum Board**](#)
Syed Abdullah Syed Othman, Hanafi Atan, Cheah Kooi Guan
- 10 [**Creating Concept Maps: Integrating Constructivism Principles into Online Classes**](#)
Brent Muirhead

You are invited to submit articles related to innovations that will support the transformation of education.

Editor's Note: Ayse Kok has described a powerful process for developing the critical thinking skills of students. The editors look forward to validation of these premises in future research.

Developing Discipline-Based Critical Thinking Skills Via Use of Interactive Technologies

Ayse Kok
UK

Abstract

One of the education's major goals and valuable outcomes is critical thinking, the cultivation of which is seen as a core intellectual virtue. Within the realm of social sciences where there is a gamut of information resources, developing discipline based critical and analytical thinking skills is essential to cope with the information overload. The goal of this paper is to establish a clear link between the use of new technologies in social sciences and the development of critical thinking skills. Online dialogues based on the externalist model of critical thinking, wikis, concept maps, case studies, role-playing, simulations, streamed video, chat rooms, bulletin boards, online references have been suggested as possible solutions.

Introduction

Learning in a world where traditional assessment of intelligence are radically changing and abundant knowledge is more readily available due to the proliferation of information communication technologies (ICTs) has become a challenge. Yet, without focusing on how the technologies may provide the learners with critical thinking and analytical skills rather than the mere delivery of information may result in the mirroring of traditional didactic approaches on the technology. Especially, within the realm of social sciences where there is a gamut of information resources, developing discipline based critical and analytical thinking skills is essential to cope with the information overload. The goal of this paper is to provide a clear link between the use of new technologies in social sciences and the development of critical thinking skills.

The paper starts with a basic characterization of critical thinking along with the underpinning theories and then moves into a discussion about the possibilities of conveying critical thinking skills in social sciences via use of new technologies.

Characterization of Critical Thinking

Critical thinking can basically be considered as being able to distinguish the true from the false. Despite being central to both intellectual and social progress, critical thinking is in short supply (van Gelder, 2001).

Bogdan (2000) defines critical thinking as "a unique kind of purposeful thinking in which the thinker systematically and habitually imposes criteria and standards upon the thinking....".

According to Dewey (1933), reflective thought should be 'active, persistent', and should entail 'careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusion to which it tends.' Similarly, critical thinking should include the evaluation of the worth, accuracy, or authenticity of various propositions, leading to a supportable decision or direction for action.

As it has been stated in the 1980 California State University Executive Order which announced for the first time the requirement of formal instruction in critical thinking (Dumke, 1980), critical thinking emphasizes mental attitudes of "analyzing, criticizing and advocating ideas and

reasoning inductively and deductively and reaching factual or judgmental conclusions based on sound inferences drawn from unambiguous statements of knowledge". Similarly, Jones et al. (1995); Paul, Elder, Bartell (1997); Perry (1999); Ennis (2002); and Lampert (2005) define critical thinking as recognizing differing viewpoints, being analytically reflective and willing to increase sources of information as well as generating meaningful questions to formulate plausible conclusions.

These traditional definitions of critical thinking are based on an internalist point of view that packs everything relevant to the evaluation of an intellectual product into the consciousness of an individual (Cohen, Adelman, Bresnick, Marvin, Salas, Riedel, 2004). Accordingly, critical thinkers maintain conscious and deliberate access to the reasons for their beliefs and actions. On the other hand, the externalist point of view favors strategies related to intuitive and recognitional processes which may be more reliable for achieving goal in familiar situations or when time is limited (Cohen, Adelman, Bresnick, Marvin, Salas, Riedel, 2004). This view focuses on the reliability of different types of processes for generating beliefs under different circumstances.

Freire (1987) asserts that critical thinking can occur through the reciprocal process of connection, questioning and interaction among teachers and learners rather than depositing knowledge in the heads of students. So, a critical thinker should be able to differentiate between fact and opinion, examine the assumptions, be flexible and open-minded be aware of fallacious arguments and stay focused on the big picture. According to Meyers (1986), critical thinking is a learnable skill and students can collaborate to enhance their thinking. Meyers (1986) also asserts that while courses should be assignment centered rather than text oriented goals should emphasize the use of content rather than simply its acquisition.

According to the constructivist framework, learning is an individual construction within the learner's environment. As Savery & Duffy (1995) state, two of the main objectives of the instructional principles derived from constructivism are to encourage testing ideas against alternative views and contexts and to provide the opportunity for reflection on the content learned and the learning process. These principles are also related to developing critical thinking skills.

With regard to the acquisition of these cognitive skills, it has been asserted throughout the literature that critical thinking skills can be improved with practice under the following conditions (van Gelder, 2001):

- Motivated: The student should be motivated to improve the critical thinking skills.
- Guided: The student should be informed about what to do next.
- Scaffolded: Structures should be provided to prevent inappropriate activity especially during the early stages.
- Graduated: The complexity of tasks should gradually increase.
- Feedback: The students should be provided with feedback about the appropriateness of their activities.

One of the main challenges of teaching of the critical thinking skills is that skills acquired in one domain or context may not transfer to another one. In order to overcome this problem of transfer, students must extensively practice transferring their skills over other contexts (van Gelder, 2001). This approach of teaching general thinking skills is in contrast with the situated cognition perspective which asserts that as all thinking is tied to specific concrete situations learning cannot transfer to remote contexts. Yet, by utilizing computers, guidance, feedback and scaffolding, learner activities regarding the critical thinking skills might be improved.

Within the context of online learning, teaching the learner critical thinking skills means more than the critical analysis of online resources. As knowledge is best transferred when it is

contextualized into the content familiar to the learner, inquiry based instruction with real world applications in a collaborative setting would present the best opportunity for teaching critical thinking skills. Examples of this approach would be a collaboratively designed online class with instructors from various discipline areas proposing real-life problems that the students may jointly solve.

Critical Thinking within the Realm of Social Sciences

According to Meyers (1986), instead of teaching critical thinking as an independent subject where the students are taught to master formal paradigms of reasoning, critical thinking should be incorporated wholly into the study of individual disciplines. Treating the courses in formal reasoning as being indispensable for a study of the arts and sciences similar to a medieval curricular practice may not provide by themselves the students with the wide range of specific critical skills appropriate to the study of the social sciences (Meyers, 1986). Rather, in order to teach critical thinking skills, “discipline-related frameworks for critical thinking” which can be defined as the distinctive conceptual structures and methodological norms that guide inquiry and shape theory in a given discipline should be transmitted (Meyers, 1986). As there is no unified critical methodology or a single procedure for teaching critical thinking skills in social sciences Meyers (1986) suggests that based on the related intellectual culture and context a “step-wise approach” to the development of analytical skills can be followed. To exemplify, a series of short, carefully targeted and complex writing assignments may be given throughout the semester.

Moreover, idea generation can be fostered through the bulletin boards in online learning environments by coaching the discussions to take the students' ideas to the next level and more intellectual learning whereas the presentation tools can be used for group projects. This kind of collaborative learning in pairs or groups with shared goals may promote critical thinking of the social science students. Yet, as not all of the students may possess critical thinking skills to advance an online discussion or all the faculty members may have the required expertise in monitoring the online discussions and creating productive communities of online learning support and training may be required.

As Sugar and Bonk (1998) stated peer collaboration and interaction may not necessarily trigger reflection on one's ideas. Reflective and substantive exchanges between social science students can occur if the faculty members can stimulate the discussions by asking probing questions, encouraging participation, holding them responsible for their thinking and coaching the students about collaborative learning. As asynchronous conversations allow for greater reflection via giving feedback students should also be made aware of the significance of their answers and learn to respect each others' ideas and construct their own understanding. In order for the students to recognize their own assumptions and the implications thereof, and use their knowledge in the exercise of judgment, they should be asked critical thinking questions by the faculty members. A sample of this type of questions that may influence the depth of thinking of the students is shown in Table 1.0.

Furthermore, in order to practice critical thinking within the online learning environments, small group discussions about a particular reading, case discussions using simulated complex problems for analysis, debating teams or mock trials where students assume various roles may be utilized. These online collaborative formats aiming at students' reflection, debate and interaction can effectively make the students go beyond being merely exposed to content and critically interact with it if the faculty members practice modeling reflective conversations, coaching, questioning and task structuring.

In order for the Internet to be used more than as a platform for the course content and as a communication medium for online-discussions, Kanuka (2002) suggests that the following teaching principles be applied to facilitate higher levels of learning.

Table 1.0
Principles of Teaching and Learning (Adapted from Kanuka)

<i>Principle</i>	<i>Constructs</i>
<i>Principles of Teaching</i>	
Active and purposeful <i>engagement with abstracted phenomena</i>	<ul style="list-style-type: none"> • Complex problems • Interactive • Repertoire
<i>Multiplicity of perspectives to be fully apprehended</i>	<ul style="list-style-type: none"> • Multidisciplinary • Conflicting phenomena • Multiple sources
<i>Relatedness for meaningful understanding</i>	<ul style="list-style-type: none"> • Creditable source • Authentic event • Discursive
<i>Diversity of instructional methods</i>	<ul style="list-style-type: none"> • Inquiry based • Problem solving • Decision making
<i>Principles of Learning</i>	
<i>Assume greater responsibility</i>	<ul style="list-style-type: none"> • Setting standards of excellence • Learning/thinking strategies • Focus efforts
<i>Meaning-making into abstracted phenomena</i>	<ul style="list-style-type: none"> • Making sense • Generating relationships • Reflective deliberation
<i>Reconstruction of meanings</i>	<ul style="list-style-type: none"> • Empathy • Negotiable meanings • Diversity

Table 2.0
Principle Based Strategies for Teaching and Learning (Adapted from Kanuka

<i>Principle</i>	<i>Strategies</i>
<i>Principles of Teaching</i>	
Active and purposeful <i>engagement with abstracted phenomena</i>	<ul style="list-style-type: none"> • Case study • Group work • CMC
<i>Multiplicity of perspectives to be fully apprehended</i>	<ul style="list-style-type: none"> • Online databases • Hypertext links with annotations • Sequenced content databates
<i>Relatedness for meaningful understanding</i>	<ul style="list-style-type: none"> • Application to personal context • Press conference/debate with expert • Guided discourse
<i>Diversity of instructional methods</i>	<ul style="list-style-type: none"> • Open-ended questions • Online links to related resources • WebQuests • Problem-based learning • Internet search and critique • Delphi technique
<i>Principles of Learning</i>	
Assume greater <i>responsibility</i>	<ul style="list-style-type: none"> • Self-assessment rubric • Prioritizing of activities • Collaborative projects • Presentations • Hypertext patterns • Learners' goals/objectives
<i>Meaning making into abstracted phenomena</i>	<ul style="list-style-type: none"> • Antithetical questions • Reflective activities • Interpreting database information • Constructing classification systems • Comparing experience with information • Scaffolded discussion
<i>Reconstruction of meanings</i>	<ul style="list-style-type: none"> • Online role playing • Peer support activities • Heterogeneous groupings • Online brainstorming • Synchronous CMC

- Engagement with complex abstracted phenomena: Active and purposeful engagement can occur if the following constructs are available:

- Complex problems: Problems that are ambiguous and don't present one right solution to the learner should be presented.
- Interactive participation: Use of collaborative learning strategies is necessary for the intellectual participation between the learners and instructors.
- Strategic choices: Alternative teaching methods is essential for engaging learners in problem-solving.
- Multiplicity of perspectives: In order to present diverse perspectives about problems the following constructs should be made available:
 - Multidisciplinary approaches: Making use of several disciplines at once is essential.
 - Conflicting phenomena: This requires the presentation of two or more occurrences that are contradictory.
 - Multiple information sources: Information sets with diverse perspectives on an issue should be utilized.
- Relatedness: Phenomena that has relevance to learners must be involved and this principle has the following constructs:
 - Credible authority: Phenomena should be presented by a credible authority in the field.
 - Actual event: Phenomena should be related to an actual event.
 - Guided discourse: Meaningful understanding should proceed through a guided reasoned discourse.
- Diverse ways of knowing: This principle has the following constructs:
 - Inquiry based learning: A close examination in a quest for knowledge should occur.
 - Decision-building learning: Position, conclusion, passing of judgement on an issue after evaluating the alternatives and assessing the consequences are essential steps in learning.
 - Problem-based learning: Explaining, deciphering and resolving an ambiguous problem is required of the learner.

Similarly, Kanuka (2002) suggests that the following learning principles should be taken into consideration:

- Responsibility: This principle has the following constructs:
 - Set standards of excellence: Defining benchmarks and selecting meaningful learning activities to address the phenomena presented are crucial for achieving excellence in learning.
 - Thinking/learning strategies: A repertoire of thinking is essential to apprehend the multiplicity of problems.
 - Focus efforts: Learners should focus their efforts on evaluating their own weaknesses and strengths.
- Meaning making: This principle has the following constructs:
 - Making sense: Learners should compare, classify, induce, deduce, analyze and evaluate to make sense of data presented.
 - Generate relationships: Learners should transform, reshape or reinterpret new information through a different scheme.

- Reflective deliberation: To conceive ideas and draw inferences learners should get engaged in critical dialogue.
- Reconstruction: Understanding that their own world view is not necessarily the correct one requires the presence of the following constructs:
 - Empathy: Learners should develop the ability to reconstruct meanings to understand others' worldviews.
 - Negotiable meanings: Reshaping existing knowledge through negotiation with others may lead to higher levels of thinking.
 - Diversity: By valuing diversity learners can achieve shared understandings.

