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Table of Contents – July 2010

Editorial

Curriculum and Technology

Donald G. Perrin

Instructional design is like a jigsaw puzzle. Many pieces are required to prepare a successful course of study. It includes a gamut of curriculum content, interactive and dissemination media, materials, experiences, participation, and human support. For many years curriculum was a verbal list of content and skills for the teacher to interpret and implement. Teachers produced most of their own teaching materials, supplemented by "visual aids" - realia, films, filmstrips, and gramophone recordings – where they existed. Companies developed "aids" and sold them to schools and teachers; other materials were sponsored by companies such as coca-cola.

The launching of Sputnik showed American education to be lacking in science, mathematics, and technology. Federal funding through the National Defense and Education Act, Elementary and Secondary Education Act, Higher Education Act, and Vocational Education Act spurred reexamination of curriculum and teaching methods. It was found that textbooks were outdated and even inaccurate. And schools did not have the necessary apparatus and materials for instruction.

National curriculum projects were initiated in a range of disciplines –Physical Sciences Study Committee, Biological Sciences Study Committee, and there were many more. President Kennedy's goal to put a man on the moon "before the decade is out" created a new urgency for perfecting, dissemination, and adoption of these new materials. There was no budget to retrain every teacher, so materials were designed for students to use with the assistance of their teachers. In this way, the new curriculum could be rapidly implemented. A second problem was that new materials and equipment was needed for instruction. Ingenious solutions included simple devices that could be improvised from available materials such as tin cans and string. Often the students could fabricate what was needed for the lesson. There was a paradigm shift in what was taught and the way students learned. Until that time, the materials to support a new curriculum came years later. The idea of integral development of complete teaching-learning systems was born.

In this same period, experimentation with new media supported a second paradigm shift – from mass or large group media like films, television and filmstrips, to individualized media such as language labs, teaching machines, and computers. These provided interactive experiences and paved the way for individualized educational programs and distance learning. These new tools were effective in learning situations where individual differences made traditional instruction ineffective and impractical.

The architects of instructional design realized there were different kinds of learning – cognitive, affective, and psychomotor. Traditional instruction was aimed at knowledge and comprehension that ws easily measured by multiple choice tests and short essay questions. Instruction and testing for higher levels of learning was poorly represented in teacher training, curriculum development, and in classroom teaching and learning. Researchers such as Bloom and Mager introduced behavioral objectives that described outcomes and set benchmarks for every level of learning. These were later modified to performance objectives with rubrics to assess progress toward the criterion. In the hands of instructional designers and instructional technologists, teaching and learning was enhanced for an increasingly broader spectrum of students.

Unfortunately, student differences were amplified by the Civil Rights Movement –integration of cultures and levels of society that were previously separated. Bussing, and mainstreaming of students with disabilities into regular classrooms moved us from homogenous grouping to heterogeneous groups with a great diversity of cultures, languages, and educational preparation. The social objectives of these programs were a major step forward, but special training and

resources for teaching and learning with heterogeneous groups were not part of the implementation plan. As a result, teachers were over-burdened, schools were stressed, budgets were reduced, and blame was shared by the entire education establishment. These problems were greatly exacerbated by the recent downturn in the economy.

As in the period of Sputnik, the relevance and value of curriculum and education programs are facing scrutiny. Is the curriculum – knowledge, skills and experiences - relevant to the world into which students will graduate? Government regulations that once protected schools and students now constrain realistic solutions for today's problems. Charter Schools, outsourcing to industry, and alternative models of teaching and learning are being tested, but results are mixed. Major policy decisions are being made by politicians, parents, and PTAs (parent-teacher associations) that overrule the advice of educators, researchers and practitioners. There is a continual tug-of-war between back to basics and moving forward. Everyone seems to have a different solution. The result is chaos.

The world has undergone a number of paradigm shifts that are yet to be reflected in our educational systems. Like the economic collapse, it provides an opportunity to make necessary changes and make the system more responsive, efficient, and relevant. Do we have all of the tools, people and ideas to shape the educational systems required for this millennium?

Editor's Note: This research provides valuable insights into teaching and learning using various web tools to expand the classroom dialog and enrich distance learning. It offers interesting and provocative support of peer teaching and learning.

Podcast and Reciprocal Peer Tutoring in Support of Teaching and Learning

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Abstract

We are abounding with technologies. Some of them are suitable in an educational setting while others are not. The question is: "Do we use technology to differentiate or are we differentiating technologies?" If we are differentiating technologies, then we fail to tap into the strengths of the technologies in teaching and learning. We fail to go beyond the technical aspects of the instruments and, as such, they will remain as instruments per se. This paper attempts to put forward to you education technologies in the forms of hardware and software and how they are blended together to achieve effective communications. These technologies include podcast, reciprocal peer tutoring, eBeam and MIMIO pad. Some research findings are discussed to lend support to the technologies used.

Keywords: education technology, podcast, reciprocal peer tutoring

Introduction

The word technology, whether related to education or otherwise, is always erroneously linked to hardware only. Institutions and companies can spend millions investing in the hardware and do not get the envisaged returns. One of the possible reasons is lack of software, especially in the education setting. This paper will discuss how podcast, a series of video or audio files available on the Internet, can be used to support learning. It is necessary to subscribe to RSS to keep in touch with the latest developments in podcast, online news, blogs, photos, and whatever is needed in learning or work assignments. According to McLaughlin (2006), podcast is one of the new media streams that is also suitable for a traditional lecture style and it is of keen interest to the academics and practitioners. Podcast gains massive popularity because it can meet students' mobile and lifestyle needs by allowing them to listen to lecturer's notes in an environment of their choosing (Bongey, 2006).

This paper will also discuss some hardware like eBeam and MIMIO pad which the author finds very useful in support of his presentations. Again this hardware will be discussed in relation to the teaching methods and presentation skills. Briefly, eBeam is a portable device which can easily convert an ordinary whiteboard into a smart-board capable of recording, playback, enlarging and even supporting video and Internet. The MIMIO pad is portable and light weight; everything written on it gets projected on the screen and the written work can be saved and played back.

The subsequent education technology software under discussion in this paper is Reciprocal Peer Tutoring (RPT) developed by John Fantuzzo in 1984. This strategy is given a new twist by throwing in education technologies like email, lecture-text in SMS format, and e-assessment. The strategy works well by providing each other (two persons or a small group of four persons) mutual support through prompting, evaluating, monitoring, setting and conducting tests on one another. The interactions here imply both verbal and non-verbal communications which form the basis of any teaching method. Research on RPT conducted in the Philippines and in the West will be discussed.

Background

There is a constant call for the use of technology in support of collaborative learning and, in particular, blended learning. The primary aim is to provide an environment that supports collaboration between students on-campus as well as students who are geographically distributed to enhance their learning processes (Kreijns, Kirschner & Jochems, 2003), and facilitate collective learning and group cognition (Stahl, 2006). Universities in Malaysia, as well as around the world, are moving towards student-centred learning in response to the social demands of a highly diverse, interdependent, and technologically rich workplace that calls for teamwork (UNESCO, 2005). When our students graduate they will find themselves in workspace that is increasingly a virtual one where work is done by individuals who are distributed in time and place. Hence, if we fail to equip our students with social interactive online communicative skills they may find themselves unemployable. These are soft skills which are attainable through blended learning and online forum discussion.

Besides blending face-to-face to online mode of teaching, we can also blend podcast to learning activities. Podcast which is a combination of iPod and broadcasting is fast gaining popularity. A Google search on September 28, 2004 brought up 24 hits. About a year later, on August 28, 2005, another Google search returned over 21 million hits and on September 18, the same year, a Google search exceeded 60 million's (Campbell, 2005). Podcast is highly popular because it is easy to use. With a podcatcher (RSS aggregator) a listener can subscribe to his or her favourite podcasts which will then be downloaded automatically to a computer at the listener's convenience time. Once it is downloaded it can be played over a car stereo, headphones, MP3 player, and computer speakers. A student can listen to a podcast while driving to college, walking or exercising in a gym and even traveling on vacation.

To tap into the potential of this technology, an educator must incorporate instructional strategies involving podcast. Podagogy.com suggests a combination of Keller's ARCS model with Gagne's Nine Instructional Events. One must always remember it is the instructional strategies that drive the technology and not the other way round. Hence, we have to blend podcast with learning activities in support of outcome based education.

Podcasting has already become an important component of work routines and job expectations in some fields. For instance, a modern day journalist is given a chance to contribute "his news and have it published under the company's brand name" (Outing, 2006). Many studies on podcasting were carried out in Britain and United States. In the States, distance learning students gained personalized attention from the lecturer through podcast. Recently, Open University in the United Kingdom introduced podcast for students who need flexibility and other universities followed suit to provide coverage of guest lecturers (Shim et al., 2006a). In Australia, Hartfield (2009) reported podcasts focused the students' attention to core learning concepts and supported them in their understanding and learning of the lecture materials. Unfortunately, Asia is slow in catching up with new technology. For instance, Japan, Korea, and Hong Kong once lagged behind the West in information technology (Shim et al., 2006a). Traditionally, in Asia we tend to follow rather than to lead. It is time to review this tendency and move on to discovery.

Another technology under consideration is Reciprocal Peer Tutoring (RPT). This technology has been used extensively in schools and universities and it helps students improve their academic skills (Choudhury, 2002; Gartner and Riessman, 1994). In RPT students play two roles: tutors and the tutored. They ask each other a set of questions and provide tutorials when the answers given are not as expected. This dual role is beneficial to students because as tutors they have to master the content in order to teach and to set questions. Subsequently, as tutees, (the tutored), they learn from their peers and share knowledge as well.

Reciprocal peer tutoring is used successfully in Nigeria and it has significant impact on the enhancement of career choices among secondary school adolescents (Obiunu, 2008). In another study in Nigeria, RPT results in higher student academic achievement and greater productivity, more caring, supportive and committed relationships among students and greater psychological health, social competence, and self-esteem (Uwameiye and Asuwa-Ogiegbaen, 2006). In the Philippines, Henson (2009) reported a significant improvement in her students' performance in college algebra and she recommended using RPT in other courses as well. In the West and in the United States, RPT is used extensively with significant success in improving academic achievement of the students. For instance, in Texas A&M University RPT was found to have a significant positive effect on student performance and students agreed that the technique forced them to apply the course content and provided additional review and practice (Choudhury, 2002). However, in Malaysia we need to carry out more research on RPT and one big obstacle to overcome is the student's lack of trust in peer tutoring.

The eBeam is a device that can effectively convert an ordinary whiteboard, in fact any hard surface like a wall, into a smart-board. The Scrapbook Pages in eBeam can be shared over the Internet or Intranet with anyone anywhere. Images, PowerPoint, Excel, and WORD can be imported directly into the Scrapbook and changes to the Page are shared in real-time. The Recorder feature can create movies complete with audio and the movie files saved in .avi, .wmv, or .swf (Flash) format. This technology by itself does not mean much to teaching and learning. In this paper, the author will show how it can be incorporated into reciprocal peer tutoring and even used together with podcast. Together with eBeam the author will also discuss another device called MIMIO Pad in relation to teaching and learning.

Podcast

Intellectual Property

When lecturers develop podcasts to support their teaching and students' learning, who owns the intellectual property? To some, he answer may seem obvious; the lecturers of course. But, in some institutions in Asia it is not so obvious. All academic material written and developed belongs to the institution. In such a situation, lecturers may be discouraged to develop new teaching methods.

There should be a win-win situation here. Let the lecturer keep the intellectual property rights and the institution can share the glory and a certain percentage of the capital gain. The author believes this is the normal practice across the world and it will certainly benefit the institution, lecturers and students alike.

Capturing Class Discussions

Group discussions in the class can be recorded using either eBeam or MIMIO pad. Of course, after editing (if necessary) it will lend good support to your episode series of podcasts. You can use it to start your podcast or it can be an episode itself.

Notes written on the scrapbook pages in eBeam will serve as supporting documents for podcast. Students can refer to the scrapbook pages for reference after listening to the audio.

Teaching and Learning with Podcast

Do we need a podcast to cover a 2-hour lecture? In the author's opinion, no. This is because a podcast should complement the lecture, not replace it. It should be used to guide students on pertinent points to comprehend in the lecture, points to ponder and reflect for deeper understanding, and points to research and debate in small group discussions in the class. According to Shim et al. (2007) podcast should supplement class teaching materials for better understanding of concepts and applications that may not have been available during the class.

A podcast can be used to support blended learning in offline mode. Learning activities designed by the lecturer can be explained verbally. In this way, a podcast can function like a virtual lecturer talking to students, keeping focus in their learning activities and morally supporting them to push on in their studies.

It is pertinent that lecturers blend well the classroom activities with podcast materials. In this manner, the podcast will help reinforce students' understandings in the class by giving them further learning activities such as reading, listening to talk, watching video, and reflecting on certain concepts. Of course, the outcomes of these learning activities will be discussed in class.

Podcast Rating and Absenteeism

According to recent Bridge Ratings, podcast growth is expected to reach a critical mass in 2010 exceeding 45 million users (Bridge Ratings, 2005b). The efforts of Purdue University to podcast over 90 courses and the existence of Apple's iTunes University are evidence of podcasting's impact on education.

Is the availability of podcast to be blamed for a decline in student attendance? According to a newspaper article entitled "The iPod took my seat", yes, there is a dramatic fall in the attendance where only 20 students out of a total enrollment of 200 showed up for class (Silverstein, 2006). However, an article in the College Student Journal disputed the newspaper article and claimed that students are motivated to attend class out of interest in the lecturer and materials delivered (Gump, 2004). Similarly, in Dr. Gerald Cizadlo's class in the College of St. Scholastica they did not experience the same trend as reported in the newspaper (Hoover, 2006).

In a survey carried out by Bongey et al. (2006), students do not use podcast to avoid attending class, in fact, they used it to improve their understanding of lecture materials. They also find it useful to revise for their examination and to review confusing and complex information.

Creating a Podcast

You can use the same strategy as in teaching to start your audio recording, that is, a set induction. Catch your student's attention to your recording through relevant speech from a famous person, appropriate music, announcement of a big event, or even simple learning outcomes to achieve in the podcast.

There are no specific rules to the length of the recording. But normally each episode of your podcast should last 20 to 30 minutes. Research has shown that this is the length of time preferred by the students.

Do not read from prepared notes. You will sound artificial and monotonous. If needed jot down some points and record it as if you are teaching in the class. It is alright to pause, joke with your students and even have some 'ahs' as they are all natural in any teaching.

Reciprocal Peer Tutoring (RPT)

Students' Trust

When students are first introduced to a student-centred learning approach where they are required to collaborate, discuss and share knowledge among peers, there is an element of trust that is bothering them. They would like to know: "Is my peer teaching me the right thing?" Hence, whether it is reciprocal peer tutoring or blended learning, lecturers have to step in to overcome the doubt of trust.

This issue is pertinent among Asian students, especially the undergraduates. They need to be convinced that under student-centred learning they are learning the right thing and not otherwise. If this issue is left unchecked it will eventually lead to students losing faith in the new approaches, and RPT in particular will fail.

Choosing Peers from Afar

Reciprocal peer tutoring can take place over the Internet or Intranet. This convenience is possible with the aid of eBeam, email, lecture-text in SMS format, and e-assessment. Hence, students can share notes and discuss in real-time at locations far and near if they cannot do so face-to-face. Now, RPT takes on a different dimension: students can choose their peers from another institution of different culture and nationality. It opens the window to a rich learning environment encompassing soft skills which are badly needed in the workplace.

Through lecture-text in SMS format and e-assessment, students are given mobility where they can conduct peer tutoring anywhere, anytime.

Learning with RPT

Students must know how to question each other so as to probe deeper and generate a discussion. They can use guided reciprocal peer questioning technique. A set of generic question stems are as follows:

- What is the best … and why?
- What if …?
- Explain why …?
- How are … and … similar?
- Why is … important?
- How would I use … to …?
- How does … affect …?
- What conclusions can you draw about …?
- What is the main idea of …?

Guided by these question stems, students should be able to come up with higher order questions rather than questions that lead to short answers.

For RPT to function effectively, both the tutor and tutee must carry out self-reading of the topic. In this manner, when the tutor asks some thought provoking questions, the tutee can participate meaningfully in a discussion. RPT is not merely asking and answering questions, both parties must be able to interpret and share knowledge on the topic at hand. Hence, they have to read and research on topic before they meet. It is important to explain to students their duties or functions in RPT so that they can reap maximum benefits from it.

Conducting RPT

You may choose to allow your students to group themselves in pairs. There are advantages and disadvantages of them doing so: good academic students may group together leaving the poorer academic students to fend for themselves. Do we have a problem here? The author believes not. This is because, in such a grouping, you know exactly on which group to focus your attention and to whom to give more assistance.

Give your students a specific topic to discuss and set questions. This topic should be related to the learning activities of the student-centered learning approach. When they shift role between tutor and tutee a new topic should be given to the other tutor.

Another alternative is to ask students to construct 10 multiple choice test questions on certain topics and bring those questions, with answers, to class. They are then paired up and given time to complete the RPT activity. During this activity they exchange questions with their partners, answer and score each other's paper. They will tutor each other on questions not answered correctly. The students' multiple choice questions are collected and treated like any class assignment.

Solutions and Recommendations

Whenever one starts a new instructional strategy it is advisable to engage the catalyst group first and subsequently to set up a support group. One needs to identify a few lecturers who are adventurous and are constantly willing to try new teaching methods. They will form your catalyst group and eventually they will help to promote the new methods to their colleagues. As more and more lecturers are using the new methods, it is essential to set up a support group. This group will assist lecturers who face implementation problems and give them moral support to push on.

In Malaysia, students are very accustomed to a teacher centered approach. Hence, when they are asked to learn from their peers, they do not know how and they do not trust their peers' capabilities to teach them. To overcome this problem, lecturers initially have to step in to confirm the peers' responses as accurate and to explain incomplete answers. It is imperative that lecturers sum up the students' presentations in the class and draw conclusions where appropriate. Once the students learn how to learn, the role of the lecturers in drawing summaries and conclusions can be reduced.

On another note, we can also set up a student learning centre to teach students how to learn and to collaborate to acquire knowledge. For instance, the use of reciprocal peer tutoring and podcasts can support students' learning. Through reciprocal peer questioning they will learn how to ask thought provoking questions and also to probe deeper for a better analysis of the concept learned.

Staff stationed in the Information System Office should be well versed with the latest developments in information technology in a particular server and network system. They should be upgraded regularly through in-house trainings and attending seminars. It is a shame when we have the right teaching technologies to move forward but we don't have the right information system support.

Conclusions

Advancement demands that you move forward, otherwise you are left behind. If moving ahead means progress for all parties involved, that is, students, lecturers and institution management, then we should welcome it.

Every development comes with changes. We have to change to progress or be changed. This paper attempts to put forward to you various education technologies in the forms of hardware and software and how they are blended together to achieve effective communications. Last but not least, are we using technology to differentiate or are we differentiating technologies? If we are differentiating technologies, then we fail to tap into the strengths of the technologies in teaching and learning. If we fail to go beyond the technical aspects of the instruments as such, they will remain as instruments per se.

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Editor's Note: Student preferences is topic not previously reported in this Journal. This interesting, well documented study is republished, with permission, from the Journal of Online Education. It includes courses in a number of contrasting disciplines and is an excellent foundation for further study across a broad cross section of courses, cultures, and levels of education.

Students' Content Preferences for Taking Online Courses

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USA

Abstract

A survey was conducted to determine university students' course taking preferences in different content areas. Courses that were included in this study were taken from the undergraduate catalog of a university in a large and diverse metropolitan area. More than 35,000 students are currently enrolled in this university that serves students from all over the world, including the Caribbean and Latin American countries. One hundred and thirteen students participated in this study. A convenience sampling method was used to select the study participants. The study did find significant differences between males and females in terms of online course taking preferences. There were also significant differences in course taking preferences, online or face to face, between those who have previously completed one or more courses online and those who have not completed any courses online. The implications of the findings of this study for offering online courses are discussed. Suggestions for conducting future studies are also offered.

Introduction

A growing number of educational institutions in the United States of America are offering an increasing array of courses and programs at a distance and more and more students are enrolling such courses. For example, it has been reported that more than "3.9 million students were taking at least one online course during the fall 2007 term; a 12% increase over the number reported the previous year (Allen and Seaman, 2008, p.1). This growth trend is likely to continue for at least several more years before student enrollments in online courses and programs begin to level off.