Within the light of this information, in order to convey critical thinking skills, the instructors must focus on teaching the process of information discovery within the learner's own contextual meaning. This may be realised when the learners themselves select their own path of inquiry, get introduced to the necessary new technologies such as Web 2.0 based online collaboration tools when required and interact in the online setting in such a way that requires a high level cognitive involvement in order to self-construct their knowledge. To exemplify, students in a social science course could collaboratively author a paper similar to the process undertaken by professional researchers to publish their research in a peer-reviewed form. Students can choose an existing topic or propose a new topic for addition to the site. Before their work is peer-reviewed and published, each group may be given a private wiki page for drafting their outline and taking notes. After the initial draft they can use the wiki as a collaborative writing space whereas the teacher can check their notes to ensure that they are on the right track. The peer-review group can post comments on the wiki page so that these can also be incorporated into the original work before the publication. In this way, the students may feel motivated to publish a high quality product and the teacher can assess their work and provide guidance throughout the whole publication process. By sharing ideas online and getting feedback, the social science classrooms can become a meeting place for the generation of new ideas.

Using wikis in social sciences will make the knowledge construction process transparent and provide the establishment of a learning community. Bransford, Brown & Cocking (2000) states that direct cognitive and socio-collaborative support for group members' efforts may be provided through a community of practice whereas the learners distribute their intellectual activity so that the burden of managing the whole process does not fall to any one individual.

As van Gelder (2001) states, a co-learning approach to hypertext expands critical thinking to involve the examination of various viewpoints and assumptions. By following paths throughout the hypertext web, students can keep track of their thinking processes reflectively and add new associative paths into the collaborative spaces by merely clicking the mouse. Similarly, Taylor (2006) asserted that by creating hypertext links students' learning experiences may become messy which is, in fact, indicative of the complicate process of meaningful learning. Complex, multi-linear and inter-textual learning dispositions provide not only the opportunity for finding and making connections and reflecting upon the validity of these connections but also make the students discover that learning is in a constant state of change and growth rather than static (van Gelder, 2001). Furthermore, with regard to online learning, the learning environments must possess an appropriate instructional design to support the students in developing their point of view and being critical. Yet, online education has often become an industrialized process of teaching and learning where students are not encouraged to apply knowledge in a variety of ways. A shift from the Fordist approach of learning that views learning as standardized and bureaucratic processes to a Post-Fordist approach where learning is seen as tailored products using decentralised approaches and learner-centered models may also provide the opportunity for online learning to improve critical thinking skills.

Moreover, by offering ways for collaboration via synchronous and asynchronous discussions critical thinking may become more advanced in online learning than in traditional education. According to the externalist approach to critical thinking, asking and answering questions about alternative possibilities in order to achieve an objective may improve the quality of dialogues (Cohen, Adelman, Bresnick, Marvin, Salas, Riedel, 2004). By asking and answering questions, the defender and challenger may introduce new possibilities and learn each other's beliefs. The referee who represents an external perspective regulates the dialogue so that it reliably achieves the participants' objectives within the available time (Cohen, Adelman, Bresnick, Marvin, Salas, Riedel, 2004). In this way of critical dialogue, deciding how to resolve a disagreement, challenging and defending positions and reaching a resolution may become easier for learners (Cohen, Adelman, Bresnick, Marvin, Salas, Riedel, 2004). Applying this type of small group online discussions may lead to the enhancement of critical thinking skills.

Additionally, use of case-based reasoning, flowcharts and concept maps, minute papers, problem-based group learning all may be used to further promote critical thinking in online environments. So, case studies, role-playing, simulations, streamed video, chat rooms, bulletin boards, online references can facilitate an interactive online learning environment. These activities can foster group problem solving and hence encourage critical reasoning more than the traditional classroom instruction. Another way for fostering the critical thinking skills in online courses may be by use of concept maps of the understanding of the concepts addressed in the online discussions as Novak and Gowin (1984) suggest. Based on Kolb's learning type of concrete experience and active experimentation, concept maps support the learners in processing and generating information and self-assessing their thinking processes. By looking at the concept map and thinking back to the online discussion, the learners can see the relationships between the concepts they read and the online discussion.

Conclusions

Needless to say, each day we are getting exposed to a vast amount of information at an increasing rate. Similarly, social science students are expected to increase their knowledge base due to the information readily available. Yet, to build on what they already know requires critical thinking. The social science students must develop skills to not only examine logical relationships between statements but also construct arguments, respect different points of views and be flexible to change their way of thinking if reason leads them to do so. By actively conceptualizing, analyzing, synthesizing and evaluating information, an intellectual excellence can be achieved. The social sciences faculties can contribute to this intellectual growth by especially making their students engaged in online discussions and presentation tools.

It is the researcher's belief that by making students conveyors of their ideas via use of these interactive technologies and collaborative dialogue, their ability to analyze, synthesize and evaluate solutions to real-life problems may be improved. Critical thinking happens in the use of problem solving skills, creativity and dialogical interaction that lead to the challenging of assumptions and theory generation. So, by designing online courses from the bottom up that use the university's computer networking infrastructure (which allows the opportunity for peer-to-peer dialogues as well as entail an online university speaker series), social science departments may enhance the critical thinking skills of their learners.

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Editor's Note: This research promotes use of YouTube technology to offer a challenge and reward to both instructors and students. A follow-up study would be useful to further validate the author's positive results.

Students' Perceptions of YouTube Usage in the College Classroom

Shonna L. Snyder, Sloan Christine Burke

USA

Abstract

Including Internet technologies such as YouTube in the classroom is imperative to meeting the educational needs of the young adult generation. There have been few studies conducted on student perceptions of using YouTube in the classroom. The purpose of this study was to explore student perceptions of YouTube as an effective teaching tool within a sample general health course in a midsized southeastern university. A sample of 810 students completed an online survey regarding their perceptions of YouTube as a learning tool. The results of this study reveal that students are using YouTube at a high rate and that they desire instructors to use YouTube in the classroom. Recommendations are made for incorporating YouTube in the classroom.

Key words: Internet, Web 2.0, communication, education, students' perceptions, YouTube, technology, E-learning, Learning Resource, online, distance education, video, distance learning, classroom, students, secondary education, higher education, college.

Introduction

Technology in the classroom has come a long way since the days of simply showing a video or using the overhead projector. The fast paced advances in video technology and communication tools brought on by the Internet in the past decade have caused educators to consider their benefits as classroom tools. The Web 2.0 generation, those who access the Internet more and use it as a platform for communication and social networking (Downes, n.d.; PEW Internet & American Life Project, 2007), is already using this technology on a day-to-day basis and, therefore, including these tools in the classroom is imperative to meeting the educational needs of these faster-paced, web savvy learners (PEW Internet & American Life Project, 2007).

Founded in 2005, YouTube has quickly become a communication platform on the Internet that the Web 2.0 generation is using daily. YouTube is an Internet application in which people can upload, share, and watch videos. There are millions of messages being uploaded each day onto this forum (YouTube, 2007). Instructors, who use creative teaching strategies that incorporate innovative technology such as YouTube, motivate and engage learners who are technology savvy and are accustomed to the online environment. By using a variety of instructional methods and learning activities in the classroom or via distance education courses, an enriched learning environment is created for the student (Beldarrain, 2006). YouTube is an innovative approach to deliver instruction using video, computer and Internet technologies.

Internet programs seem to have the advantage of evolving quickly and delivering timely information (Palmer, Graham, & Elliot, 2005). Internet-based resources like YouTube have the ability to integrate relevant content and encourage learners to reflect on how the material can be applied to many different settings. This speaks to the fast-paced learning style of younger learners that frequently use the Internet and YouTube (Educause, 2006; Lee & McLoughlin, 2007).

According to the PEW Internet & American Life Project (Jones & Madden, 2002), college students are using the Internet at much higher rates compared to other populations. They check

email at least once a day (72%), own their own computer (85%), download music files (60%), and 26% use instant messenger (IM).

College students also use the Internet for educational purposes. It has become a tool that is required in numerous universities and colleges across the world. Many college students (48%) reported being required to use the Internet as a form of communication with other students in their classes and 58% used email to communicate with an instructor. Fortunately, 79% of college students feel that the Internet has impacted their academic experience positively (Jones & Madden, 2002).

In addition to using the Internet for educational purposes, college students are using the latest communication technology on the Internet such as chatrooms, blogs, YouTube, Instant Messaging (IM), MySpace, and Facebook in order to communicate socially. Forty two percent of college students reported that they use the Internet the most for communicating socially (Jones & Madden, 2002). Web Analytics Association (2006) reported that MySpace, Facebook, and YouTube are the top three favorite websites of college students. This was the first time that a new website (YouTube) had made the top five in its first year. This study clearly indicates that college students are in the forefront of utilizing the most up-to-date Internet technologies.

A large number of college professors have used the Internet and email for a number of years and report using the Internet and email on a daily basis (Jones & Johnson-Yale, 2005). However, when using the Internet to communicate with students, professors “are more likely to use email than newer technologies such as instant messaging, chat, Web boards” (Jones & Madden, 2002, p. 9). Yet when asked about other Internet tools such as chatrooms (37%), email-lists (6%), video or audio conferencing (0%) as a way to communicate with students, a very small percentage of professors reported their use (Jones & Johnson-Yale, 2005).

As educators consider the use of video communication tools such as YouTube, they must strongly consider what students’ think and feel about these tools in their courses. Frey and Birnbaum (2002) found that students considered teachers who used technology in their courses as more organized than those who did not use it.

Because limited research has been conducted in the area of new communication technologies used within the classroom to enhance learning, the purpose of this study was to determine if students’ perceived the use of one technology platform, YouTube, as beneficial to their classroom learning experience.

Methods

Before beginning this study, it was submitted to and approved by the university’s Human Subject Institutional Review Board.

Sample

Participants (n = 837) in this study were undergraduate students enrolled in a general education, required health education course at a southeastern university in Fall, 2007. The sample was a nonrandomized convenience sample.

Instrument Development

The questionnaire was developed based on the researchers’ knowledge of YouTube and a literature review. To further establish face and content validity, three experts in the fields of distance education and health education reviewed the questionnaire. One item was revised and one was added to the prior instrumentation based on the reviewers’ feedback. The questionnaire was not tested for reliability due to time and course constraints. This will be discussed further in the limitations section.

The final questionnaire included five demographic questions and eleven questions related to students' usage of YouTube and their learning environments. Demographic questions asked students' age, gender, class, race/ethnicity, and residence. The next eleven questions were related to the students' usage of YouTube and their perceptions of its use in their courses. Questions were dichotomous (yes, no) and exhaustive (check all that apply).

Procedures

In class, via email, and on BlackBoard™ postings, all students were asked to participate in the optional study. Students were offered extra credit for participating. Students received a web address where they went to complete the confidential questionnaire. During class, via email and in the written instructions that appeared on the online survey instrument, students were informed that: their participation was voluntary and anonymous; they had the right to stop at any time for any reason; that they could elect to skip questions and to select only those to which they chose to respond; and that the decision to participate (or not participate) would not involve penalty of any kind. Upon completion of the questionnaire, students received a receipt that contained a unique time stamp that they were to print out and bring to their instructor as proof they had completed the questionnaire and to receive their extra credit.

Data Analysis

After all data was collected, The Statistical Package for the Social Sciences (SPSS 15.0) was used to analyze the data. Frequency distributions, means, standard deviations, and ranges of scores were computed to describe the results of the study. In addition, to address the research questions of this study, cross-tabulation tables were computed to determine any relationship between variables. Standardized residuals were used to help explain relationships between the independent variable and the dependent variables when the analyses yielded significant statistics. Alpha level of significance was set at the .05 level to reduce the likelihood of committing a Type 1 error.

RESULTS

Demographics

A total of 813 out of 837 sampled completed the survey (97% response rate). Overall, students were using YouTube frequently to watch videos, found it to enhance their learning, and recommended that their professors include it in their courses (Tables 1 & 3). Sixty-six percent ($n = 538$) of the respondents were female and 34% ($n = 275$) male. Age ranged from 17-45 years of age with the majority of respondents being 18 (52%) and 19 (26%) years of age. The majority of the population (61%, $n = 493$) were freshman and 28% ($n = 226$) were sophomores. Seventy-seven percent of respondents ($n = 626$) were Caucasian, 14% African American ($n = 113$), with 3.6% of respondents being Latino or Hispanic ($n = 29$). The majority of respondents live in college dormitories or residence halls ($n = 485$, 60%) with others living in off-campus housing ($n = 292$, 36%) (Table 2).

YouTube usage

Respondents were asked about their YouTube usage, specifically if they had ever searched or watched a YouTube video. Ninety-four percent of respondents ($n = 762$) shared that they had. Chi-square analysis revealed that having ever searched or watched a YouTube video was significantly associated with the students' gender ($\chi^2 = 4.22$) with males more likely to have searched or watched than had females (Table 5). In addition, 79% ($n = 637$) reported ever having received a YouTube link via email to watch which was significantly associated with age (Kendall's tau-c = .052) (Table 4). In terms of frequency of YouTube usage, the majority of

respondents (64%, n = 518) reported watching YouTube videos 0-1 times per week on average (Table 1).

Table 1
YouTube Usage

Characteristic	N	n	%
Had ever searched out and watched a YouTube video	811	762	94.0
Had ever been sent a YouTube link to watch a video	807	637	78.9
How many times per week watching YouTube videos	808		
0-1 times		518	64.1
2-5 times		208	25.7
6-10 times		50	6.2
11 or more times		32	4.0
Had ever created their own YouTube video	809	89	11.0
If yes, created for:	99		
public viewing		83	83.9
private viewing		16	16.2
If yes, created for:	95		
Class assignment		13	13.7
Personal use		81	85.3
Business use		1	1.1
Found the YouTube site easy to use	236		
Yes		221	93.6
No		15	6.4

Kendall's tau-c statistics revealed that gender (Kendall's tau-c = .296), race (Kendall's tau-c = .085), and student class (Kendall's tau-c = .057) were all significantly associated with the number of times per week students watch a YouTube video (Table 4). Females were more likely to watch a video 0 to 1 time per week, whereas males were more likely to watch 2 or more times per week. Freshman students were also less likely to watch 11 or more times per week, whereas juniors were more likely to watch 2 to 5 times and 11 or more times per week compared to sophomores and seniors. Asian/ Pacific Islanders were more likely to watch 2 to 10 times per week and less likely to watch 0 to 1 time per week compared to other races.