Need and Rationale for the Study

Educational institutions offer distance education courses and programs for several reasons. A study published by the US Department of Education (Parsad and Lewis, 2008) revealed that the following are some of the reasons why post-secondary institutions of education offer education at a distance:

> The most common factors cited as affecting distance education decisions to a major extent were meeting student demand for flexible schedules (68 percent), providing access to college for students who would otherwise not have access (67 percent), making more courses available (46 percent), and seeking to increase student enrollment (45 percent) (p. 3).
>
> It has also been reported that students prefer to take online courses for reasons that include "*financial reasons*," "*flexibility*" and the "ability to do *coursework at home*" (Braun, 2008: p. 69).

While these reasons are worthy in themselves, they do not take into consideration students' content related preferences for taking or not taking online courses. Kochman and Maddux (2001) who studied differences in the grades of students who took courses in campus-based classrooms and those who took courses at a distance via interactive television student outcomes noted:

> "Course content is another issue. It is possible that the type of content being delivered over interactive televised distance learning affects student outcomes. The differences in student outcomes between the education/science subset and the liberal arts/business subset suggest that this is an area for future investigation." Kochman and Maddux (2001)

Sharp and Cox (2003) contend that every course is not appropriate for distance education. It has also been stated that courses in which students are expected "to develop empathy or other affective orientations may not be suitable" for online delivery (Citation not included to ensure anonymous peer review of the paper and will be included later if the paper is accepted for publication).

However, there is not much research that takes students' content area preferences into account while studying different topics related to distance education. As Levy (2009-2010) noted:

> "With academic success possibly hinging on the discipline or course material, this is certainly an area of distance learning in need of further research" (p. 28).

This study offers a small beginning in the attempt to fill such a gap in the large body of research on various aspects of distance learning.

Purpose of the Study and Research Questions

The purpose of the study is to explore if students prefer to complete courses in certain subject areas in traditional face to face settings or partially online, or fully online. Colleges, universities and other postsecondary institutions of higher learning can use the findings of this study to make informed decisions about offering online courses.

Educational institutions can offer more online sections of courses and degree programs in the content areas that students prefer to take online. They can similarly plan to offer more courses and programs face to face in those subject areas that students reportedly prefer to take in traditional classroom settings. Such informed planning of course and program offerings will help educational institutions better meet the needs of their students.

This study seeks to answer the following four research questions:

1. What is the relationship between the content area of the course and students' preferences for taking the course fully online, partially online or completely face to face?
2. What is the relationship between students' ethnicity and preference for taking courses in different content areas fully online, partially online or completely face to face?
3. What is the relationship between students' sex and preference for taking courses in different content areas fully online, partially online or completely face to face?
4. What is the relationship between students' prior experience or lack thereof with online courses and preference for taking courses in different content areas fully online, partially online or completely face to face?

Methods

Data Collection

A survey was developed, and administered to 113 students who were enrolled undergraduate and graduate courses in a large, publicly funded research university that is located in the southeastern part of the United States of America. The survey instrument was first pilot tested with students in a graduate level educational research course. The students in the graduate course were asked to complete the survey and identify potential problems in the survey. The survey was modified based on the feedback provided by these students before it was administered to the larger group

of 113 participants. Students who participated in the pilot phase of the study were not included in the larger study.

The names of courses included in the survey, in order to determine students' preferences for taking them fully online, partially online or face to face, were taken directly from the undergraduate catalog of the university where the study was conducted.

Approval to conduct research involving human subjects was obtained from the Institutional Review Board (IRB) at the university. The survey was administered in classes taught at the university. Faculty who taught undergraduate and graduate courses, were contacted and permission requested to administer the survey to their students during class time. The surveys were then administered to students enrolled in those classes for which instructors granted permission to the researchers to collect data. A verbal consent statement that was approved by the IRB was read before the start of each data collection session. The participants were not compensated or rewarded in any way by the researchers.

Description of the Sample

More than sixty-seven percent of the study participants were females (67.3%), while 32.7% of the subjects were males. Of the 113 students who participated in the study, 37 were males and 76 were females.

Sixty-seven percent of those who participated in the study were of Hispanic origin, as shown in Table 1. This is not surprising because the university in which the study was conducted is considered to be a "Hispanic Serving Institution" according to Federal Government guidelines. Almost all Latin American countries are represented in the student body, and the diversity of students enrolled in courses and programs in the university can be attributed to the ethnic diversity that exists in the large city in which the university is located.

Table 1
Distribution of the sample of participants by ethnicity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Asian	5	4.4	4.5	4.5
	Black or African American	16	14.2	14.3	18.8
	Hispanic	75	66.4	67.0	85.7
	White	16	14.2	14.3	100.0
	Total	112	99.1	100.0	
Missing	System	1	.9		
Total		113	100.0		

The sample also consisted of 39 or 35.8% of students who had not taken any courses online and 70 or 64.2% percent of students who had taken one or more courses online. Data, as shown in Table 2, were missing for four students (3.5%).

Table 2
Distribution of the sample by number of online classes completed

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	39	34.5	35.8	35.8
	1	70	61.9	64.2	100.0
	Total	109	96.5	100.0	
Missing	System	4	3.5		
Total		113	100.0		

Data Analysis, Findings, and Discussion of Findings

A majority of students who participated in this study were of Hispanic origin. The numbers of Caucasian and African American students who participated in the study were comparatively smaller. Therefore, it should be acknowledged at the outset that the findings of this study could be limited to the population of Hispanic students and the results may or may not be generalizable to the entire population of college and university students.

The findings of this study are many and they will be described and discussed while answering each of the four research questions previously mentioned. Some of the findings may have to be accepted with caution especially in instances where the expected cell count is less than five.

1. *Is there a relationship between the content area of the course and students' preferences for taking the course fully online, partially online or completely face to face?*

   The answer to the above research question is a resounding "yes." There is certainly a relationship between the content areas of the courses and preferences for taking the courses. Frequencies were initially obtained to determine the numbers and percentages of students who prefer taking certain content courses fully online, partially online, or in the traditional face to face format. An overwhelming majority of more than 80% of the students who participated in this survey indicated (see Table 3) that they prefer to take calculus (n=99, 87.6%), statistics (n=93, 82.3%), trigonometry (n=93, 82.3%), and physics (n=92, 81.4%) courses in face to face settings.

   Between 75.2% and 79.6% of the students reported (see Table 4) that they prefer to take courses in content areas such as accounting (n=90, 79.6%), finite math (n=89, 78.8%), chemistry (n=87, 77.0%), and finance (n=85, 75.2%) in face to face settings. A majority of the students also preferred to take biology (n=77, 68.1%), economics (n=71, 62.8%), and performing arts (n=70, 61.9%) courses in traditional face to face settings as well.

   Other content area courses that were considered suitable for online delivery modes were marketing (n=55, 48.7%), fine arts (n=54,47.8%), anthropology (n=52, 46.0%), English Composition (n=48, 42.5%), politics (n=46, 40.7%), psychology (n=46, 40.7%), art history (n=45, 39.8%), computer science (n=44, 38.9%), geography (n=44, 38.9%) and human growth and development (n=43, 38.1%), as shown in table 5.

Table 3
Content area courses that more than eighty percent of the students prefer to take face to face

Course Taking Preference	Course Content Areas (Sample Size: N =113)				
	Accounting	Calculus	Physics	Statistics	Trigonometry
Fully Online	11 (9.8%)	5 (4.5%)	10 (8.8%)	7 (6.3%)	9 (8.0%)
Partially Online	11 (9.8%)	8 (7.1%)	11 (9.7%)	12 (10.7%)	10 (8.9%)
Face to face	90 (80.4%)	99 (88.4%)	92 (81.4%)	93 (83.0%)	93 (83.0%)
Missing Data	1	1	0	1	1

Table 4
Content area courses that between seventy and seventy nine percent of the students prefer to take face to face

Course Taking Preference	Course Content Areas (Sample Size: N =113)		
	Chemistry	Finance	Finite Math
Fully Online	8 (7.2%)	11 (9.8%)	9 (8.0%)
Partially Online	16 (14.4%)	16 (14.3%)	14 (12.5%)
Face to face	87 (78.4%)	85 (75.9%)	89 (79.5%)
Missing Data	2	1	1

Table 5
Content area courses that between sixty and sixty nine percent of the students prefer to take face to face

Course Taking Preference	Course Content Areas (Sample Size: N =113)		
	Biology	Economics	Performing Arts
Fully Online	19 (17.0%)	17 (15.0%)	21 (19.3%)
Partially Online	16 (14.3%)	25 (22.1%)	18 (16.5%)
Face to face	77 (68.7%)	71 (62.8%)	70 (64.2%)
Missing Data	1	0	4

Table 6
Other content area courses that students prefer to take face to face

Course Taking Preference	Course Content Areas (Sample Size: N =113)				
	Anthropology	Computer Science	English Composition	Fine Arts	Geography
Fully Online	32 (28.8%)	27 (24.3%)	38 (33.9%)	37 (32.7%)	38 (34.5%)
Partially Online	27 (24.3%)	40 (36.0%)	26 (23.2%)	22 (19.5%)	28 (25.5%)
Face to face	52 (46/.8%)	44 (39.6%)	48 (42.9%)	54 (47.8%)	44 (50.0%)
Missing Data	2	2	1	0	3

The data collected for this study shows that relatively smaller majorities of students (see Table 6) reportedly preferred to take courses in civilization (n=50, 44.2%), earth science (n=40, 35.4%), history (n=41, 36.3%), religion (n=41, 36.3%), and sociology (n=43, 38.1%) fully online.

It has been widely reported that students have "math anxiety" (Betz, 1978; Perry, 2004; Tobias, 1993), "science anxiety" (Brownlow, Jacobi, and Rogers, 2000; Mallow, 1994; Mallow, Jeffry, Kastrup, Helge, Bryant, Fred B., Hislop, Nelda, Shefner, Rachel, and Udo, Maria, 2010; and Udo, Ramsey, and Mallow, 2004), and such anxiety could make them avoid taking courses in these content areas. Another well researched topic is "computer anxiety" (Anderson, 1996; Beckers and Schmidt, 2001; Chua, Chen, and Wong, 1999; and Igbaria, and Chakrabarti, 1990). The prevalence of "statistics anxiety" has also been reported in the literature (Zeidner, 1991).

Based on the data obtained for this study, and keeping the literature on computers, math, science and statistics anxieties in mind, it can be construed that students reportedly preferred to take courses that contain science and /or math content in traditional classroom settings rather than at a distance. The data can also be interpreted to suggest that students reportedly preferred subject area courses that are generally considered to be difficult, such as calculus, physics, chemistry trigonometry, accounting, finite math, and finance, to be offered in face to face settings.

2. *What is the relationship between students' ethnicity and preference for taking courses in different content areas fully online, partially online or completely face to face?*

   Results of cross tabulations and Chi-Square tests showed that there were no significant differences at the p= <= .05 level between students' ethnicity and their preferences for taking courses online, face-to face or partially online.

   There were significant differences in two content area courses at probability levels that were slightly above the threshold level of p <= .05 that was previously determined as being the acceptable threshold for determining if differences were statistically significant. These two course content areas were Earth Science, Chi-Square 5.385, df = 2, 2-sided significance p = .068, and Human Growth & Development, Chi-Square 5.135, df = 2, 2-sided significance p = .077. In both instances, greater proportions of Hispanic students preferred to take the courses fully online.

3. *Is there a relationship between students' sex and preference for taking courses in different content areas fully online, partially online or completely face to face?*

   Sex related differences in course taking preferences were observed in the five content areas of art history, fine arts, marketing, performing arts and psychology. Results of cross tabulations shown in Tables 7, 8, 9, 10, and 11 provide evidence regarding differences in course taking preferences between males and females.

   Data in Table 7 shows that a large proportion of females reportedly preferred to take art history courses in face to face settings. A smaller proportion of females reportedly preferred to take the course partially online. Similar results were obtained in the content areas of fine arts, marketing, and performing arts. In the content area of psychology, larger proportions of female students reportedly preferred to take the course partially online, while a smaller proportion preferred to take the course face to face. These findings are shown in Tables 8, 9, 10, and 11.

Table 7
Crosstab and Pearson Chi Square: Sex by course taking preference – Art History

Sex	Counts	Course Content Area: Art History			Total
		Fully Online	Partially Online	Face to Face	
Male	Count	21	4	11	36
	Expected Count	14.3	7.1	14.6	36.0
	% of Total	18.9%	3.6%	9.9%	32.4%
Female	Count	23	18	34	75
	Expected Count	29.7	14.9	30.4	75.0
	% of Total	20.7%	16.2%	30.6%	67.6%
Total	Count	44	22	45	111
	Expected Count	44.0	22.0	45.0	111.0
	% of Total	39.6%	19.8%	40.5%	100%

Pearson Chi Square value = 8.046, df = 2, p = .018 (2-sided significance)

Students' gender does seem to play a role in their course taking preferences in different content areas. The findings of this study are somewhat consistent with Wang and Jong's (2008) assertion that the women enrolled in computer literacy courses who participated in their study did not prefer distance education courses. However, Sullivan (2001) has found that online education does benefit female students who are older. This study found that there were differences between men and women in their course taking preferences in five content areas, none of which were computer literacy courses. Such differences in preferences could also exist in other content area courses that were not included in this study.

Table 8
Crosstab and Pearson Chi Square: Sex by course taking preference – Fine Arts

Sex	Counts	Course Content Area: Fine Arts			Total
		Fully Online	Partially Online	Face to Face	
Male	Count	19	6	12	37
	Expected Count	12.1	7.2	17.7	37.0
	% of Total	16.8%	5.3%	10.8%	32.7%
Female	Count	18	16	42	76
	Expected Count	24.9	14.8	36.3	76.0
	% of Total	15.9%	14.2%	37.2%	67.3%
Total	Count	37	22	54	113
	Expected Count	37.0	22.0	54.0	113.0
	% of Total	32.7%	19.5%	47.8%	100%

Pearson Chi Square value = 8.831, df = 2, p = .012 (2-sided significance)

Table 9
Crosstab and Pearson Chi Square: Sex by course taking preference – Marketing

Sex	Counts	Course Content Area: Marketing			Total
		Fully Online	Partially Online	Face to Face	
Male	Count	14	8	14	36
	Expected Count	7.8	10.4	17.8	36.0
	% of Total	12.6%	7.2%	12.6%	32.4%
Female	Count	10	24	41	75
	Expected Count	16.2	21.6	37.2	75.0
	% of Total	9.0%	21.6%	36.9%	67.6%
Total	Count	24	32	55	111
	Expected Count	24.0	32.0	55.0	111.0
	% of Total	21.6%	28.8%	49.5%	100.0%

Table 10
Crosstab & Pearson Chi Square: Sex by course taking preference – Performing Arts

Sex	Counts	Course Content Area: Performing Arts			Total
		Fully Online	Partially Online	Face to Face	
Male	Count	13	5	17	35
	Expected Count	6.7	5.8	22.5	35.0
	% of Total	11.9%	4.6%	15.6%	32.1%
Female	Count	8	13	53	74
	Expected Count	14.3	12.2	47.5	74.0
	% of Total	7.3%	11.9%	48.6%	67.9%
Total	Count	21	18	70	109
	Expected Count	21.0	18.0	70.0	109.0
	% of Total	19.3%	16.5%	64.2%	100.0%

Pearson Chi Square value = 10.672, df = 2, p = .005 (2-sided significance)

Table 11
Crosstab and Pearson Chi Square: Sex by course taking preference – Psychology

Sex	Counts	Course Content Area: Psychology			Total
		Fully Online	Partially Online	Face to Face	
Male	Count	17	6	14	37
	Expected Count	9.3	12.6	15.2	37.0
	% of Total	15.2%	5.4%	12.5%	33.0%
Female	Count	11	32	32	75
	Expected Count	18.8	25.4	30.8	75.0
	% of Total	9.8%	28.6%	28.6%	67.0%
Total	Count	28	38	46	113
	Expected Count	28.0	38.0	46.0	112.0
	% of Total	25.0%	33.9%	41.1%	100%

Pearson Chi Square value = 14.946, df = 2, p = .001 (2-sided significance)

4. *What is the relationship between students' prior experience or lack thereof with online courses and preference for taking courses in different content areas fully online, partially online or completely face to face?*

   Previous research has shown that students who have prior experience with the technology are likely to be successful in online education (Harris and Gibson, 2006; Kishore, Tabrizi, Ozan, Aziz, and Wuensch, 2009; and Volery, 2001). Prior knowledge of the course content material has also been shown to be positively linked to online course taking decisions (Tabatabaei, Manouchehr, Schrottner, Bea, and Reichgelt, Han. (2006)).

   Students who had prior online course taking experience reported that they would take courses in the ten content areas of civilization, earth science, English composition, fine arts, geography, human growth & development, marketing, psychology, religion, and sociology fully online. These are typically courses in which not much mathematics content is covered. This could be a reason why students who have taken one or more online courses reportedly preferred to take these courses online. Data for the civilization course is shown in Table 12. Data tables 17-25 for the courses earth science, English composition, fine arts, geography, human growth & development, marketing, psychology, religion, and sociology, are shown in Appendix A.

   In the case of biology, it is clear that a significantly large proportion of students preferred to take the course partially online. This is shown in Table 13. The rest of the students were divided in their course taking preference, with a slightly larger proportion of students reporting that they preferred to take biology courses face to face than fully online. It can be interpreted that a statistically significant proportion of the students preferred to take biology courses partially online, the second choice being taking the course face to face. The last choice was taking the course fully online. A biology course is also a science course. However, more students typically pass biology courses at higher rates than students who pass courses in chemistry and physics. For example, Abudayyeh (2008) reports that at the Massachusetts Institute of Technology (MIT)

   The Class of 2012's performance on the advanced standing exams (ASEs) was markedly different from last year's as freshman performed better on the biology exams but poorer on the physics exams.

   . . .

   The chemistry ASE, one of the harder ASEs because of its coverage of topics that extend beyond high school curriculum, again had the lowest passing rate among all the advanced standing exams, as only 7 out of the 100 students who took the exam passed.

The data shows that significantly larger proportions of students preferred to take courses such as chemistry, finance, and statistics in face to face settings. The data for the course content area of chemistry is shown in Table 14. Sizeable, but smaller proportions of students also indicated they would take the courses in partially online formats. The data for courses in the content areas of finance and statistics (Table 26 and Table 27) are shown in Appendix B.

As far as the two content areas of computer science and politics are concerned, significantly greater proportions of students preferred to take the courses partially online, as shown in Table 15 and Table 16. As the data in the two tables show, lesser proportions of students preferred to take the courses fully online.

Table 12
Crosstab and Pearson Chi Square: Number of online courses taken by course taking preference – Civilization

Number of Online Courses Taken	Counts	Course Content Area: Civilization			Total
		Fully Online	Partially Online	Face to Face	
Zero Courses Taken Online	Count	12	10	17	39
	Expected Count	17.3	10.4	11.4	39.0
	% of Total	10.6%	8.8%	15.0%	34.5%
One or More Courses Taken Online	Count	38	20	16	74
	Expected Count	32.7	19.6	21.6	74.0
	% of Total	33.6%	17.7%	14.2%	65.5%
Total	Count	50	30	33	113
	Expected Count	50.0	30.0	33.0	113.0
	% of Total	44.2%	26.5%	29.2%	100.0%

Pearson Chi Square value = 6.684, df = 2, p = .035 (2-sided significance)

Table 13
Crosstab and Pearson Chi Square: Number of online courses taken by course taking preference – Biology

Number of Online Courses Taken	Counts	Course Content Area: Biology			Total
		Fully Online	Partially Online	Face to Face	
Zero Courses Taken Online	Count	5	0	33	38
	Expected Count	6.4	5.4	26.1	38.0
	% of Total	4.5%	0%	29.5%	33.9%
One or More Courses Taken Online	Count	14	16	44	74
	Expected Count	12.6	10.6	50.9	74.0
	% of Total	12.5%	14.3%	39.3%	66.1%
Total	Count	19	16	77	112
	Expected Count	19.0	16.0	77.0	112.0
	% of Total	17.0%	14.3%	68.8%	100%

Pearson Chi Square value = 11.446, df = 2, p = .003 (2-sided significance

Table 14
Crosstab and Pearson Chi Square: Number of online courses taken by course taking preference – Chemistry

Number of Online Courses Taken	Counts	Course Content Area: Chemistry			Total
		Fully Online	Partially Online	Face to Face	
Zero Courses Taken Online	Count	4	0	34	38
	Expected Count	2.7	5.5	29.8	38.0
	% of Total	3.6%	.0%	30.6%	33.9%
One or More Courses Taken Online	Count	4	16	53	74
	Expected Count	5.3	10.5	57.2	74.0
	% of Total	3.6%	14.4%	47.7%	66.1%
Total	Count	8	16	87	112
	Expected Count	8.0	16.0	87.0	112.0
	% of Total	7.2%	14.4%	78.4%	100%