Ninety four percent (n = 221) of respondents shared that YouTube was easy to use.

Eleven percent (n = 89) of the students shared that they had created their own YouTube video in the past although the majority had not created their own video (89%, n = 720). Chi-squares revealed that this was significant according to gender ($\chi^2 = 15.01$) and that males were more likely to have created their own video whereas conversely females were less likely to have ever created their own video (Table 5). Of those who did create their own YouTube video, 84% (n = 83)

created it for public viewing (vs. 16% (n = 16) restricted to private viewing only). When asked what the purpose of creating the video was, 14% (n = 13) created it for a class assignment, 85% (n = 81) created the video for personal use or leisure, and 1% (n = 1) created the video for business or professional purposes (Table 1). Kendall's tau-c revealed that having created a video for a class assignment, personal use or leisure, or business or professional purposes was significantly associated with age (Kendall's tau-c = .148) and class (Kendall's tau-c = .123) (Table 4). Interestingly, juniors and those aged 21 were more likely to have created a video for business use than for any other purpose when compared to all other classes and ages.

Table 2
Demographic Characteristics of the Sample

Characteristic	<i>M</i>	<i>SD</i>	<i>N</i>	n	%
Age					
17-19	19.12	2.49	788	624	79.2
20-22				128	16.2
23-45				36	4.6
Gender			813		
Male				275	33.8
Female				538	66.2
Race/ethnicity			810		
White-not Hispanic				626	77.3
Black-not Hispanic				113	14.0
Asian or Pacific Islander				29	3.6
Hispanic or Latino				16	2.0
American Indian or Alaskan Native				4	0.5
Other				22	2.7
Class Standing			811		
Freshman				493	60.8
Sophomore				226	27.9
Junior				66	8.1
Senior				22	2.7
Other				4	0.5
Residence			810		
College dormitory or residence hall				485	59.9
Off-campus house or apartment				292	36.0
Parent/guardian's home				27	3.3
Fraternity or sorority house				6	0.7

YouTube usage in the classroom

Respondents were asked if they had ever seen a YouTube video used as a teaching tool in one of their classes. Forty-seven percent (n = 373) reported that they had while 53% (n = 427) had not. Chi-square statistics revealed that this was significantly associated with gender ($\chi^2 = 10.43$)

(Table 5). Of those who had seen a YouTube video used in a course, the majority (65%, $n = 246$) reported that the video was shown in-class versus only 5.5% ($n = 21$) of learners viewing them in their online courses. Thirty percent ($n = 113$) did view YouTube videos in both in-class and online courses. Of those who had viewed YouTube videos in class, 89% ($n = 336$) felt that the YouTube resource enhanced their learning experience and 73% ($n = 581$) felt that instructors should use YouTube videos to supplement their teaching and content in their courses. Twenty-seven percent ($n = 220$) of students didn't recommend using YouTube in their courses (Table 3).

Table 3
YouTube Usage in the Classroom

Characteristic	N	n	%
Had ever seen YouTube used as a teaching tool	800	373	46.6
If yes, used in :	380		
Online class		21	5.5
Face to face class		246	64.7
Both		113	29.7
Enhanced learning experience and kept engaged in the course content	378		
Yes		336	88.9
No		42	11.1
Recommended that instructors consider using YouTube in their courses	801	581	72.5

Limitations

One limitation of this study was that there may have been some respondent confusion on the intention of the last item: would you recommend that instructors consider using YouTube in their courses? Respondents (27% recommended that YouTube not be used in their courses) may have been unclear on if the item was referring to YouTube viewing, versus creating and uploading a video to YouTube which are two different processes with the later being more difficult.

Another limitation to this study was that the study is only representative of this Southeastern university sample and not generalisable to other areas or universities. While other universities may have a similar demographic and culture as this specific university, more research needs to be conducted to determine if the findings from this study are similar to those from other universities. It should also be noted that because of the small number of items in the instrumentation, results can only be generalized to shared student's perceptions.

Another limitation to consider is that students' perceptions were studied without exploring their increase in learning or performance in the classroom. Future research will need to study students' learning or performance outcomes in the classroom correlated with their perceptions, the type of YouTube video or content, and how often the videos are used in the classroom. Interviews, students' grades, and the type of university might be factors to consider when conducting this research.

Table 4
Frequency Distributions (n), Percentages (%), and Kendall's tau-c Values for Cross-tabulations of YouTube Usage by Gender, Age, Race, - Class Standing

Created for:									
Age:	Class Use		Personal/Leisure Use		Business/Professional Use		Total		
	n	%	n	%	n	%	N		
18	11	21.6	40	78.4	0	0	51		
19	1	4.0	24	96.0	0	0	25		
20	1	10.0	9	90.0	0	0	10		
21	0	0	2	66.7	1	33.3**	3		
22	0	0	3	100	0	0	3		
25	0	0	1	100.0	0	0	1		
Total	13	14.0	79	84.9	1	1.1	93		
Kendall's tau-c = .15**									
Created for:									
Student Classification:	Class Use		Personal/Leisure Use		Business/Professional Use		Total		
	n	%	n	%	n	%	N		
Freshman	11	19.6	45	80.4	0	0	56		
Sophomore	1	3.7	26	96.3	0	0	27		
Junior	1	11.1	7	77.8	1	11.1*	9		
Senior	0	0	2	100	0	0	2		
Other	0	0	0	0	0	0	0		
Total	13	13.8	80	85.1	1	1.1	94		
Kendall's tau-c = .12*									
Times per Week									
Gender:	0-1		2-5		6-10		11+		Total
	n	%	n	%	n	%	n	%	N
Male	121	44.2	98	35.8**	26	9.5**	29	10.6**	274
Female	396	74.4**	109	20.5	24	4.5	3	0.6	532
Total	517	64.1	207	25.7	50	6.2	32	4.0	806
Kendall's tau-c = .30**									
Student Classification:	0-1		2-5		6-10		11+		Total
	n	%	n	%	n	%	n	%	N
Freshman	328	66.8	124	25.3	29	5.9	10	2.0*	491
Sophomore	139	62.3	54	24.2	17	7.6	13	5.8	223
Junior	30	45.5	26	39.4*	4	6.1	6	9.1*	66
Senior	17	77.3	3	13.6	0	0	2	9.1	22
Other	3	75.0	1	25.0	0	0	0	0	4
Total	517	64.1	208	25.8	50	6.2	31	3.8	806

* = p < .05. ** = p < .01.

Table 5
Frequency Distributions (n), Percentages (%), and Chi-square Values for Crosstabulations of YouTube Usage by Gender

	Gender					
<u>Ever Searched or Watched a YouTube Link</u>	<u>Male</u>		<u>Female</u>		<u>Total</u>	
	n	%	n	%	N	%
Yes	264	96.4	496	92.7	760	93.9
No	10	3.6	39	7.3	49	6.1
Total	274		535		809	
Chi square = 4.22*						
	Gender					
<u>Ever Created Own YouTube Video</u>	<u>Male</u>		<u>Female</u>		<u>Total</u>	
	n	%	n	%	N	%
Yes	46	16.8*	42	7.9*	88	10.9
No	227	83.2	492	92.1	719	89.1
Total	273		534		807	
Chi square = 15.01**						
	Gender					
<u>Ever Seen Used as a Teaching Tool</u>	<u>Male</u>		<u>Female</u>		<u>Total</u>	
	n	%	n	%	N	%
Yes	104	38.5	267	50.6	371	46.5
No	166	61.5	261	49.4	427	53.5
Total	270		528		798	
Chi square = 10.43**						

* = $p < .05$. ** = $p < .01$.

Lastly, the sample was a convenience, non-randomized sample which may have impacted the study's validity. Findings from this study cannot be generalized since the majority of participants were 18-19 years of age, which compromising mostly freshmen (78%) is not completely representative of the students at this university, nor young adults in this region, state, or the nation. Additionally, time and course constraints did not allow the establishment of reliability of the instrument. Because this is a required general health course with preset research guidelines, instructors are only permitted to survey this population once per year. This then does not allow the researchers to do a test-retest survey with these courses or any others. This is a limitation that these researchers have considered and are looking at other piloting options for this instrument.

Conclusions

While more research is necessary, this initial study showed that YouTube may be a viable, innovative teaching resource to communicate important course or content information and for practicing with current technologies. Future research might explore the utility of YouTube as a learner tool to create and upload technology based presentations in a variety of settings. Regardless of the Internet-based video resource utilized, educators experienced with using these resources caution that it should not be used as a student “babysitter,” with the instructor assuming a passive role, but should instead take advantage of its interactive nature in the delivery of the video as well as in post-viewing and follow-up activities. The potential power and utility of this new technology, in both in-class and online classrooms is promising, when managed by an involved instructor who is sufficiently skilled in its application.

The results of this study reveal that students are using YouTube at a high rate. They feel that it is easy to use and they are using it for personal but public viewing. Additionally, they feel that YouTube enhances their learning and want professors to use it in their courses.

Recommendations

Based on the conclusions of this study, there are three recommendations that can be made regarding the use of YouTube in the college classroom.

The first recommendation is that college professors should seek out professional development to learn how to use the YouTube technology and incorporate it into their classrooms. Not only does this study support this recommendation because students recommend that professors use it and they feel it enhances their learning but also because only slightly less than half of the students said they had ever seen it used as a teaching tool. Additionally, the National Education Association endorses this recommendation in its position statement on technology and education (NEA, n.d.). By providing and encouraging college professors to seek out professional development on the use of YouTube and how to incorporate it into their classrooms, they will be able to develop course material, lectures, and teaching strategies that are more prepared for the Web 2.0 generation.

The second recommendation derived from this study is for departments or units within the university to support the use of YouTube and other technologies in professors’ classrooms. This support can come in a variety of different ways: include verbal support of incorporating YouTube in courses at faculty meetings, written support through memos or emails sent to all faculty at the beginning of the semester when courses are being developed, and provide opportunities for faculty members to attend technology workshops or conferences where new technologies are learned.

For example, a YouTube library is being developed in which faculty will be trained to use it as a resource in their classrooms. The library will hold a list of YouTube links that are good sources for use in health related courses at the college level. Faculty training will not only teach faculty how to use the YouTube library but how to incorporate YouTube in their classrooms as a way to enhance student learning.

The last recommendation is to incorporate more YouTube videos within college courses. Students who reported seeing YouTube videos in their courses felt that the videos did increase their learning and they suggested that professors use more YouTube videos. Thus, including more YouTube videos directly related to learning within the classroom may have a positive impact on what students learn. Although more research needs to be conducted regarding the type of YouTube videos used, how often the videos are used, and the increase in student performance after seeing the videos, this study implies that using YouTube in the classroom is a positive idea.

Instructors do need to be aware however that there is inappropriate content on YouTube. Therefore precaution must be taken in order to ensure valid, reliable, and appropriate videos are shown in class. It is recommended that all videos be previewed by the instructor before showing them in class.

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Editor's Note: This study provides a basis for definitive exploration of communication, subject matter and logistics involved in faculty-student exchanges.

Faculty and Learner Interaction in Online Courses

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Abstract

Faculty/student interaction in the virtual classroom has been shown to be a key component in successful online instruction. This study examined the relationship between the quantity of instructor responses in an online forum and subsequent student responses. The findings illustrate that the two were positively correlated ($r = .763$, $p < .01$). This correlation is both practically and statistically significant as these findings may provide yet another component for assessing the quality of online education as well as student success, satisfaction and retention rates.

Keywords: distance learning, distance education, interaction, virtual classroom, discourse, instructor responses, online learning, faculty, learners, satisfaction

Introduction

Distance education has been utilized successfully as a teaching/learning methodology for over 30 years. The electronic classroom provides instruction for hundreds of thousands of students worldwide who otherwise would have to travel to traditional classrooms. Today's virtual learning centers allow students and professors to interact 24/7 and students to share ideas and questions through blogs, discussions and forums. These same instructors and students utilize technology to create virtual communities in which to share course notes, examples, assignments and projects, expertise, ideas, and opinions. Instructors and learners also utilize forums in order to post and respond to e-text-based messages.

Discussions forums are the foundation of communication in the virtual classroom but the question remains: is there a correlation between the number of instructor posting and subsequent student response or postings?

The term *interaction* in this study is defined as the e-dialogue between instructors and learners. For interaction to be utilized in the analysis for this study, it had to be originated by either instructor or student and had to contain more than five words.

Purpose

The purpose of this study is to generate new knowledge about faculty/learner interaction in online courses. Specifically, this study was conducted to answer the following research question:

Is there a direct relationship between the extent of faculty interaction and the extent of subsequent learner interaction in discussion forums in online courses?

The answer to this research question may shed further light on the importance of facilitating forums between faculty and learners in the online learning environment. Specifically, the findings of this study may have implications for policy and practice as well as an assessment tool for evaluating the effectiveness of online learning. It is also important to note that the inclusion of forums in online courses and the integration of communication technologies to facilitate these forums may have an effect on student enrollment and retention.

The Research Problem

The institution of higher education is becoming increasingly competitive both globally and within the boundaries of the United States. With minimal, if any, limitations imposed by time and place, the online institution is gaining considerable popularity among those seeking a higher education (Arbaugh, 2000; Deal, 2002; Kearsley, 2002; King & Hildreth, 2001; Mayzer & Dejong, 2003; Picciano, 2001; Schott Karr, 2002; Taylor, 2002). Within this competitive marketplace of higher education, input from graduate learners in education regarding faculty/learner interaction is clearly a factor of great importance to the vitality of the online institution. Research has emphasized that teaching online calls for instructors to take on an intellectual and social role fostering a sense of community among groups of learners in online courses (Kiriakidis, as cited in Palloff & Pratt, 1999; Arbaugh, 2000; Overbaugh, 2002).

Creating a high degree of interactivity between faculty and learners is the most important role of the faculty in online classes (Brown & Kiriakidis, 2007; Kearsley, 2000). Online learners are usually self-motivated and independent adult learners skillful with computers, who demand the opportunity to interact with faculty and co-learners in order to create a community of learning. Enhanced understanding about faculty/learner interaction may assist stakeholders in: (a) hiring competent online faculty; (b) developing a policy on setting clear expectations on posting to forums; (c) designing interactive online courses; d) creating online communities for communication; (e) increasing enrollment; and (f) maintaining retention.

Review of the Literature

Increasing access to education through online instruction provides the opportunity for thousands of adults to achieve educational goals. Although access is key, it is also important to consider the pedagogical impact of the virtual classroom. Research by Kearsley (1998), Knowlton (2006) and others (Haraiseim et al., 1996; Palloff & Pratt, 1999; Salmon, 2000) identified a change of role for the virtual instructor. Moving from classroom administrator to facilitator, necessitates a change in the focus for the faculty member. In the facilitation role, the initiation and advancement of interaction becomes the heart of the learning environment (Masterson, 2006).

Little research is available that directly addresses the correlation between faculty and subsequent learner interaction. One study (Masterson, 2006), conducted with freshmen community college students, clearly linked the frequency of instructor interaction with that of the students. Masterson states that the active presence of an instructor in the discussions heightened the quantity and quality of student responses. Furthermore, this study not only illustrated a positive correlation between faculty and student response rates but also a clear linkage to student perceptions of higher quality learning.

The majority of the literature focused on the correlation between learner persistence in the virtual classroom and interaction. Smith (1997) points out that effective curriculum is hindered by the faculty's lack of understanding of the importance of interaction in the online classroom. This researcher goes on to state that instructors must develop and hone skills to assist student to adjust to the unique characteristics of distance education. The lack of adequate professional development may hinder some professors from fully engaging their students in online interaction (Lowell, 2005). Williams (2006) states that with all the challenges facing distance education, studies show that distance learning students desire content and motivational support beyond course materials and their success is limited when interaction is lacking. According to White (2005), adult learners may be disappointed when they are unable to accomplish the academic tasks required due to lack of faculty response and this frustration could lead to disinterest and eventually withdrawal from courses.

Since the early days of distance learning, researchers have illustrated the need for higher levels of interaction in the teaching and learning process (Vygotsky, 1978). This same researcher stated “collaborative learning is necessary in building one’s own cognitive process”(p.5). Soller (2004) supports this belief by saying that if students do not share their newly acquired knowledge to verify its accuracy, the interactive void results in poor student outcomes. Additionally, Mickelson (2007) reports that distance education possesses more potential and more promise in promoting student/professor interaction and enhancing learning outcomes due to its utilization of technology. For instance Bruce et. Al. (2005), suggest that the World Wide Web has the capacity to promote student/instructor interactions and multiple paths for instruction because students and professors share enhanced control over information access, course pace, and the inquiry process.

Forums and electronic communication technologies offer opportunities for learning and teaching. According to the Observatory on Borderless Higher Education (2004), “While we may not realize it, we have entered the perfect electric storm, where technology, the art of teaching, and the needs of learners are converging” (p. 2). “We are still at the beginning of harnessing their potential” p. 17).

Research conducted with university-level distance students illustrated three top concerns involving the faculty: (a) competency of instruction, (b) communications, and (c) availability (Noel-Levitz, 2006). Yang and Cornelius (2005) and Paloff and Pratt (2007) concur and indicate that learner success in the online classroom may depend most on the competency of faculty to create a sense of community as well as emotional and scholarly connection with learners. Further evidence to support the need to extensive interaction between instructor and student comes from Conole (2004) who states that online communities allow for social and collegial interaction between faculty and learners. Telecommunications learners benefit from a heightened sense of academic community resulting from being able to connect with peers (Overbaugh, 2002).

In summary, the literature has shown that instructor/learner interaction is essential in the virtual classroom as it offers rich and diverse information and gives learners a sense of belonging and connectedness to their online courses. Expanding interaction may provide opportunities for online learners to communicate and refine knowledge through (a) a deeper analysis of the course; (c) fostering a sense of community; (c) facilitating forums for in-depth dialogue; and (d) assisting learners in mastering the curriculum. The success of online courses may depend on the amount of interaction that supports the social and academic needs of online learners and improvement in online learning and critical thinking skills.

Conceptual Framework

This study extended the research of others (e.g., Chou, 2001; Deal, 2002, Overbaugh, 2002; Worley & Chesebro, 2002; Masterson, 2006) and was founded on the assumption that there is a positive correlation between the extent of faculty interaction and the extent of subsequent learner interaction in forums of online courses. Masterson (2006) states that the active presence of an instructor in the discussions heightens the quantity and quality of student responses.

Research Methodology

This study’s path analysis model was grounded on the theoretical and empirical research literature reviewed. A specific quantitative path analysis model was developed in order to test and analyze the direct hypothesized relationship between the extent of faculty interaction and the extent of subsequent learner interaction. Everitt & Dunn (1991) describe the analysis as a:

... broadening of the regression model, used to test the robustness of the correlation matrix against two or more causal models which are being compared in the study. A regression is done for each variable in the model as a dependent on others which the model indicates are causes. The regression weights predicted by the model are compared

with the observed correlation matrix for the variables, and a goodness-of-fit statistic is calculated. The best-fitting of two or more models is selected by the researcher as the best model for advancement of theory (p57).

Research Design

The researcher used quantitative path analysis and content analysis to conduct this study. Quantitative path analysis procedures were used to examine the direct hypothesized relationship between the extent of faculty interaction and the extent of learner interaction. Content analysis procedures were used on the computer-mediated transcripts of forums between faculty and learners within several graduate courses in education offered entirely online by an accredited institution of higher education.

Content Analysis

The primary data source for this study was the computer-mediated transcripts generated by online faculty and learners as they participated in forums of their respective online courses. With the inherent capacity to archive interaction, computer-mediated transcripts provided an ideal means to identify and analyze the extent of interaction exchanged among the participants in each of the online courses involved in this study. Content analysis procedures were used to analyze postings entered by faculty and learners in order to quantify interaction (i.e., the extent of both faculty and learner interaction).

Participants and Setting

The setting consisted of an online institution of higher education offering graduate level education degree programs entirely online. The participating institution is: (a) regionally accredited; (b) there are no residency requirements; (c) all communications and interactions between learners and instructors take place online using email and forums using the institution's computer server; (d) faculty are not required to participate in asynchronous discussion forums; and (e) learners are required to participate in asynchronous discussion forums in order to receive a grade for each forums. Asynchronous discussions are text-based, mandatory, and contribute between 5% and 25% of each learner's final grade. A learner meets the course requirements on postings even with one complete posting to each question posted by the instructor in each lesson or module of online courses. Only interactions of five words or more, posted by either faculty or student, were considered in this research.

Data Collection

The researcher collected the aforementioned data from the online databases of the participating online institution of higher education. Specifically, the online databases contained copies of the discussions between faculty and learners. The collected data were saved into a text file which was edited to ensure learner and instructor anonymity. The edited data were saved into one database file in order to perform content analysis.

Data Analysis

In this study's quantitative path analysis model, both faculty and instructor interaction were continuous variables. Descriptive statistics were performed in order to compute the learner n size and the extent of learner interaction (number of learner postings), and the faculty n size and the extent of faculty interaction (number of instructor postings). Descriptive statistics were also performed to compute the mean and standard deviation of the number of learner postings and the number of faculty postings.

A path coefficient may report the relative strengths or weaknesses of the extent of instructor interaction on the extent of learner interaction. Path coefficients for the relationship between learner postings and faculty postings with $\alpha = .05$ and $p < .05$ for statistical significance were

calculated. The extent of faculty interaction was the independent variable and the extent of learner interaction was the dependent variable.

Research Results

Based on the content analysis, there were 14 faculty and 249 learners. The content analysis revealed 169 instructor postings and 1,014 learner postings. With these numbers, this study's sample size was $n = 263$ participants and the total number of postings posted by both faculty and learners was 1,183.

Table 1 presents the descriptive data for faculty and learner interaction. It includes the mean level and corresponding SD. The number of learner postings represents the extent of asynchronous learner interaction. The number of faculty e-postings represents the extent of asynchronous faculty interaction.

Table 1
Descriptive Data for Instructor and Learner Interaction

	n Size	Number of Postings	M(SD)
Learners	249	1,014	72.43 (32.517)
Instructors	14	169	12.07 (9.042)
Total	263	1,183	16.04788 (5.00)

The relationship between the number of faculty postings and the number of learner postings was found to be of statistical significance. The Pearson Correlation value for the relationship between the extent of learner interaction and the extent of faculty interaction was found to be $r = .763(**)$ where $* = p < .05$; $** = p < .01$ level (2-tailed). The correlation coefficient was positive and statistically significant. Correlation coefficients of determination indicated that this relationship was of practical significance (the variance in the extent of learner postings was associated with the extent of faculty postings). The R square change was .582 with $F = 16.695$ significant at $p = .002$. Thus, the data analysis indicated that this direct relationship was both of statistical and practical significance.

The relationship between the extent of faculty interaction and the extent of learner interaction in online courses was found to be of statistical significance ($r = .763, p < .01$). The direct effect of the extent of faculty interaction on the extent of learner interaction measured the same relationship as the correlation between these two variables (faculty interaction and learner interaction). The path coefficient for this path segment was identical to the correlation coefficient for these two variables ($\beta = .763, p < .01$).

Interpretations and Implications for Policy and Practice

The findings of this study suggest that there is a direct relationship between the extent of faculty involvement in online discussions and subsequent learner interaction. These findings suggest that learners participate in forums to a greater degree when instructors are actively involved. This supports the findings of Matheson (2006).

Faculty/learner interaction has been shown to be a key factor in the success of students in the virtual classroom as students improve their levels of knowledge, critical thinking, and understanding while communicating electronically with faculty and co-learners (Conole, 2004).

This key factor can not be overlooked by online administrators who are tasked with assessment of quality online programs and retention of students. Policy makers, administrators, and faculty may wish to use the findings of this study to develop policy on interaction within forums in order to improve communication in online courses.

Questions still remain unanswered concerning whether or not the findings of this study would vary as a function of a policy on the extent of instructor/learner interaction in forums of the online higher education institution regarding: (a) academic level of online courses; (b) the multiple roles of the faculty teaching undergraduate and/or graduate online courses; and (c) the academic specialization (e.g., business, education, psychology). Scholars may wish to examine the effect of the extent of faculty interaction on the extent of learner interaction should interaction be synchronous and/or multimedia-based.

Limitations of the Study

In conjunction with this research study's assumptions, there are some limitations to this study that may limit its generalization to other research settings. The findings of this study may not be generalized to the entire spectrum of online learners. The results may be indicative of only the responding sample and boundaries of this population of online learners. The constructs of this study were analyzed at a given point in time while dynamic technological changes can occur in the online learning environment. This research study did not develop an instrument for evaluating a policy on MLD in forums or for measuring learner satisfaction or success with the asynchronous online learning systems.

Conclusion

The findings of this study suggest that there is a direct relationship between faculty and learner interaction in online courses. This relationship was of practical and statistical significance. Faculty/learner interaction is a factor of great importance to administrators who recognize the need for creating effective learning online communities. Stakeholders of online institutions must also develop and deliver training to faculty to assure heightened levels of communication in the virtual classroom. These findings contribute to a better understanding of faculty/learner interaction that may lead to learner success, satisfaction, and retention.

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Editor's Note: Practitioners and researchers are focusing on blended learning because of increasing use of Learning Management Systems (LMS) in schools. Individual teachers and professors are finding the LMS invaluable and easy to use for blended (hybrid) instruction within the classroom .

Hybrid Learning and the Principles of Good Practice in Undergraduate Education

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Abstract

The use of technology for teaching and learning has been changing the delivery of education. Among these changes is the increasing use of a blended approach to teaching and learning. This paper reports the findings of a study that investigated students' perceptions of hybrid or blended learning in a private university in southeastern United States. The students' experiences will be considered in accordance with the principles for good practice in undergraduate education posited by Chickering and Gamson (1987). The paper will also explore the differences between gender and overall student satisfaction with blended learning.

Keywords: blended learning, hybrid instructions, good practice; student satisfaction, teaching and learning, technology, undergraduate instructions.

Introduction

The pervasive use of various information technologies throughout the society is impacting the teaching and learning environment. Increasingly, these technologies are being integrated in the teaching and learning process. Educators are demanding a more blended and flexible approach to teaching and the marketplace is moving toward providing hybrid solutions in which the Internet is combined with a variety of other options for the delivery of good instruction (Barker Tulloch, 2000). Over the years, such terms as blended learning, hybrid learning, distributed, and flexible learning have been used to refer to this approach to teaching and learning that has seen a resurgence in recent times (Duhaney, 2004; Marsh, 2001; Smith, 2001). The terms hybrid learning and blended learning will be used synonymously throughout this paper.