Pearson Chi Square value = 10.120, df = 2, p = .006 (2-sided significance)

Table 15
Crosstab and Pearson Chi Square: Number of online courses taken by course taking preference – Computer Science

Number of Online Courses Taken	Counts	Course Content Area: Computer Science			Total
		Fully Online	Partially Online	Face to Face	
Zero Courses Taken Online	Count	7	9	22	38
	Expected Count	9.2	13.7	15.1	38.0
	% of Total	6.3%	8.1%	19.8%	34.2%
One or More Courses Taken Online	Count	20	31	22	73
	Expected Count	17.8	26.3	28.9	73.0
	% of Total	18.0%	27.9%	19.8%	65.8%
Total	Count	27	40	44	111
	Expected Count	27.0	40.0	44.0	111.0
	% of Total	24.3%	36.0%	39.6%	100.0%

Pearson Chi Square value = 8.132, df = 2, p = .017 (2-sided significance)

Table 16
Crosstab and Pearson Chi Square: Number of online courses taken by course taking preference – Politics

Number of Online Courses Taken	Counts	Course Content Area: Politics			Total
		Fully Online	Partially Online	Face to Face	
Zero Courses Taken Online	Count	8	8	22	38
	Expected Count	10.2	12.2	15.6	38.0
	% of Total	7.1%	7.1%	19.6%	33.9%
One or More Courses Taken Online	Count	22	28	24	74
	Expected Count	19.8	23.8	30.4	74.0
	% of Total	19.6%	25.0%	21.4%	66.1%
Total	Count	30	36	46	112
	Expected Count	30.0	36.0	46.0	112.0
	% of Total	26.8%	32.1%	41.1%	100.0%

Pearson Chi Square value = 6.870, df = 2, p = .032 (2-sided significance)

In the case of the content area of trigonometry, the Chi Square value of 5.971 was significant at the p=.051 level, which is just above the threshold level of p=.05 that was considered the cutoff point for purposes of this study. An overwhelmingly large proportion of students reported that they preferred to take trigonometry courses the traditional, face to face way.

Conclusion

The study found that there are differences between males and females in terms of the courses that they prefer to take online. Similar studies should be conducted to replicate the findings of this study using a larger number of courses. Future studies can also focus on different content courses within the same broad subject area. For example, future studies can look for differences in course taking preferences in the different areas of mathematics, by including courses such as algebra, geometry, calculus, and trigonometry and courses in other topic areas that fall under the broad umbrella of mathematics.

Results of this study have also shown that there are indeed significant differences is course taking preferences between students who have prior experience with online courses, and have taken at least one or more courses online, and those who have not taken any courses online. In many instances, it is true that prior experience is a predictor of future experience and success. Distance learning is no exception.

This study has certainly added to a relatively sparse knowledge base regarding online course taking preferences of students in different content areas. The findings of this study also have policy implications for colleges and universities. Educational institutions offering distance education courses can develop policies and procedures to screen students who wish to take online courses based on their subject area preferences, their prior online course-taking experience, and other factors that have been reported by other researchers, such as maturity and self-efficacy, to name two.

The findings of this study, which need to be replicated, using broader and larger samples of participants drawn from diverse ethnic backgrounds, varying age levels, different educational levels, and different cultures, can provide a basis for colleges and universities to better meet the online learning needs of its students, and at the same time also make more efficient and effective uses of ever shrinking resources.

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Appendix A

Data tables for courses that students reportedly prefer to complete fully online.

Table 17
Crosstab and Pearson Chi Square: Number of online courses taken by course taking preference – Earth Science

Number of Online Courses Taken	Counts	Course Content Area: Earth Science			Total
		Fully Online	Partially Online	Face to Face	
Zero Courses Taken Online	Count	9	8	22	39
	Expected Count	13.9	12.5	12.5	39.0
	% of Total	8.0%	7.1%	19.6%	34.8%
One or More Courses Taken Online	Count	31	28	14	73
	Expected Count	26.1	23.5	23.5	73.0
	% of Total	27.7%	25.0%	12.5%	65.2%
Total	Count	40	36	36	112
	Expected Count	40.0	36.0	36.0	112.0
	% of Total	35.7%	32.1%	32.1%	100.0%

Pearson Chi Square value =16.156, df = 2, p = .000 (2-sided significance)

Table 18
Crosstab and Pearson Chi Square: Number of online courses taken by course taking preference – English Composition

Number of Online Courses Taken	Counts	Course Content Area: English Composition			Total
		Fully Online	Partially Online	Face to Face	
Zero Courses Taken Online	Count	5	10	24	39
	Expected Count	13.2	9.1	16.7	39.0
	% of Total	4.5%	8.9%	21.4%	34.8%
One or More Courses Taken Online	Count	33	16	24	73
	Expected Count	24.8	16.9	31.3	73.0
	% of Total	29.5%	14.3%	21.4%	65.2%
Total	Count	38	26	48	112
	Expected Count	38.0	26.0	48.0	112.0
	% of Total	33.9%	23.2%	42.9%	100.0%

Pearson Chi Square value = 12.882, df = 2, p = .002 (2-sided significance)

Appendix A (Continued)

Data tables for courses that students reportedly prefer to complete fully online.

Table 19
Crosstab and Pearson Chi Square: Sex by course taking preference – Fine Arts

Sex	Counts	Course Content Area: Fine Arts			Total
		Fully Online	Partially Online	Face to Face	
Male	Count	19	6	12	37
	Expected Count	12.1	7.2	17.7	37.0
	% of Total	16.8%	5.3%	10.8%	32.7%
Female	Count	18	16	42	76
	Expected Count	24.9	14.8	36.3	76.0
	% of Total	15.9%	14.2%	37.2%	67.3%
Total	Count	37	22	54	113
	Expected Count	37.0	22.0	54.0	113.0
	% of Total	32.7%	19.5%	47.8%	100%

Pearson Chi Square value = 8.831, df = 2, p = .012 (2-sided significance)

Table 20
Crosstab and Pearson Chi Square: Number of online courses taken by course taking preference – Geography

Number of Online Courses Taken	Counts	Course Content Area: Geography			Total
		Fully Online	Partially Online	Face to Face	
Zero Courses Taken Online	Count	7	10	20	37
	Expected Count	12.8	9.4	14.8	37.0
	% of Total	6.4%	9.1%	18.2%	33.6%
One or More Courses Taken Online	Count	31	18	24	73
	Expected Count	25.2	18.6	29.2	73.0
	% of Total	28.2%	16.4%	21.8%	66.4%
Total	Count	38	28	44	110
	Expected Count	38.0	28.0	44.0	110.0
	% of Total	34.5%	25.5%	40.0%	100.0%

Pearson Chi Square value = 6.748, df = 2, p = .034 (2-sided significance)

Appendix A (Continued)

Data tables for courses that students reportedly prefer to complete fully online.

Table 21
Crosstab and Pearson Chi Square: Number of online courses taken by course taking preference – Human Growth & Development

Number of Online Courses Taken	Counts	Course Content Area: Human Growth & Development			Total
		Fully Online	Partially Online	Face to Face	
Zero Courses Taken Online	Count	7	8	23	38
	Expected Count	12.6	10.9	14.6	38.0
	% of Total	6.3%	7.1%	20.5%	33.9%
One or More Courses Taken Online	Count	30	24	20	74
	Expected Count	24.4	21.1	28.4	74.0
	% of Total	26.8%	21.4%	17.9%	66.1%
Total	Count	37	32	43	112
	Expected Count	37.0	32.0	43.0	112.0
	% of Total	33.0%	28.6%	38.4%	100.0%

Pearson Chi Square value = 12.195, df = 2, p = .002 (2-sided significance)

Table 22
Crosstab and Pearson Chi Square: Sex by course taking preference – Marketing

Sex	Counts	Course Content Area: Marketing			Total
		Fully Online	Partially Online	Face to Face	
Male	Count	14	8	14	36
	Expected Count	7.8	10.4	17.8	36.0
	% of Total	12.6%	7.2%	12.6%	32.4%
Female	Count	10	24	41	75
	Expected Count	16.2	21.6	37.2	75.0
	% of Total	9.0%	21.6%	36.9%	67.6%
Total	Count	24	32	55	111
	Expected Count	24.0	32.0	55.0	111.0
	% of Total	21.6%	28.8%	49.5%	100.0%

Pearson Chi Square value = 9.376, df = 2, p = .009 (2-sided significance)

Appendix A (Continued)

Data tables for courses that students reportedly prefer to complete fully online.

Table 23
Crosstab and Pearson Chi Square: Number of online courses taken by course taking preference – Psychology

Number of Online Courses Taken	Counts	Course Content Area: Psychology			Total
		Fully Online	Partially Online	Face to Face	
Zero Courses Taken Online	Count	5	11	22	38
	Expected Count	9.5	12.9	15.6	38.0
	% of Total	4.5%	9.8%	19.6%	33.9%
One or More Courses Taken Online	Count	23	27	24	74
	Expected Count	18.5	25.1	30.4	74.0
	% of Total	20.5%	24.1%	21.4%	66.1%
Total	Count	28	38	46	112
	Expected Count	28.0	38.0	46.0	112.0
	% of Total	25.0%	33.9%	41.1%	100.0%

Pearson Chi Square value = 7.610, df = 2, p = .022 (2-sided significance)

Table 24
Crosstab and Pearson Chi Square: Number of online courses taken by course taking preference – Religion

Number of Online Courses Taken	Counts	Course Content Area: Religion			Total
		Fully Online	Partially Online	Face to Face	
Zero Courses Taken Online	Count	11	7	21	39
	Expected Count	14.5	11.3	13.1	39.0
	% of Total	10.0%	6.4%	19.1%	35.5%
One or More Courses Taken Online	Count	30	25	16	71
	Expected Count	26.5	20.7	23.9	71.0
	% of Total	27.3%	22.7%	14.5%	64.5%
Total	Count	41	32	37	110
	Expected Count	41.0	32.0	37.0	110.0
	% of Total	37.3%	29.1%	33.6%	100.0%

Pearson Chi Square value = 11.248, df = 2, p = .004 (2-sided significance)

Appendix A (Continued)

Data tables for courses that students reportedly prefer to complete fully online.