During the 1990s the emergence of the World Wide Web (WWW) and the increasing use of the Internet precipitated the use of hybrid instruction and learning activities, particularly within the corporate sector. The prevailing belief at that time was that training and development activities could benefit from electronic learning (e-learning). With that format, resources and instruction were provided purely online. However, as Wilson and Smilanich (2005) observed, mixed successes combined with continued workplace changes have led many organizations back to using the classroom as the backbone of their training programs. Within the field of education, there is growing use of blended learning strategies (Kriger, 2003; Villanti, 2003; American Federation of Teachers, 2000). Ward and LaBranche (2003) noted that blended learning first gained acceptance on college and university campuses, where Web-delivered readings, resources, and student discussions increasingly augmented classroom instruction. This was facilitated with the use of course management software such as Angel, BlackBoard, E-College, Moodle and WebCT.

In light of the widespread use of blended learning approaches in college and university classrooms, this paper reports the results of a study that investigated students' perceptions of hybrid learning. The students' experiences are discussed within the context of the principles for good practice in undergraduate education posited by Chickering and Gamson (1987). The paper also explores the differences between gender and overall student satisfaction with blended

learning. Specific questions, which were raised concerning the students' perceptions of hybrid learning, are:

1. How effective is the delivery of hybrid courses, considering student/faculty contacts, cooperation among students, encouragement of active learning, prompt feedback, communication of high expectations, and respect for diverse ways of learning?
2. Is there a relationship between age and students' satisfaction with hybrid courses?
3. Is there an association between gender and students' satisfaction with hybrid courses?

Defining Hybrid or Blended Learning

Hybrid learning is described as the use of electronic-learning tools (software, Internet resources - such as e-mail, World Wide Web including video and/or audio streaming, television, voice-mail, conference call) and traditional face-to-face classroom teaching to ensure maximum effectiveness (Marsh, 2001; Kriger, 2003; Smith 2001). Chamberlin (2001) defines hybrid learning as a combination of online teaching and face-to-face delivery. Garnham and Kaleta (2002) describe the hybrid course as a teaching/learning situation where a good portion of learning activities have been moved to the online platform, but the time spent in a traditional classroom has not been eliminated.

Others perceive blended learning in broader contexts (Singh, 2003 & Driscoll, 2002). Driscoll (2002) sees blended learning as four different concepts: (a) the combination of modes of web-based technology; (b) the combination of various pedagogical approaches; (c) the combination of any instructional technology with face-to-face instruction; and (d) the mixture of instructional technology with actual job tasks. Similarly, Singh (2003) views blended learning as a combination of different learning strategies or what he refers to as 'dimensions,' although many of the dimensions have over-lapping attributes.

From the foregoing, any teaching and learning situation which incorporates the traditional face-to-face approach with the use of the synchronous and/or asynchronous format and the utilization of different pedagogical approaches, is a hybrid learning environment. With this model, both the instructor and the use of technology are important for the effective delivery of instruction. In this environment the students must play a pivotal role in the instruction and learning process for it to be effective.

A Brief Review of the Research

Many of the studies on the integration of technology in teaching and learning, particularly distance education, are considered anecdotal. Simonson, Smaldino, Albright, and Zvacek (2003) observe that the largely anecdotal nature of the distance education literature makes it difficult to generalize the findings of studies. Consequently, statements regarding effectiveness and satisfaction of technology in teaching and learning are often based on what individuals in the area intuit rather than on empirical results.

In their research on blended learning, Rogers, Graham, Rasmussen, Campbell, and Ure (2003) concluded that instructors and learners value 2-way communication in the blending of face-to-face and distance learners in a synchronous classroom. They also found that it was beneficial to find ways to increase the spontaneity of social interactions in the synchronous class setting and to utilize different asynchronous communication methods to supplement when students are not communicating during class. In their study, Burgon and Williams (2003) observed that social interaction enhance learning by giving course participants a place to voice questions, share comments, and build community. This was also borne out in a study by Brannan (2002) in which a comparison of face-to-face, hybrid, and true online instruction was conducted. This study found

that technology increased the interactions for the four categories studied: student-instructor, student-student, student-content, and student-technology.

King and Fricker (2002) found that the use of a multimodal delivery method, such as that which is seen in the hybrid learning setting, was satisfying, and students suggested delivery designs that embraced a mix of teaching delivery strategies (e.g., a mixture of online and face-to-face approaches). They reported the least preference for the use of only one delivery method. It has also been found that students' interaction and satisfaction improve when e-learning options were added to traditional forms of learning (Kaur & Ahmed, 2006; DeLacey & Leonard, 2002).

In a study conducted in collaboration with some leading corporations and academic institutions, Thomson's e-learning company NETg found that a structured curriculum of blended learning generated a 30 % increase in accuracy of performance and a 41 % increase in speed of performance over single-delivery. The Thomson Job Impact study, also found that a blended learning approach has the power to increase employee productivity significantly (Barbian, 2002; The Next Generation of Corporate Learning, 2003).

Principles of Undergraduate Education

While the effectiveness of new delivery modes like hybrid learning has not yet been definitively determined, there are some guiding principles by which the effectiveness may be ascertained. Newlin and Wang (2002) believe that the application of the principles of good practice in undergraduate education posited by Chickering and Gamson (1987) can guide the design and implementation of web-based courses. The authors believe that this can be extended to the variety of hybrid courses. The seven principles for good undergraduate education as outlined by Chickering and Gamson (1987) are: (a) encouraging student/faculty contact; (b) encouraging cooperation among students; (c) encouraging active learning; (d) giving prompt feedback; (e) emphasizing time on tasks; (f) communicating high expectations; and (g) respecting diverse talents and ways of learning. These principles, which surfaced in the 1980s, might be considered a good starting point from which to appraise the effectiveness of hybrid learning as a mode of instructional delivery in the 21st century classroom.

Subsequent to the publication of the "Seven Principles of Good Practice in Undergraduate Education" (Chickering & Gamson, 1987), there has been an increase in the use of information technologies for teaching and learning (Chickering & Ehrmann, 1996). Chickering and Ehrmann (1996) have presented a number of cost-effective and appropriate ways to use computers, video, and telecommunications technologies to advance the seven principles. Newlin and Wang (2002) also believe that it is necessary to employ these principles, as the pedagogical research on web-based learning and instruction has not kept pace with the proliferation of web-based courses now offered by colleges and universities.

Method

Participants and Setting

The sample for this study included students in the Business Department at a private university in the southeastern United States who took at least one or more hybrid courses. At the time of the survey the business department had an enrollment of 1000 students. The respondents were 150 or 15% of the business students who had taken at least one or more hybrid courses prior to the administration of the survey.

For the purpose of this study, courses considered hybrid were those that utilized face-to-face and online components in the delivery of instruction as the courses at this institution. The classes met for eight weeks and there was full attendance for the duration of the course. In addition to face-to-face classroom instruction, assignments were given online (i.e., threaded discussions, quizzes and

submission of class assignments). Proportionally, 60% of the classroom instruction was face-to-face and 40% online. The courses were organized in such a way that actual teaching and coverage of the class objectives were done in both the face-to-face and online formats. Relevant discussions were conducted on-line and students were given some online quizzes and research based assignments that were to be completed using the online platform. Teachers graded and returned class assignments online and utilized the platform to address students' questions and concerns.

Instrumentation

A short questionnaire was developed to capture students' perception of the hybrid approach used in their course(s). Educators who were intimately involved in the delivery of courses using hybrid methodology reviewed the questionnaire for content validity. All five reviewers held PhDs or EdDs and taught one or more courses using the blended approach. Based on suggestions from the reviewers, some questions were deleted because of redundancy or rephrased to eliminate ambiguity.

The instrument consisted of 18 statements that were placed in the following categories: student/faculty contact, active learning, prompt feedback, communicates high expectations, respect for diverse talents and ways of learning, encourages cooperation among students, and a miscellaneous category of overall satisfaction of the hybrid methodology. A 5-point Likert-type scale with the possible responses ranging from 5 (very satisfied) to 1 (not satisfied) was used.

Procedure

The questionnaires were distributed to the subjects during the final session of their summer and fall 2004 hybrid courses. They were offered the option to complete them in or outside the classroom. All 150 subjects returned the questionnaires. However, only 111 or 75% were deemed usable. The remaining 39 questionnaires were excluded because respondents did not answer all the questions. For example, some subjects only responded to the demographic questions. The researchers felt that inclusion of these questions would skew the results. Data were coded and entered directly in SPSS 12.0 for Windows for analysis. The results were analyzed at the .05 alpha level.

Results and Discussion

As stated earlier, 150 questionnaires were returned and 111 were usable. Seventy-two respondents were females (65 %) and 39 males (35 %). Table 1 shows the distribution of respondents by gender and age. The highest percentage of students (36%) taking hybrid courses was in the 18-24 age group. Those 29 and under accounted for 49 % of course takers. Fifty-one percent of the respondents were in the 30 to over 45 age range. The number of hybrid courses taken ranged from one to 15.

Table 1
Gender and Age Distribution of Respondents in Hybrid Courses

Gender	Number	Percent	Age	Number/Percent
Male	39	(35%)	18-24	36 (32%)
Female	72	(65%)	25-29	19 (17%)
			30-34	24 (22%)
			35-39	17 (15%)
			40-44	10 (9%)
			45 and over	5 (5%)

How effective is the delivery of hybrid courses, considering student faculty contacts, cooperation among students, encouragement of active learning, prompt feedback, communications of high expectations, and respect for diverse ways of learning? (Chickering & Gamson, 1987)

As shown in Table 2, respondents were satisfied with the level of faculty contact, active learning, prompt feedback and the communication of high expectations in their hybrid courses. Prompt feedback received the highest overall mean score ($M=3.91$, $SD=1.03$, $N=111$). The lowest satisfaction score was in the area of respect for diverse talents and ways of learning ($M=3.07$, $SD=1.07$, $N=111$). Respondents were neutral in their views on overall satisfaction ($M=3.13$, $SD=1.40$, $N=111$). However the standard deviation was much higher, perhaps indicating a measure of disparity with how the respondents felt concerning their overall satisfaction with hybrid Instruction.

Table 2
Cluster Means and Standard Deviation

Clusters	Means	St. Dev.
1. Student faculty contact	3.83	.91
2. Active learning	3.63	1.17
3. Prompt feedback	3.91	1.03
4. Communicates high expectations	3.81	1.03
5. Respect for diverse talents and ways of learning.	3.07	1.07
6. Student –student contact	3.57	1.07
7. Overall Satisfaction	3.13	1.40

N=111.

Is there a relationship between age and students' satisfaction with hybrid courses?

An independent sample *t* test was applied to find out if age was a factor in determining satisfaction. Student-faculty contact and active learning in a hybrid environment tested significant. Respondents in the under 30-group felt that student-faculty contact was a factor to them ($t=2.21$, $df=110$, $p<.05$). Those under 30 also felt that active learning in a hybrid environment was more of a factor to them than their over 30 counterparts ($t=2.66$, $df=110$, $p<.05$) (see Table 3).

Table 3

Means and Standard Deviations of Respondents Over and Under 25 years (Effectiveness Course Structure) (N =111, >= 30 = 55; < 30 = 56)

Cluster	Age	N	Mean	Std. Dev.	<i>t</i>	<i>p</i>
1. Student Faculty Contact	>30	55	4.02	.79	2.21	.029*
	<30	56	3.64	.99		
2. Active Learning	>30	55	3.91	1.06	2.66	.009*
	<30	56	3.34	1.21		
3. Prompt Feedback	>30	55	4.05	1.06	1.47	.144
	<30	56	3.77	1.09		
4. Communicates High Expectations	>30	55	3.95	.96	1.42	.160
	<30	56	3.67	1.09		
5. Respect Diverse Talents and Ways of Learning	>30	55	3.20	1.03	1.274	.205
	<30	56	2.94	1.11		
6. Encourage Cooperation Among Students	>30	55	3.74	.91	1.73	.086
	<30	56	3.64	.99		
Overall Cluster	>30	55	3.25	1.37	.943	.348
	<30	56	3.00	1.44		

* $p<.05$, df , 110, ^a Degrees of freedom reduced because equal variances not assumed using Levene's test of equality for variances.

Is there a relationship between gender and students' satisfaction with hybrid courses?

Comparison of male and female respondents regarding their perceptions of blended instruction indicated that student-faculty contact, active learning, and the encouragement of cooperation among students were significant. Female respondents were more likely to consider these areas important to their satisfaction than their male counterparts (See table 4). They also were more likely to be concerned about student contact ($t=-2.36$, $df=109$, $p<.05$), active learning ($t=-2.29$, $df=109$, $p<.05$), and encouragement of participation ($t=-2.41$, $df=109$, $p<.05$) than their male counterparts in a blended learning environment. Although the overall cluster means showed that female respondents' perceptions were more positive than their male counterparts, the overall cluster means were not significant.

Table 4**Cluster Means, Standard Deviations, t and p values for Male and Female Respondents.**

(N: Female=72, Male =39)

Cluster	Gender	Mean	Std. Dev.	<i>t</i>	<i>p</i>
1. Student Faculty Contact	Male	3.70	0.97	-2.36	.020*
	Female	4.09	0.77		
2. Active Learning	Male	3.44	1.18	-2.29	.025*
	Female	3.96	1.08		
3. Prompt Feedback	Male	3.86	1.02	-.551	.583
	Female	3.97	1.06		
4. Communicates High Expectations	Male	3.73	1.00	-1.00	.320
	Female	3.93	1.07		
5. Respect Diverse Talents and Ways of Learning	Male	2.96	1.08	-1.44	.153
	Female	3.26	1.04		
6. Encourage Cooperation Among Students	Male	3.38	1.14	-2.41	.018*
	Female	3.88	.86		
Overall Cluster	Male	2.96	1.39	-1.63	.106
	Female	3.41	1.41		

* $p < .05$, $df, 109$, ^a Degrees of freedom reduced because equal variances not assumed using Levene's test of equality for variances.