Table 25
Crosstab and Pearson Chi Square: Number of online courses taken by course taking preference – Sociology

Number of Online Courses Taken	Counts	Course Content Area: Sociology			Total
		Fully Online	Partially Online	Face to Face	
Zero Courses Taken Online	Count	9	10	20	39
	Expected Count	15.2	10.6	13.1	39.0
	% of Total	8.2%	9.1%	18.2%	35.5%
One or More Courses Taken Online	Count	34	20	17	71
	Expected Count	27.8	19.4	23.9	71.0
	% of Total	30.9%	18.2%	15.5%	64.5%
Total	Count	43	30	37	110
	Expected Count	43.0	30.0	37.0	110.0
	% of Total	30.1%	27.3%	33.6%	100.0%

Pearson Chi Square value = 9.616, df = 2, p = .008 (2-sided significance)

Appendix B

Data tables for courses that students reportedly prefer to complete fully online.

Table 26
Crosstab and Pearson Chi Square: Number of online courses taken by course taking preference – Finance

Number of Online Courses Taken	Counts	Course Content Area: Finance			Total
		Fully Online	Partially Online	Face to Face	
Zero Courses Taken Online	Count	5	1	33	39
	Expected Count	3.8	5.6	29.6	39.0
	% of Total	4.5%	0.9%	29.5%	34.8%
One or More Courses Taken Online	Count	6	15	52	73
	Expected Count	7.2	10.4	55.4	73.0
	% of Total	5.4%	13.4%	46.4%	65.2%
Total	Count	11	16	85	112
	Expected Count	11.0	16.0	85.0	112.0
	% of Total	9.8%	14.3%	75.9%	100%

Pearson Chi Square value = 6.903, df = 2, p = .032 (2-sided significance)

Table 27
Crosstab and Pearson Chi Square: Number of online courses taken by course taking preference – Statistics

Number of Online Courses Taken	Counts	Course Content Area: Statistics			Total
		Fully Online	Partially Online	Face to Face	
Zero Courses Taken Online	Count	1	0	38	39
	Expected Count	2.4	4.2	32.4	39.0
	% of Total	0.9%	0%	33.9%	34.8%
One or More Courses Taken Online	Count	6	12	55	73
	Expected Count	4.6	7.8	60.6	73.0
	% of Total	5.4%	10.7%	49.1%	65.2%
Total	Count	7	12	93	112
	Expected Count	7.0	12.0	93.0	112.0
	% of Total	6.3%	10.7%	83.0%	100.0%

Pearson Chi Square value = 9.206, df = 2, p = .010 (2-sided significance)

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Editor's Note. The research conclusions give cause for reflection. Where is a teacher more effective than a computer? And where is a computer likely to be more successful? Each have their own particular values, and teachers, even students, may have the option to choose. This study suggests we need to reconsider what is the most effective feedback to support learning.

Computer–Based Feedback vs. Instructor– Provided Feedback and Second Language Learners' Reading Comprehension

Malahat Yousefzadeh
Iran

Abstract

This study investigated the effects of computer-based feedback and paper-based (teacher-provided) feedback with multiple-choice questions on English reading comprehension scores. The purpose of this study is to assess the potential of computer-based feedback for improving second language reading comprehension. Thus, our goal is to investigate whether computer-based feedback has an advantage for the reading comprehension of second language by elementary Iranian learners. Eighty participants were divided into two groups: a computer-based group and a teacher-based group. The proficiency test confirmed that there was no significant difference between two groups. The same reading comprehension tests were administered on both groups during treatments and final tests. Results indicated that students who received the computer-based feedback improved their reading comprehension significantly compared to their peers who received paper-based (teacher-provided) feedback.

Introduction

One of the challenges for assessment of today's education is that students are expecting better, more frequent, and quicker feedback. Research on how students perceive feedback, and what aspects of feedback are most valued by students, is providing insight into how best to provide feedback to maximize its usefulness in evaluation and in transforming learning. (Orsmond, Merry, & Reiling, 2005; Peat & Franklin, 2002).

For feedback to be most effective, it should be appropriate and timely (Ramsden, 1992). In the context of feedback on assessment tasks, this means within a timeframe that allows students to recall their responses and the understanding that informed their decisions. Shute (2008) defined feedback as the information communicated to the learner to modify his or her thinking or behavior for the purpose of improving learning, and then agreed that providing students with timely feedback is important.

Now, with our electronic age, most feedback is converted to digital and online environments. Mory (2003) said the feedback mechanisms that are used by students have changed with the advances and growth of web-based learning systems. Although most teachers throughout the world, and especially in our country, still use chalk and blackboard and paper/pencil, the computer is used routinely in language instruction, in highly developed countries, to provide supplementary practice in four skills. There is growing increase in the use of computers for assessment purposes within higher educational institutions globally (Sim, Holifield, & Brown, 2004). As Al-Segheyer (2001) says: "in the realm of second language acquisition, the most recent effort to enhance the process of language learning has involved computer technology which is referred to as "CALL:" (Computer-Assisted Language Learning).

Compared to a traditional textbook or workbook, a CALL program can provide immediate feedback on the correctness of the learner's response. In web-based learning systems feedback presented by computer is usually aimed to replace feedback given to the student by the teacher

and to improve student performance (Mory, 2003). Despite the fact that models and guidelines recommending pedagogically sound practices for incorporating Internet-based materials exist (Brandl, 2002; Chun & Plass, 2000 cited in Murphy, 2007), a major concern is that the number of such examples remains limited.

Likewise, guidelines for offering a reading course via the Internet (Caverly & McConald, 1998; Jones & Wolf, 2001; Mikulecky, 1998 cited in Murphy, 2007) are similarly few. However, evidence exists to support the assumption that integrating reading with computer-mediated support improves ESL students' reading skills (Chun & Plass, 1996; Hong, 1997; Stakhnevich, 2002; Williams & Williams, 2000 cited in Murphy, 2007).

Reading comprehension exercises have always been neglected by both teachers and learners. The teachers think that grammar, speaking and listening are much more important and students find reading comprehension test boring.

There is general agreement that reading is essential to success in our society. The National Research Council (1998; 17) states that "reading is essential to success in our society". The ability to read is highly valued and important for social and economic advancement (Snow, Burns & Griffin, 1998). Computer-Assisted Instruction (CAI) is among the range of strategies being used to improve student achievement in school subjects, including reading. However, readers and printed texts cannot literally interact, printed text cannot respond to a reader, nor do printed texts invite modification by a reader. Electronic texts, on the other hand can effect a literal interaction between texts and readers (Daniel & Reinking, 1987).

Computer- Mediated Feedback

Clariana (2000), who published extensively on the topics of computer-mediated feedback, provides a succinct summary of the traditionally investigated types of feedback in CALL: Knowledge of response (KR) that states "right" or "wrong" which replicates traditional paper-based answer sheets by providing correct answers; Knowledge of correct response

(KCR) that states or indicates the correct response; and Elaborative feedback that includes several more complex formed of feedback that explain, direct, or monitors (Smith, 1988 cited in Clariaina, 1990). Answer-Until-Correct (AUC, Pressey, 1926) is a common form of elaborative feedback where the learner is directed to respond until correct.

Answer until correct feedback also known as multiple try feedback (MFT). MFT requires students to make multiple tries at answering the same item if and with the added knowledge that their previous or initial response was incorrect.

Using the Answer-Until-Correct Methodology

To gain a picture of readers' understanding of a text researchers and instructors measures comprehension after the reading is complete, and some of the most widely used comprehension assessment measures are multiple choice questions, written recalls, close tests, sentence completion, and open ended questions. The most common comprehension tests is multiple-choice questions.

While most multiple-choice testing requires test takers to select one answer and move on to the next question, the answer-until-correct method forces learners to select answer choices until the correct answer is chosen. This method can provide learners with greater score when they utilize fewer guesses, (for example, learners can get full score for correct first choices, 75% score for second choices, 50% score for third choices, and so forth).

The Previous Study

Many studies found significant differences between computer-administered testing and traditional paper and pencil testing. These studies and articles attributed achievement differences to several factors. Russell and Haney (1996) found significant differences in the performance of students on the National Assessment of Educational Progress computerized tests when compared to traditional paper and pencil tests. They compared 42 students tested on a computer-administered test with scores of 47 students tested on a traditional paper and pencil test. Examinations of learning or comprehension, measured in terms of correct answers, have tended not to find differences between materials presented in the two forms (e. g. Mason et al. 2001, Mayes et al. 2001, Noyes and Garland 2003, Bodmann and Robinson 2004, Garland and Noyes 2004).

The Present Study

The present study is an attempt to investigate the effects of computer-based vs. paper-based (instructor-provided) feedbacks on the reading performance of second language students. The results of this study will be of crucial importance in EFL teaching by equipping teachers and students with computer-based feedback knowledge to promote learning process.

The research was designed to answer the following question:

RQ: What are the effects of computer-based feedback vs. paper-based (instructor-provided) feedbacks on the reading performance of second language learners?

Participants

The participants were 80 third-year high school students in Ardabil. All of the students in this study were females. Students were selected for participation in the program based on the recommendations of their school' counselors and teachers. They had the option not to participate. These participants were then randomly assigned either to the computer-based group or to the traditional paper-based group. The high school was located in an inner city region of Ardabil and was equipped with 30 computers. The majority of students were from middle class families.

Materials

In order to accomplish the purpose of the research, the following tests were administrated:

Proficiency Test

The test focuses primarily on grammar as the clearest indicator of a student's ability in the language.

Reading Comprehension Tests

On the basis of readability index, 8 reading passages were retrieved from www. Mr.nussban.com, each with 7 to 10 questions for elementary level. (Note Appendix B).

These reading comprehension tests were chosen because of the quality of the questions and related text passages, the quality of their distracters, the familiarity of the tests to the subjects and the researchers, the motivational potential of the reading text for subjects, the availability of the materials, and the assumed appropriate reading level of the materials.

Final Tests

To investigate the effects of computer-based and paper-based feedback on reading comprehension, the final tests were administered.

Readability of Reading Passage

Microsoft Word was used to display information about the reading level of the reading passage. Readability of the passage was administered in order to be able to determine the appropriate

readability of the passage for the elementary level. The readabilities within the ranges of 60-70 were considered as appropriate for the participants on the basis of the readability level of their English book.

Computer

Twenty computers were used in this study to administer the online tests.