Although the study did not produce evidence of extreme satisfaction based on the variables highlighted, the results suggest that several areas tested significant and would be worth further investigation.

Recommendations and Conclusion

As the use of information technology becomes more popular, teachers are using these media to supplement their regular face-to-face classroom instruction. Students are able to attend class and use online tools to complete a variety of assignments (e.g., submit papers, participate in discussions and conduct research) in order to achieve course objectives. With the increasing use of hybrid or blended learning practices, more attention must be given to this instructional delivery model, particularly as it relates to the principles for good practices in undergraduate education (Chickering & Gamson, 1987). While some students are fascinated with this instructional delivery model, others are still reluctant to try it. This study was limited to one group of students in a private university. Consequently, in order to generalize and give more authenticity to the results, it would be necessary for a study utilizing more subjects to be carried out over a longer period. Future studies should also be done on a wider scale and involve subjects, using control and experimental groups, from a variety of disciplines in public, private, as well as for-profit universities.

The following conclusions can be drawn from the findings of this study:

1. Students in hybrid courses, at the participating private college in the United States, were satisfied with the delivery of courses with respect to active learning, prompt feedback, encouragement of cooperation among students, and communication of highest expectations, using the hybrid approach.
2. Although the students expressed satisfaction with the hybrid courses on the variables identified previously, their overall satisfaction score (2.78%) was not significant.
3. Students under 35 seemed to be more concerned with student contact than were their over 35 counterparts.

As hybrid or blended learning continues to grow in usage, these findings as well as those which will result from subsequent studies will be crucial in determining the effectiveness of this model in the teaching and learning environment.

Recommendations for Future Research

The increasing number of schools that are using Learning Management Systems (LMS) to augment their face-to-face delivery warrants a more extensive research on hybrid learning. Consequently, we recommend further research in the following areas:

1. A large scale study should be conducted to examine student satisfaction with hybrid instruction.
2. Empirical research relating to the effectiveness of the hybrid modality in comparison with pure distance and face-to-face delivery methods should be conducted.
3. Qualitative research should be carried out with instructors who use the hybrid learning to determine their satisfaction with this instructional approach.
4. Faculty perceptions concerning the use of LMS systems to foster optimal learning should be investigated

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Editor's Note: One of the most satisfying results of a study of this nature is that it focuses on an unavoidable win-win set of circumstances. Barring incredible unforeseen circumstances, increase in student competency in Information and Communication Technology will increase exponentially. It behooves those of us in ICT to set the ground rules and provide substantial support to build students' expertise.

An Analysis of Australian Students' Use of Information and Communication Technology (ICT)

Ardi Marwan
Indonesia

Abstract

This paper presents the analysis of Australian students' use of Information and Communication Technology (ICT). It described their ability in using a wide range of computer applications. Secondary data (PISA data) was used in this study where there were 12, 551 students from 321 schools across Australia involved in the survey. The data was descriptively analyzed using SPSS software to identify and compare students' ICT use and ability. The findings revealed that the majority of students were competent in using ICT both for the context of their school learning and individual use. It was also evident in the data that most students used this technology on a frequent basis.

Keywords: Information and Communication Technology, ICT, competence, degree of use, frequency of use, integration

Introduction

The integration of ICT (Information and Communication Technology) into teaching and learning has become a trend nowadays. This is marked by the exclusive inclusion of this technology into educational activities run by the schools across the world. Australia is one of the countries which has seen the importance of ICT for education. A large amount of funding has been invested to support schools carrying out the ICT integration program.

The idea for investing funding for technology equipment and facilities is well supported by many ICT specialists (e.g., Achacoso, 2003; Jared Keengwe & Anyanwu, 2007). But, it is argued that such investment only is not sufficient. As Keengwe (2007) suggests, the investment in ICT should be followed by continuous evaluation in terms of how such technology is used: technology is important, but what is more important is how it can be used to enhance the quality of teaching and learning.

A number of studies have been conducted to investigate and evaluate the use of ICT in education (see, for example, Jeong, 2001; J Keengwe, 2007; Li, 2007; McMahon, Gradner, Gray, & Mulhern, 1999), but many of these studies were conducted within small scopes (i.e., conducted at one or a few institutions only). There is not much information in regard to the investigation of ICT use conducted at the national and/or international scope.

This study reviews the findings of a study which observed the use of ICT by students from a number of schools across Australia. It also seeks to provide information and recommendations for other countries (particularly developing countries) as to how ICT is used in a developed nation.

Differences in Students' Use of ICT

Some researchers have suggested that the factors such as gender and degree of exposure to ICT have influences on the ways that students use ICT (Looker & Thiessen, 2003; Reddick, Boucher, & Groseilliers, 2000; Rideout, 2000). Looker and Thiessen (2002), for example, in their study

looking at gender differences and computer use among school students in Canada, have found that, generally, male students used computers more frequently than female students. Yet again, they were also more competent in using various computer applications than their female counterparts (see, for example, Bimber, 2000; Pritchard, 1998). However, Looker and Thiessen further argue that the findings suggested that there was no significant difference between these two groups of students. Reddick et. Al. (2000) also noted differences in computer use between “heavy users” and “light users” (p.18). According to them, students who are exposed to computers more often tend to be more competent in their computer use than those who rarely engaged with computers.

Key Research Questions

1. What is the students’ self-reported frequency of ICT use?
2. Are there any differences in frequency of computer use between male and female students and also between less experienced and more experienced students?
3. What types of computer applications are students able to use?
4. Are there any differences in computer ability between male and female students and also between less experienced and more experienced students?

Methods

The Source of Data

The data were taken from PISA (Programme for International Student Assessment) datasets that were collected in 2003. PISA put its emphasis on gathering information about students’ performance in four main areas: reading, mathematics, science and problem solving. These areas were selected because they were considered most essential for students to prepare themselves “to meet the real-life challenges” (OECD, 2005, p.12). However, starting from 2000, PISA also collected information about students’ performance in ICT, the area that is elaborated in the present research.

The data were collected from more than two hundred and fifty thousand students aged 15 years of age spread across 41 countries. All the PISA datasets can be accessed online (www.pisa.oecd.org). The current research used one of the PISA datasets, that is, the data related to students’ ICT performance and Australia was selected as its country of focus. The literature has suggested that there have not been many researches conducted in Australia to examine students’ ICT performance within the nationwide context, with the exception of the work of Moyle (2006) who investigated ICT computer integration program in a number of schools in Australia.

In addition to collecting data about students’ ICT performance, PISA also gathered information about students’ backgrounds such as personal and family background (e.g., sex, age, social, economic background, etc), school background (e.g., private or public), learning background (e.g., motivation) and so forth. Due to its limitation, the current study only selected two background information or variables (sex and number of years engaged with computer) for the purpose of data analysis.

There were 321 schools and 12, 551 students participating in the PISA study in 2003. All of them were randomly selected from all states in Australia (New South Wales: 74 schools and 2982 students; Victoria: 62 schools and 2354 students; Queensland: 48 schools and 1934 students; South Australia: 34 schools and 1234 students; Western Australia: 42 schools and 1767 students; Tasmania: 20 schools and 804 students; Northern Territory: 16 schools and 583 students; Australian Capital Territory: 25 schools and 893 students). The present study aimed to examine the Australian students’ ICT use by using the PISA data collected in 2003.

Analysis of Data

The measure of central tendency was analyzed using descriptive statistics by computing the mean scores of students' responses. A mean score is an average score that can be used to describe the trend in a sample or population (Dancey & Reidy, 2004; Pallant, 2007). It is, however, often misused in practice (Pallant, 2007). For example, people use mean score to calculate the mean of categorical variables (e.g., the number of males and females and marital status). One way of knowing the descriptive information about these variables (instead of calculating the mean), according to Pallant, is by identifying their frequencies (e.g., through frequency command in the SPSS).

Standard Deviation (SD) was also considered in this research to see the average distance of individual observations from the group mean (Harris, 1998). "The SD is a measure of how much the scores in the sample vary around the mean" (Dancey & Reidy, 2004, p.72). If individual observations vary greatly from the group mean, the standard deviation is large, and vice versa. , Dance and Reidy further add that the Standard Deviation can be very useful for further or in depth data analysis. In this research context, SD is used only to give an idea of the variability of individual scores.

Results

Research Question 1 and 2

The findings revealed that the majority of students use ICT from once a week or a month to a few times a week ($M = 2.91$, $SD = 0.76$). The activities that students usually do a few times a week are "looking up the internet" ($M = 2.09$, $SD = 0.91$); "word processing" ($M = 2.20$, $SD = 0.92$); and "using e-mail or chat rooms" ($M = 2.21$, $SD = 1.29$). Meanwhile, examples of activities conducted once a week or a month are "playing games" ($M = 2.70$, $SD = 1.29$); "internet for group collaboration" ($M = 2.94$, $SD = 1.32$); "downloading software from internet" ($M = 2.96$, $SD = 1.34$); and "drawing, painting or graphics programs on a computer" ($M = 3.16$, $SD = 1.25$). Among the least frequently practiced activities (less than once a month) are "using educational software" ($M = 4.04$, $SD = 1.09$) and "computer programming" ($M = 3.57$, $SD = 1.35$). Table 1 provides the details of students' frequency of computer use.

The study also observed the differences in the frequency of computer use between male ($N = 6335$) and female students ($N = 6216$) and between the least experienced students (i.e., less than a year engaged with computers) and the most experienced students (i.e., more than five years). The findings, as shown in Figure 1, suggest that there is a difference of frequency of computer use between male and female students where the male students use computers more often ($M = 2.76$) than their female counterparts ($M = 3.06$).

Table 1
Students' Frequency of ICT Use

Item No	ICT Frequency of Use	Valid Percent ¹					Mean (1-5)	SD
		1	2	3	4	5		
1	The internet to look up information about people, things, or ideas.	26.1	47.9	19.0	4.9	2.1	2.09	0.91
2	Games on a computer	19.7	31.0	21.4	15.3	12.6	2.70	1.29
3	Word processing (e.g., MS Word or Word Perfect)	20.1	51.0	21.1	4.8	3.0	2.20	0.92
4	The internet to collaborate with a group or team	16.7	26.6	22.8	13.7	20.1	2.94	1.32
5	Spreadsheet (e.g., Lotus or Excel)	4.7	18.1	31.7	26.4	19.2	3.37	1.12
6	The internet to download software (including games)	20.0	26.3	20.0	15.3	18.5	2.86	1.34
7	Drawing, painting or graphics programs on a computer	10.2	22.6	26.4	22.8	18.1	3.16	1.25
8	Educational software such as mathematics programs	2.4	8.5	17.5	25.6	46.1	4.04	1.09
9	The computer to help you learn school material	7.8	25.6	25.3	19.8	21.6	3.22	1.26
10	The internet to download music	28.9	28.6	15.1	9.7	17.7	2.59	1.44
11	The computer for programming	9.2	15.5	20.0	19.7	35.6	3.57	1.35
12	A computer for electronic communication (e.g., email or chat rooms)	37.7	31.4	13.4	7.6	10.0	2.21	1.29
	Mean of frequency of use						2.91	0.76

¹ **Response Scale:** 1= almost everyday, 2 = a few times each week, 3 = between once a week and once a month, 4= less than once a month, and 5 = never.

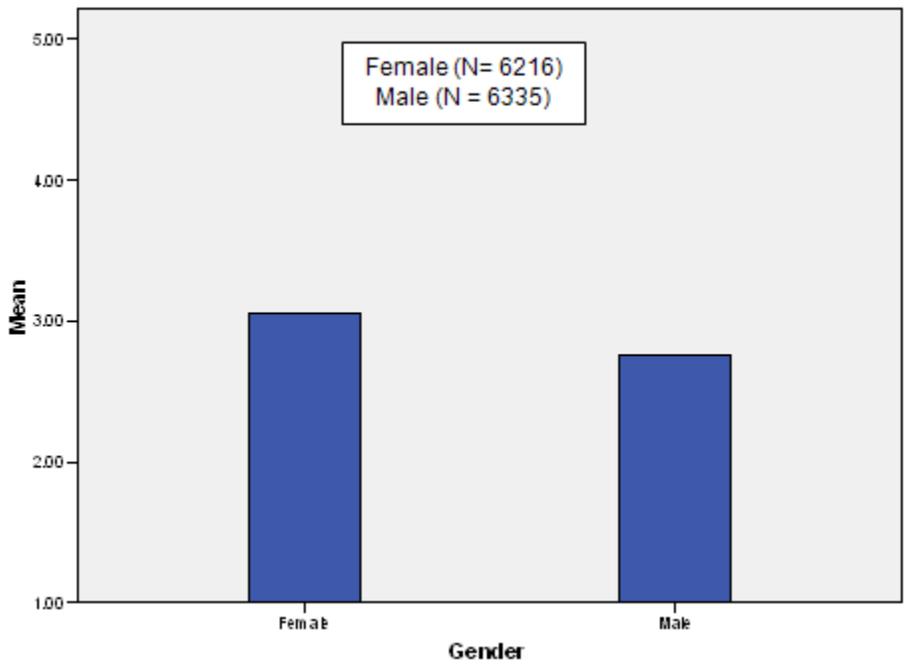


Figure 1: Frequency of computer use and gender differences

The findings, as indicated in figure 2, also revealed that students who have more years engaged with computers tend to use the tools more often than those of shorter years. Their mean scores are 2.84 (more than 5 years), 3.02 (3 to 5 years), 3.15 (1 to 3 years) and 3.34 (less than 1 year) respectively.

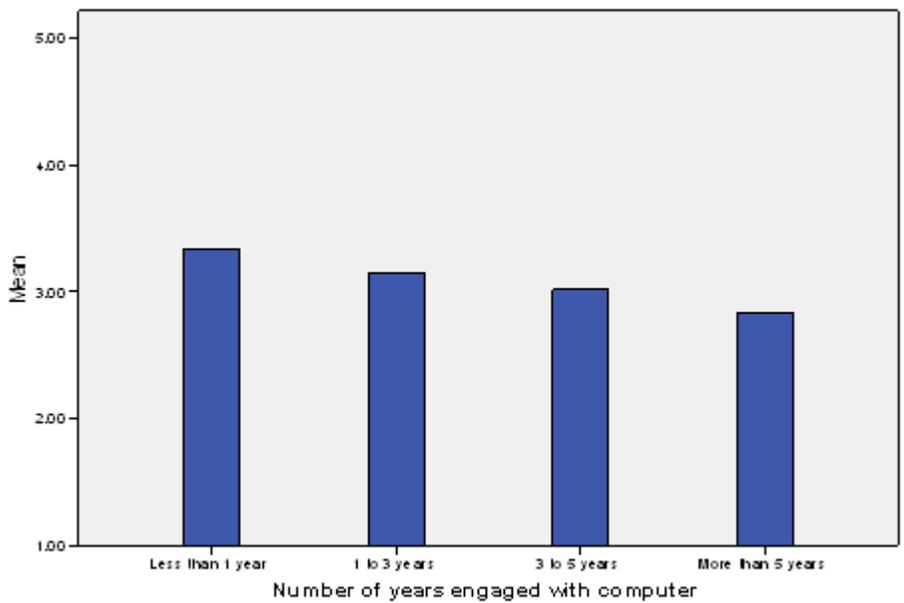


Figure 2: Frequency of computer use and number of years engaged with computer

Table 2
Students' ICT Ability

Item No	Types of computer applications students use	Valid Percent ²				Mean (1-5)	SD
		1	2	3	4		
1	Start a computer game	90.2	7.8	1.5	0.5	1.12	0.42
2	Use software to find and get rid of computer viruses	43.3	29.8	23.2	3.7	1.87	0.89
3	Open a file	95.6	3.3	0.8	0.3	1.06	0.29
4	Create/edit a document	92.0	5.5	1.8	0.7	1.11	0.42
5	Scroll a document up and down a screen	96.1	2.5	0.9	0.5	1.06	0.32
6	Use a database to produce a list of addresses	67.5	22.6	6.9	3.0	1.45	0.75
7	Copy a file from a floppy disk	88.7	7.7	2.9	0.7	1.16	0.48
8	Save a computer document or file	96.2	2.6	0.8	0.4	1.05	0.29
9	Print a computer document or file	96.6	2.4	0.7	0.3	1.05	0.28
10	Delete a computer document or file	95.7	3.0	0.9	0.4	1.06	0.32
11	Move files from one place to another on a computer	88.7	8.6	2.1	0.5	1.14	0.44
12	Get on to the internet	96.6	2.4	0.7	0.3	1.05	0.27
13	Copy or download files from the internet	85.8	10.4	3.2	0.6	1.19	0.5
14	Attach a file on an e-mail message	75.9	16.4	6.2	1.6	1.34	0.67
15	Create a computer program (e.g., Logo, Pascal)	27.5	33.3	30.7	8.5	2.20	0.94
16	Use a spread sheet to plot a graph	58.5	27.9	10.3	3.3	1.59	0.81
17	Create a presentation (e.g., using PowerPoint)	77.4	16.8	4.5	1.4	1.30	0.62
18	Play computer games	92.6	5.9	1.3	0.3	1.09	0.35
19	Download music from the internet	78.5	14.7	5.9	0.9	1.29	0.62
20	Create a multi-media presentation	47.8	35.2	14.7	2.3	1.71	0.79
21	Draw pictures using a mouse	88.5	8.1	2.8	0.6	1.16	0.48
22	Write and send e-mails	92.0	5.3	2.0	0.7	1.11	0.43
23	Construct a web page	36.6	39.0	21.6	2.9	1.91	0.83
Mean of computer ability						1.31	0.33

² **Response Scale:** 1 = I can do this very well by myself, 2 = I can do this with the help from someone, 3 = I know what this means but I cannot do it, and 4 = I don't know what this means.

Student's ICT Ability

Research Question 3 and 4

The findings, as shown in Table 2, have shown that most students have the ability to operate a wide range of computer applications ($M = 1.31$, $SD = 0.33$) such as “starting a computer game” ($M = 1.12$, $SD = 0.42$), “open a file” ($M = 1.06$, $SD = 0.29$), “create/edit a document” ($M = 1.11$, $SD = 0.42$), “managing files such as copying ($M = 1.16$, $SD = 0.48$) and deleting ($M = 1.06$, $SD = 0.32$)”, “internet ($M = 1.05$, $SD = 0.27$), “create presentation” ($M = 1.30$, $SD = 0.62$) and “write and send emails” ($M = 1.11$, $SD = 0.43$).

The overall mean score ($M = 1.31$, less than 1.5) also indicates that the students can do most of the computer applications very well by themselves. In other words, they do not need any assistance from other persons. The only applications that students may seek support or assistance are “using software to find and get rid of viruses” ($M = 1.87$, $SD = 0.89$), “create a computer program” ($M = 2.20$, $SD = 0.94$), “using a spreadsheet to plot a graph” ($M = 1.59$, $SD = 0.81$), and “create a multi-media presentation” ($M = 1.71$, $SD = 0.79$). This could be the case because all these three applications require them to have advanced computer skills.

With regard to ICT ability and gender differences, the findings, as shown in figure 3, suggested that male students are more competent in using ICT ($M = 1.27$) than the female students ($M = 1.35$). Despite their difference in ICT competence, both male and female students, as indicated by their mean score ($M =$ less than 1.50), are categorized as competent users.

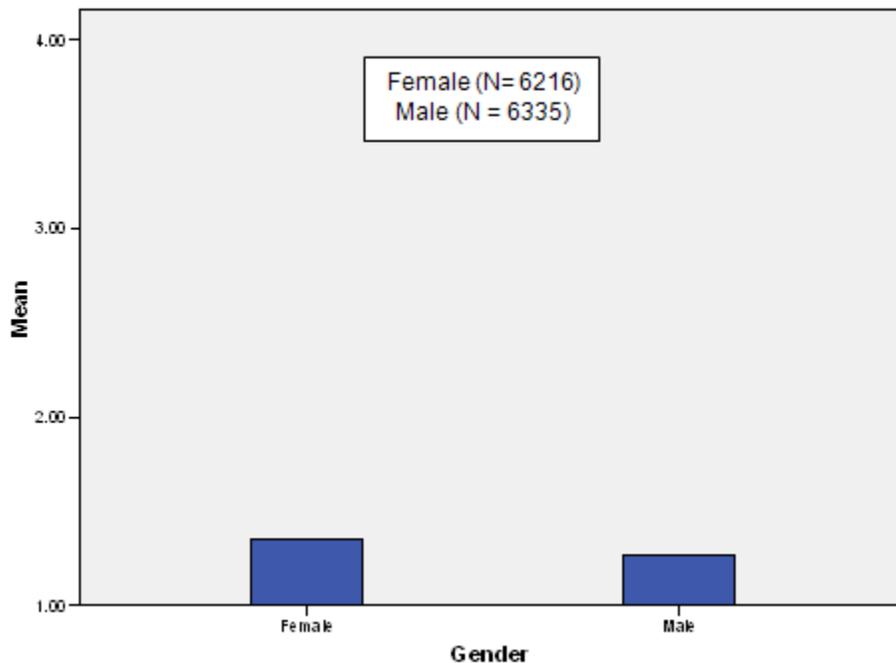


Figure 3. ICT ability and gender differences

The findings, as shown in figure 4, also revealed that differences in the number of years in using computers affect students' ICT ability differences. The students with more years (in using ICT) are more competent than those with fewer years.

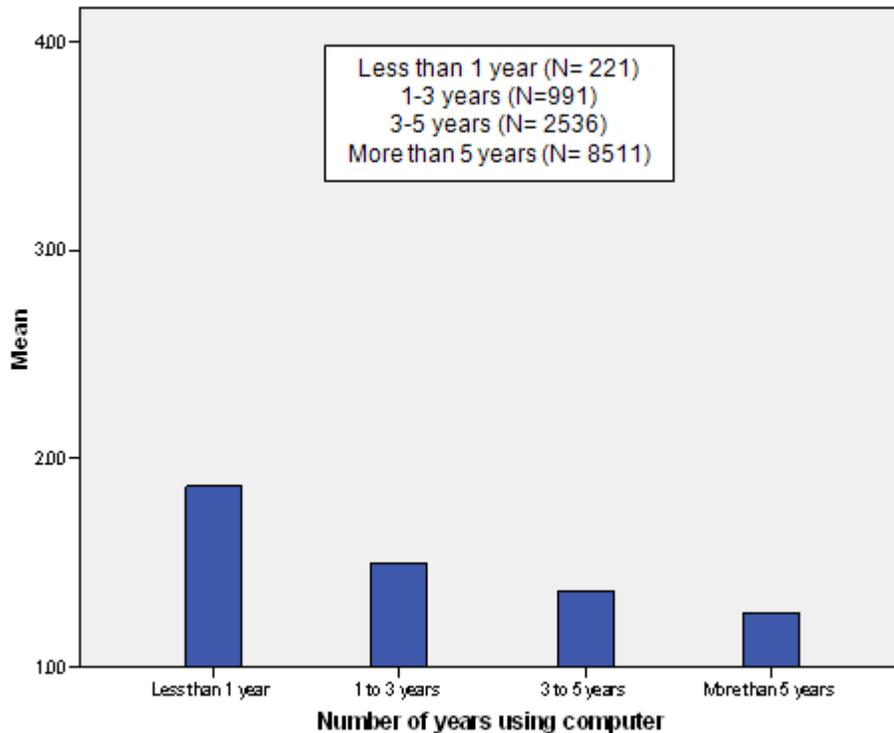


Figure 4. ICT ability and number of years using computer

Discussion

The findings suggest that generally Australian students can be considered as the frequent users of ICT and this is a good indication for the successful implementation of ICT integration into teaching and learning. As Keengwee (2007) advises, the success of ICT integration does not only depend on how much money spent for the procurement of technology facilities, but also depends on how frequently they are used for facilitating teaching and learning.

The findings also indicate that Australian students are competent in using ICT. The majority of them do not have any difficulty in operating a wide range of computer applications including word processing, sending and receiving emails, creating and saving files and so forth. It is suggested that students' ability in using ICT is also one important factor which can help determine the success of ICT integration (Marwan, 2008).

It is also revealed in the findings that male students generally use ICT more frequently than the female students. They are also more competent in ICT than their female counterparts. This is consistent with the findings of other studies (e.g., Looker & Thiessen, 2003; Reddick et al., 2000; Rideout, 2000) which indicate that male students are more competent in the use of ICT than the female students.

Implication and Recommendation for Future Research

Australian students' ability and frequency of use of ICT may be as the result of effective introduction of ICT in the schools. If this is the case, the focus of ICT integration should be directed to achieve the effective attainment of knowledge through technology. That is, teachers

should be aware that efforts need to be made to ensure that teaching using ICT can provide better learning outcomes than that of the conventional teaching.

The present study only looks at how frequently and how well students can use ICT. It, however, does not investigate the effectiveness of ICT in helping students gain better learning (or more knowledge). Thus, it opens up the possibility for the conduct of further study which investigates how well ICT can provide better learning outcomes for students.

In addition, the current research is conducted within the framework of quantitative inquiry. As argued, this type of research may have limitations in terms of the depth of information it can attain. Thus, further research for better understanding students' use of ICT can also be conducted in the form of qualitative research.

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Editor's Note: Fellow educators: *"If you have tears... prepare to shed them now!*^{Julius Caesar.}"

At every level and arena of the teaching–learning continuum, this is the endemic crisis throughout education systems in many countries. Extraordinary challenges await solutions. We need them now!

Zambian School Administrators and Teachers Speak Out: "The Challenges Are Too Many"

Carolyn M. Thomas

Zambia/USA

Keywords: Zambia, education, distance learning, distance education, Sub-Saharan Africa, higher education

Introduction

Current literature on distance learning supports the premise that effective learning can occur without the constant presence of face-to-face teachers. The Commonwealth of Learning is an intergovernmental organization created by Commonwealth Heads of Government to encourage the development and sharing of distance learning education knowledge, resources and technologies (Dhanarajan, 2001). Zambia is a part of this organization and was specifically mentioned in a 1991 report as a country with "a television/radio network and/or rural telecommunications infrastructure appropriate for cost-effective implementation of distance education" (Commonwealth of Learning, 1991, p. 2).

A 2003 report by the Association for the Development of Education in Africa, under the auspices of the Commonwealth of Learning, states there has been a growing interest in Sub-Saharan Africa (SSA) in the possibilities of distance learning as an increasingly important and credible part of education delivery strategies designed to provide greater access to quality education (Mays, 2003). Indeed, the current Zambian governmental education document, *Educating Our Future*, states that the Ministry of Education "will promote open learning, lifelong education, and a variety of mechanisms for continuing and distance learning" (Ministry of Education, 1996, p. 80). There is much agreement regarding the potential effectiveness of distance learning programs in Sub-Saharan countries, including Zambia.