Procedure

At the beginning of the study, since the students could not be assumed to be at the same proficiency level in English, the subjects were required to take Longman Placement Test (Dawson, 2005). The treatment sessions took 30 minutes and were held twice a week. To avoid the possibility of environmental differences in testing conditions, the same room was used to administer both computer-based and paper-based tests.

Treatment Tests

Paper-Based (Teacher-Provided) Test

Students read each question and then wrote the letter (A, B, C or D) of the answer choice on a separate sheet. Allocated time for completing test and receiving feedback is 30 minutes. In tradition paper-based tests of reading comprehension typically students answer multiple-choice questions after they have read a passage and answers were recorded with a pencil on the answer sheet. Feedback was given promptly by providing answer keys or reviewing the examination immediately after completion of the examination. Then the students checked their answers to the test with answer keys provided by teacher. The allocated sessions for treatment were 7 days.

Computer-Based (On Line) Test

A thirty minute training session was held prior to the main research to familiarize this group with the process of taking computer-based tests. Since the number of participants was twice the number of the computers, the computer-based group was divided into two groups. Every session 20 participants were gathered in the computer laboratory to take a computerized reading comprehension test. The format of this type of test was the same as that for a paper-based, multiple-choice test. The differences were that as the students click on an option, feedback was provided automatically. In the computer-based reading questions, students answered all questions by receiving item by item online feedback in the computer. Feedback was delivered during comprehension, item by item, not after the test. In the computer-based test, “answer-until-correct feedback” was utilized. The AUC feedback treatment provided for an incorrect answer, "No, try again" and for the correct answer, "That's correct". This feedback was displayed at the bottom of the screen. After the third try, the learner was told "Right” if correct or "Wrong" if incorrect, and then the student was shown the correct answer by means of an arrow. Students are often correct on the first or second try. This method can provide learners with greater credit when they utilize fewer guesses. For example, learners can full credit for correct first choices, 75% credit for second choices, 50% credit for third choices, and so forth).

Final Tests

After 7 sessions, for investigating the effects of computer-based and paper-based feedback on the comprehension of the texts during treatment tests, all students were given 30 minutes to complete a final comprehension test. This time all students received correct and wrong answers.

Data Analysis

All of the 80 participants were at the elementary level, based on the results of Longman Placement Test administered by the researcher. (See Appendix A) In addition, the homogeneity of participants was determined by calculating the means of two groups. (See Table 4.1).

Table 4.1
Means and Standard Deviations obtained in Proficiency Test

	Proficiency	N	Mean	Standard. Deviation	Std. Error Mean
Score	Group 1	40	60.87	12.68	2.03
	Group 2	40	62.65	11.70	1.82

Group1: Computer-based
Group 2: Teacher-provided

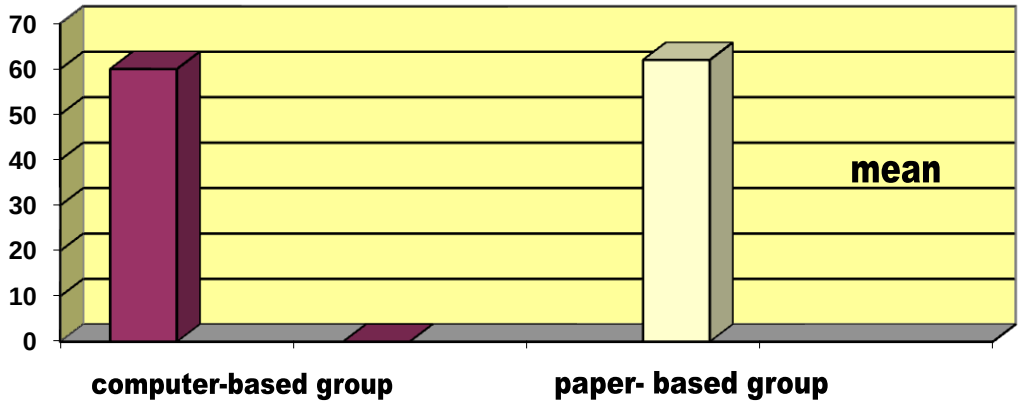

Figure 4.1. Comparison of means obtained in proficiency test by two groups.

As illustrated in Table 4.1 and Figure 4.1, the mean differences indicates that there is no statistically significant difference between proficiency scores of two groups and these groups are homogeneous in terms of language proficiency.

Results obtained by participants in the final test were compared for the traditional paper- based and computer-based feedback in order to determine each of their effects of on reading comprehension outcomes. A t-test was run to test the alternative hypothesis. The data were the scores of two groups after the two types of feedback (computer-based and paper-based).

Table 4.2
Means and Standard Deviation Obtained in Final Tests

	Proficiency	N	Mean	Standard. Deviation	Std. Error Mean
Score	Group 1	40	8.02	1.64	.25
	Group 2	40	5.47	1.24	.19

Table 4.2 shows group statistics. From this we can see that x= 8.02 and SD = 1.64 (computer-based group), and x = 5.47 and SD = 1.24 (teacher-provided group).

Table 4.3
Independent Samples T-Test in final tests

Levene's Test for Equality of Variances					t-test for Equality of Means			
Score	Equal variances not assumed	F	Sig.	t	df	Sig (2-tailed)	Mean Difference	Std. Error Difference
		3.09	.093	7.84	78	.00	2.55	.325
	Equal variances assumed			7.84	72.59	.00	2.55	.320

Table 4.3 indicates the result of the t-test. In this row, we can see that tobs is 7.84 with df = 78. Since the two-tailed significance value of .00 is less than alpha = .05, we can support the alternative hypothesis, that is there is significant difference between the two groups.

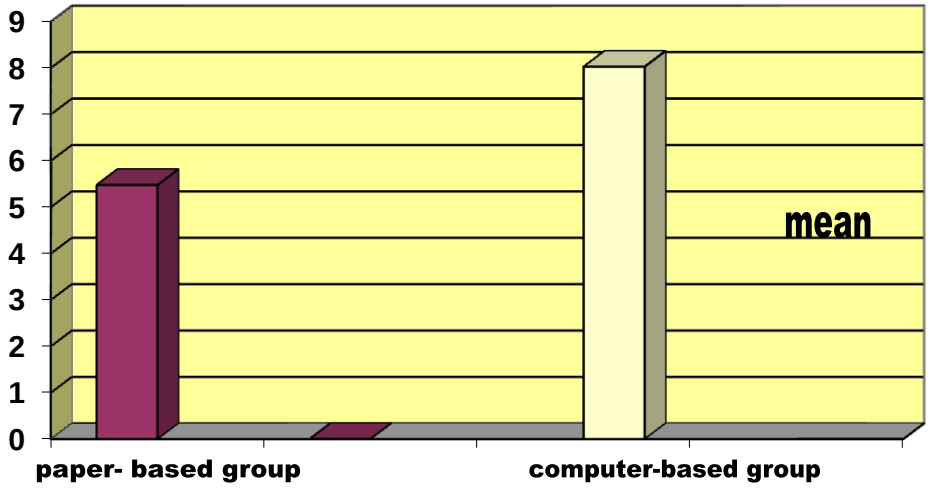

Figure 4.2. Comparison of means obtained in final tests by two groups

The mean differences indicate the magnitude of the difference between the two groups.

Discussion and Result

In contrast to Mory's (1992) research, but consistent with findings by Bangert-Drowns, et al. (1991) and Nagata (1996), a quantitative analysis of the results in this research shows that the main affect of type of feedback was statically significant.

It is clear from these results, therefore, that simply providing students with correct answers to questions in all situations may not necessarily be the most effective way to promote reading comprehension. In this study, the researcher found that feedback can be valuable tool for supporting student learning when used properly. Research stresses the need to provide timely and appropriate feedback that can help a student improve reading comprehension. A computer, which allows instructors to provide immediate feedback in a variety of ways may be used to future enhance instructor's ability to provide useful and timely feedback to students.

The answer-until-correct examination format allows students to re-work or re-think their mistakes, potentially resulting in deeper earning. Students tend to enjoy this examination format, although some students experience anxiety.

Implications

The question is how we can fully utilize the result of this research. Since the invasion of computers into our classroom is an important future trend, we must try to accept and prepare for it. CALL programs present the learner with a novelty. They teach the language in different and more interesting, attractive ways. As a result even tedious drills become more interesting.

Many students need additional time and individualized practice to meet learning objectives. The computer acts as a tutor and guides each learner towards the correct answer while adapting the material to the student's performance. It is clear that detailed, constructive and individualized feedback is an important aspect of good teaching and effective learning. However, providing feedback to students in the traditional form, that is by reading the students' answers, evaluating them, and writing comments can be very time consuming, especially with language classes.

It is impractical for a teacher to write comments for each student. Often with more than thirty pupils in one class, many with different ability levels, this presents the teacher with a constant challenge. Learners receive maximum benefit from feedback only when it is supplied immediately.

The use of computers in the English reading classroom enhanced learning by providing more opportunities for exposure to and use of a variety of learning materials and tasks.

The computer encourages such students to try and become active. There is no time allotted for all the students to read the text, so the students who need more time to read the text can take their time and work at their own pace.

Limitations of the Study

One of the limitations of this study was a small sample size and short duration of the experiment. The impact of feedbacks may not be visible in an eight-day period. Furthermore, 20 computers were not adequate. In order to obtain simple and concise results in this study, the researcher chose to concentrate on the impact of only one variable on L2 reading comprehension (i.e. type of feedback), however other relevant factors might have influenced the result, such as motivation, personality type, and/or previous English experiences.

Suggestions for Further Research

Certain questions remained unanswered with this research: The impact of the computer-based feedback on participants and teachers should be explored. In addition, to maximize the benefits of computer-based feedback, further research needs to be conducted taking another group of participants: larger in size, mixed in gender and at a different study level. Also, there is a very important question that needs to be answered: What effect does computer-based feedback have on reading comprehension for a special population; e.g. disadvantaged students.

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About the Author

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APPENDIX A
Longman Placement Test

Name: _____ Class: _____

Placement 1: Beginner to Elementary

Choose the best option and underline A, B, C or D as in the example 0.