As early as 1989 several success stories in distance education in Africa were described; however, distance education largely remains underdeveloped in Africa mainly because of underfunding (Moyo, 2003). This article addresses the reality of the educational state of affairs that Zambian teachers face when attempting to complete higher education degrees by means of distance learning. Although this article focuses on Zambia, the basic premises can be generalized to other Sub-Saharan countries with similar circumstances. In this article, the words of actual administrators and teachers within the country authenticate the reality of their plight as they struggle against overwhelming odds in their pursuit of university degrees utilizing distance learning. Their words portray a realistic picture of the complexities of distance learning in developing countries.

Zambia is a democratic republic located in Sub-Saharan Africa, having gained its independence in 1964 from Great Britain following forty years of direct rule by the British (Küster, 1999). At the time of independence there were only 961 college graduates in the country, all of whom attended a university outside of Zambia since there were no universities or colleges in the country prior to 1966 (Kelly, 1999). Immediately after independence the state government acquired almost total control of the educational system and quickly expanded it. In 1966, the University of Zambia was opened, and between the years 1966 and 1977 five new primary teacher-training colleges were opened in addition to two new secondary teacher-training colleges. At independence, the country already had six teacher-training colleges, which brought the total number of teacher-training colleges in Zambia to thirteen (Manchishi, 2004).

Teacher education colleges have three levels of training. The first level is the certificate level, which prepares students to teach in Grades 1 – 7 in lower and middle primary schools. To enter these colleges, students must have a Grade 12 Certificate or a General Certificate of Education. The study time for this certificate is two years, with the first year in college and the second year teaching in a classroom. There are currently ten teacher training colleges that give certificates. The second level is the diploma level, which is required to teach in upper basic education Grades 8 and 9. These students have an additional one year program (or one and a half years by distance learning) and also specialize in two teaching subjects. There are five colleges these students can attend to obtain a diploma, all of which include a distance learning program. The third level is the degree level for teachers of Grades 10-12 in secondary schools, and comprises two additional years of study beyond a certificate program. Students must attend a college affiliated with the University of Zambia to obtain their degree (Manchishi, 2004). Interestingly, teachers of commercial subjects such as agricultural science and industrial arts are trained in institutions which are not teacher training colleges and are under the auspices of government ministries other than the Ministry of Education (Manchishi, 2004).

While the Ministry of Education has established the requirements to qualify people to teach, some of the teachers actually teaching in the classrooms have not completed these requirements. In a 1998 survey sponsored by UNESCO and the Ministry of Education, the teaching qualifications of all sixth grade teachers throughout the nine provinces of Zambia were recorded. All primary teachers of Grades 1 to 7 in Zambia are expected to have completed a minimum of twelve grades of primary and secondary education, as well as two years of pre-service teacher training. The research showed that 81 per cent of all sixth grade teachers completed Grade 12 and 58 per cent completed the two pre-service years of training. However, results from the same survey revealed that 96 per cent of Grade 6 students attended schools where their headmasters had completed the required two years of pre-service teacher training (Nkamba & Kanyika, 1998).

Fortunately, these statistics are now out of date; standards of teacher education have risen since the late 1990s. During recent research conducted in 2006 in Choma District, Zambia, I found that 86 per cent of the 148 teacher participants in the study have completed the required two years of teacher training. In addition, many of these teachers, especially those teaching Grades 7 and 8, are taking classes toward their diplomas and/or degrees or have already completed them.

There are disparaging conditions in Zambia which mitigate the effectiveness of distance learning. Globally distance education is transforming the way people learn. However, the change has not been as significant in the developing world, with “the digital divide” in the information and communication technology greatest between Africa and much of the developed world (Moyo, 2003). Distance education remains underdeveloped in Sub-Saharan Africa largely due to underfunding, lack of skilled personnel and a lack of strong commitment by governmental leaders. Zambia suffers under the scourge of HIV/AIDS and extreme poverty, which siphons available funds from distance learning endeavors. According to the 2002 Zambia Demographic Health Survey, 16.5 per cent of the population aged 15 - 49 is HIV positive (Organisation for Economic Co-operation and Development, 2005). Approximately 21.5 per cent of the total population of Zambia is estimated to have HIV/AIDS, with higher numbers of professionals, including teachers, infected (Wood, Berry, Tambulukani, Sikwibele, & Kanyika, 2003). With a population of over 11 million, Zambia ranks 143 out of 162 on the 2001 United Nations Human Development Report (Verhagen, 2002). Additionally, 73 per cent of the population is classified as living below the poverty line. Income is unequally distributed, with the top 20 per cent of the population receiving 57 per cent of the per capita income, while the bottom 40 per cent receive 11 per cent (Verhagen, 2002). Consequently, due to these two overwhelming concerns, funds designated for education in general, including distance learning, are severely limited.

In 2006, I interviewed 36 administrators and teachers from basic schools in Choma District, Zambia. Of the teachers who were interviewed, 75 per cent are either currently enrolled or plan to enroll in a diploma or degree program. The 25 per cent who are not enrolled in a program are close to retirement age. Their responses reflect strong feelings about the status of distance learning in Zambia. In order for the teachers to obtain a diploma, they must complete at least one to two years of distance learning while they are still teaching fulltime. To obtain a degree, they must attend a university for at least one year of fulltime study. However, there are significant obstacles that hinder their pursuit of further education which are unique to developing countries:

1. difficulty completing their degree program onsite at a university (a requirement of degree programs in Zambia) with no means of obtaining income to support their families at home;
2. the long wait for another teaching posting (position), sometimes two to three years after they have completed their degree program; and
3. the possibility that when a posting *is* secured, there will not be a commensurate pay raise. School administrators in Choma District, Zambia, spoke quite candidly about these concerns in interviews with them.

An extremely critical theme for teacher training, which kept reappearing throughout the interviews, was the problem of financing continuing education through distance learning. Many teachers are enrolled in distance learning programs to obtain their diplomas or degrees; the number of teachers enrolled in a distance learning program during 2003 was 4,500 throughout Zambia. The National In-Service Teachers' College, one of the largest distance learning colleges in Zambia, can only accommodate 500 teachers per year (Longe, 2003). The University of Zambia accepted only 360 students out of 2,580 distance learner applications in 2003 (Chishimba, 2002). Although it is difficult to gain admission in one of the distance learning colleges, several of the teachers and administrators interviewed were already admitted, but were frustrated with the prospect of not being able to afford the payments to attend the university fulltime. If they resign their current teaching posts to attend school, they may not be reinstated upon completion of the course and will be required to wait several years for a new posting. One teacher discussed the problem of going for further studies:

Some conditions are not favorable for teachers. You see if you want to go for further studies you are told you resign first...or you have to sponsor yourself. Now where do you get that money? You resign and again you sponsor yourself to that school. Those are some of the challenges we are facing as teachers. (Teacher B2, personal communication, August 2, 2006)

A deputy head who desires to attend a university stated:

I would like to maybe go to university. Except that maybe now again, you see, that's another challenge because things are not very easy now. Why? It's because the policy now is that, in our districts, the district can only sponsor four teachers per year in all the Choma district. And we are 1000 plus teachers! Now if I wait until my turn comes, who knows? By that time I will be too old...I will approach retirement. And then if I tell the government...okay, fine, I want to sponsor myself so that I can do it quickly in my own time... the government will say....now therein we are going to move you out of the payroll. Now if I don't get my salary how do I support myself? And yet it was going to be easier for me if I supported myself because then the government would spend little or nothing on me. But again if I am told they withdraw the salary from me, how do I make ends meet? How do I pay for my school? So, much as I would want to go for further studies as quickly as possible, that becomes a bottleneck. (Deputy Head C, personal communication, August 4, 2006)

The following interview quotation was stated by a teacher who is already enrolled in a degree program at The University of Zambia, which will eventually require him to become a fulltime student for two years. He commented:

It's supposed to take five years. Otherwise the first three years I'm supposed to do it on distance and then for the last two years I'm supposed to go for full time. Yeah, now that's where the confrontation is in the Ministry of Education. They're saying, you know you should go for full time, you should be having to go for full time. Then we are scrapped off the pay list, the pay roll. It's like you go on unpaid leave. When you are off the pay sheet, you sponsor yourself. When you come back, you have to re-apply to be a teacher under the Ministry of Education. So it's quite confusing. So we are trying to maybe talk to the management, saying, "why can't we finish on distance?" Because if I have to stop work today, where do I get the money to sponsor myself? Otherwise I'm willing to sacrifice the little that I have on distance. Like this year we are supposed to pay 1.6 million towards the tutorial...1,600,000 kwacha (\$ 440.) just for tutorials! And maybe the examination. The rest...I have to cook for myself when I'm there, to buy my own food and materials, study books and stuff. So it's quite expensive. They are saying for the last two years I ought to go there so that I complete my course. But that is much more expensive to go on full time because it's seven million, eight million, somewhere there, per semester, which is quite expensive. (Teacher A1, personal communication, August 1, 2006)

This level of frustration is pervasive among teachers industrious enough to desire a higher educational degree. This same teacher continued, "They are saying we need to improve the quality of teachers. That's what we are trying to do. I'm striving on my own but the government doesn't want to come in and help me out. So I don't know."

Another teacher who already completed his diploma and is hoping to begin a degree program commented, "But the way it is in Zambia here, when you want to get training, you have to, maybe...you are asked to go on an unpaid study leave, so that is a discouragement. You'll find it greatly demoralizes the teachers" (Teacher D2, personal communication, August 3, 2006). The problem is exacerbated because there are no government educational loans available for teachers and the prospect of waiting for a new posting after completing a degree program is extremely disheartening.

A second recurring theme in the interviews was the extended length of time for graduates of teacher training colleges to get posted after they have completed their degrees. It is a well-documented fact that classes are crowded and student/teacher ratios are very high. In spite of these glaring needs, teachers usually wait two or three years until they are posted because there are insufficient funds in the education budget to hire the necessary number of teachers each year. One deputy head commented on this situation:

When I was completing my training, I got employed before my results were out. So by the time my results were out...by the time I got my diploma...I was already employed and teaching. But of late, the system has changed...two years, three years. Some have waited for three years. (Deputy Head A, personal communication, August 1, 2006)

One headmaster has still not seen a change in posting time, despite rumors of decreased wait time:

It's getting worse and definitely impacting negatively on the teacher that comes because by the time he has come out to actually start work he has been off the line of teaching for three or four years... all the methods are forgotten. He's just as good as somebody that would have come from the street. That's how I look at it myself. When they're in college,

they have a chance to maybe plan lessons for a short time, then they go away for a period of four years without ever writing a lesson plan. When they come back even the books that they were learning to use are no longer the ones that they use...these new books...so this teacher just comes as a new person. That's why they are finding it difficult to teach and they are finding it difficult to teach! (Headmaster D, personal communication, August 3, 2006)

One Grade 6 teacher commented, "I completed in 2002 and I started in 2005." (Teacher D1, personal communication, August 3, 2006). In spite of the desperate need for teachers to reduce student to teacher ratios in both rural and urban schools, postings are very slow.

Teachers are motivated to pursue higher educational degrees for several reasons. One reason, of course, is the hope of increased income, with the salary scale for all teachers supposedly based on additional education, or "upgrades". However, the pay increase does not always materialize after further education is completed. When asked if there are differences in teachers' salaries depending on years of teaching experience, one deputy head replied:

There is supposed to be. But it's not always there. And this is one of the issues that our unions have discussing with the government. There's a system which they call the notch system. At your entry you're paid so much. And every year you're supposed to have an increase. And automatically it should increase...you don't have to negotiate that. It's supposed to be an automatic increment. So that the one who starts today will not have exactly the same salary as the one who started five/ten years ago, even if you have the same qualification. So you get something for the experience. But it hasn't been effective. Most teachers notice that from their paychecks they are not getting their yearly notches. And so you find a teacher who has been teaching for fifteen years sometimes will have even a lower salary than the one who started this year. We have had such situations. (Deputy Head A, personal communication, August 1, 2006)

Further clarification came from another teacher:

The truth is the one who is starting now and the one who has taught for 33 years...we have the same salary. So there's nothing like saying this one has started this year so the salary should be higher. We are all at the same rate, provided you are a teacher... and the problem is they are not looking at the qualifications of somebody, even if one has gone for a degree...for a diploma... the salary will be the same with the one who has just started. That is a big problem. I don't know why the government cannot revise on that one. (Teacher F2, personal interview, August 4, 2006)

Concurrence regarding widespread discrepancies within the salary scale was supported in comments by a third teacher:

When you are posted (receive a teaching assignment from the Ministry of Education) you'll be teaching and you are considered to be on probation. Then you are put on a certain scale. After probation period, when you are confirmed, then you'll be put on another scale. Now that is where...no matter how long you'll be teaching, if you are not promoted, then you will be on the same salary. It (probation) is supposed to be six months...yes...but the problem is that we have teachers who have been teaching maybe for 12 years and they are still on probation. They have not been promoted...just because it has not happened...just because maybe there are maybe mistakes in the offices somewhere. It takes time for someone to be put on another scale after he or she has upgraded. (Teacher E4, personal communication, July 31, 2006)

Despite these inherent discrepancies, teachers continue to apply for entrance to diploma and degree programs. Whereas in the United States some teachers obtain master's degrees solely for a pay raise, Zambians have no assurance of an increase in pay after they complete their schooling.

Conclusions

The obstacles teachers face in their careers are monumental. Common themes throughout the interviews reveal their frustrations with trying to advance their education, but yet they are committed to teaching the children in their classrooms. They are very aware that governmental support and commitment is the key to the success of the Zambian national distance education program. However, with the high prevalence of HIV/AIDS and extreme poverty throughout the country, governmental financial support for distance learning is, by default, inadequate. One headmaster with many years of teaching and administrative experience made this emotionally-charged statement, "I feel if they (the government) are putting effort, it's not enough...it's not enough, honestly, it's not enough. They could do better, they could do better" (Headmaster D, personal communication, August 3, 2006).

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