0 A horse has got _____ legs.
A. for B. fore C. fort D. four

1 Hi. What's _____?
A. you name B. your name C. the name D. name

2 Mr. Green is _____ English teacher.
A. our B. us C. we D. you

3 How _____ you today? I'm fine, thanks.
A. are B. is C. be D. am

4 We are _____ the classroom.
A. on B. in C. at D. with

5 _____ are fifteen students in my class.
A. These B. Them C. There D. Their

6 Look at _____ aero plane in the sky! It's very big.
A. these B. their C. it D. that

7 _____ the time? It's five o'clock.
A. What's B. Where's C. When's D. How's

8 Franco comes _____ Costa Rica.
A. for B. in C. at D. from

9 Where do you _____ from? Barcelona or Spain
A. come B. comes C. be D. go

10 Franco _____ like eating breakfast.
A. don't B. doesn't C. aren't D. isn't

11 How _____ is that CD player? – It's $19.50
A. cost B. price C. many D. much

12 Yolanda comes to school _____ train.
A. on B. with C. in D. by

13 _____ you walk to school or take the bus?
A. Are B. Is C. Does D. Do

14 Elephants _____ drink a lot of water every day.
A. must B. need C. was D. has

15 Franco _____ 7 years old in 1999.
A. are B. am C. were D. was

16 Where _____ Carla and Yuri on Saturday afternoon?
A. was B. is C. were D. we're

17 How old _____ you in 2002?
A. are B. have C. were D. had

18 Yuri _____ breakfast at half past eight yesterday morning.
A. has B. have C. were D. had

19	Did you see the news on TV _____ ten o'clock?			
	A.	B.	C.	D.
20	Franco _____ to the cinema after the lesson.			
	A. did go	B. went	C. wanted	D gone
21	Where did you see Titanic? – I _____ it at CineWorld.			
	A. saw	B. see	C. seen	D. look
22	_____ you bring your dictionary yesterday?			
	A. Did	B. Are	C. Was	D. Had
23	I _____ my shoes because they were dirty.			
	A. took	B. took off	C. look out	D. took from
24	Today is _____ than yesterday			
	A. much cold	B. more cold	C. colder	D. cold
25	We don't _____ stay at school after the lesson today.			
	A. must	B. have to	C. ought to	D. should
26	Which book are you __ in the summer.			
	A. read	B. going to read	C. will read	D. have read
27	We _____ go to school yesterday because it was Sunday.			
	A. don't	B. wasn't	C. didn't	D. weren't
28	This book is _____ than that one.			
	A. difficulty	B. much difficult	C. more difficult	D. difficult
29	What _____ you going to do tomorrow evening?			
	A. did	B. was	C. are	D. can
30	_____ Russian? – No, I can't.			
	A. Can you speak	B. You can speak	C. Speak	D. Speak you
31	Do you come from Mexico? – No, I _____. I come from Costa Rica/			
	A. 'm not	B. dont	C. didn't	D. doesn't
32	She _____ television every evening.			
	A.	B.	C.	D.
33	He goes skiing _____ winter			
	A. very	B. ever	C. every	D. always
34	What time do you _____ up on school days?			
	A. used	B. usual	C. use	D. usually
35	The Pyramid of the Sun is _____ Mexico			
	A. from	on	C. in	D. at
36	Are there _____ big sports stadiums near your home?			
	A. any	B. some	C. the	D. a
37	I _____ visit my grandma on Sunday afternoons.			
	A. some time	B. sometimes	C. some	D. sometime
38	_____ the most famous singer in your country.			
	A. Who's	B. Whose	C. How's	D. What's
39	How _____ do you watch a film in English? – Every month.			
	A. often	B. much	C. many	D. every
40	Are you _____ at swimming?			
	A. in	B. for	C. on	D. at

41 Stella's father is a _____. He built my house.
A. build B. building C. builder D. built

42 Is this Stella's hat? _ No, it isn't Stella's, it's _____.
A. me B. I C. My D. mine

43 _____ Language Power book is this? Is it yours?
A. Who's B. Whose C. How's D. Who

44 We _____ the history of Napoleon last year.
A. study B. studying C. studies D. studied

45 _____ about calculus in your Maths class.
A. Had you learn B. Did you learnt C. Was you learn D. Did you learn

46 I _____ this coat at a shop in London last summer.
A. bought B. brought C. buy D. bring

47 The hunter didn't _____ the tiger.
A. B. C. D.

48 How _____ CDs do you buy each year? – About 25, I think.
A. many B. much C. any D. some

49 Ho w _____ sugar do you put in your coffee?
A. many B. much C. any D. some

50 Can you get me a _____ of mineral water, please?
A. bag B. packet C. box D. bottle

51 How much homework _____ to do every weekend?
A. do you have B. are you have C. do you must D. are you must

52 Do you eat ____ fruit?
A. many B. much C. a lot of D. a few

53 _____stand and touch your toes?
A. Can you B. Have you C. Are you D. Able you

54 We can go to school and use the library on Saturday afternoons if you like. But we _____
A. mustn't. B. don't have to. C. can't. D. don't used to.

55 Can you speak _____? I can understand you.
A. slow B. more slowly C. more slow D. slowest

56 _____ , what are you doing?
A. Every day B. At the moment C. Often D. Usually

57 What is Stella _____ today?
A. wear B. wearing C. to wear D. wore

58 The car is driving _____ the tunnel under the Thames.
A. across B. through C. over D. between

59 John is visiting his girlfriend. He always _____ her on Friday evenings
A. visiting B. visits C. visited D. to visit

60 Her mobile phone is _____ than mine.
A. much expensive B. more expensive C. many expensive D. a lot expensive

61 My Mum says my brother's room is _____ than mine.
A. tidy B. tidier C. tidiest D. tidily

62 San Paolo is _____ biggest city in South America.
A. a B. an C. the D. than

63 Don't buy that CD. It's not very good. You _____ enjoy it.
A. will B. can C. won't D. must

64 _____ you ever visit an English speaking country?
A. Was B. Did C. Have D. Are

65 _____ you going to be at home this evening?
A. Was B. Did C. Have D. Are

66 Mrs. Thomas isn't going _____ the health club.
A. join B. to join C. joining D. joined

67 David borrowed some money _____ a car.
A. to buy B. buying C. buy D. going to buy

68 _____ never seen a tornado.
A. I've B. I'm C. I haven't D. I was

69 Leo _____ his girlfriend. She's taking her driving test.
A. have just phone B. has just phoned C. did just phoned D. is just phone

70 Simon has lost _____ mobile phone.
A. he B. its C. his D. their

71 She bought some sandwiches _____ her lunch.
A. from B. for C. to D. in

72 Is Moscow usually warm _____ summer?
A. at B. for C. to D. in

73 (telephone) Hello. _____I speak to Carol Turnbull, please?
A. Can B. Have C. Must D. Am

74 _____ those your new trousers?
A. Is B. Am C. Be D. Are

75 Cities are much _____ than they were in the past.
A. noise B. noisy C. noisier D. noisiest

76 I can't _____ without my glasses.
A. hear B. see C. watch D. look

77 Did you come here _____ car?
A. with your B. on your C. by your D. by

78 You can have either orange juice _____ tomato juice.
A. or B. neither C. nor D. both

79 What's the time? It's half _____ six.
A. before B. to C. after D. past

80 The weather's beautiful today. _____ sunny and warm.
A. There is B. It has C. It's D. Its

[Total 80 marks]

APPENDIX B

Reading Comprehension Tests

BUTTERFLIES

Butterflies are some of the most interesting insects on the planet Earth. There are more than seventeen thousand different kinds of butterflies! Butterflies come in all shapes and sizes

Butterflies go through four main stages of life. The first stage is the egg stage followed by the pupa stage. As a pupa, or caterpillar, the future butterfly eats as much as possible. As it grows, it sheds it outer skin, or exoskeleton. This may happen four or five times. After a few weeks, the caterpillar enters the next stage of its life, the chrysalis stage. In the chrysalis, the caterpillar will liquefy into a soup of living cells. Then, it will reorganize into a butterfly and the metamorphosis is complete. In later parts of the chrysalis stage, you can see the forming butterfly through the chrysalis.

When the butterfly emerges from the chrysalis, it pumps its wings to send blood through them so that it can fly. Most butterflies only live a couple of weeks, just enough time to drink flower nectar and to mate. Some, like the Monarch Butterfly, however, may live many months.

1. Which is true?

    A. There are less than a thousand different kinds of butterflies in the world.
    B. There are about a thousand different kinds of butterflies in the world.
    C. There is only one kind of butterfly in the world.
    D. There are more than a thousand different kinds of butterflies in the world.

2. What is the second stage of life for a butterfly?

    A. egg
    B. butterfly
    C. pupa
    D. chrysalis

3. What is the third stage of life for a butterfly?

    A. pupa
    B. chrysalis
    C. butterfly
    D. egg

4. In what stage does the metamorphosis happen?

    A. chrysalis
    B. butterfly
    C. egg
    D. caterpillar

5. Which of the following is NOT true?

    A. Caterpillars turn into a liquid in the chrysalis
    B. The butterfly may shed its skin 8 or 9 times
    C. Butterflies must wait until blood drains into their wings before flying.
    D. Most butterflies live a short time

6. Select ALL of the things that a butterfly does.

    A. Go through metamorphosis
    B. lays eggs
    C. drink nectar from flowers
    D. mates

7. Why does the butterfly shed its skin?

    A. It is growing
    B. To defend itself against predators
    C. It is hungry
    D. The butterfly is coming

Editor's Note: This is a thoughtful, well researched study to determine the effectiveness of online facilitation for internships in Library Science. Online teaching is vindicated as a positive learning experience within a key teaching/learning arena.

A Paradigm Shift in 21st Century Education:
How Effective Are On-Line Facilitated Graduate Internship Programs?

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Abstract

Graduate education programs are finding the online education arena increasingly exciting. Questions arise however, as to the effectiveness of facilitating internship components of programs that require this component. To examine this concern an online survey was distributed to graduates of a library science program requesting feedback on the online facilitated internship's effectiveness in the development of identified competences for future librarians. The major concern of this article is whether or not online programs are effectively supporting the capstone experience in the development of needed competences. The results of this survey suggest the effectiveness of the online facilitated internship to be positive and point to responsive program improvements to continue to strengthen the online facilitated internship.

This article also scans literature regarding necessary competences for school librarians.

Keywords: online teaching, library science curriculum, internships, school librarian competences, distance learning, school librarian perceptions, theory, practice

Introduction

This paper presents research findings from one element of a broader research study, conducted by the author, on the perceptions of competency development within the school librarian internship experience. The original study was conducted at East Carolina University's (ECU) College of Education, Department of Library Science. This program, accredited by the National Council for Accreditation of Teacher Education (NCATE), a national accrediting body for schools, colleges, and departments of education authorized by the U.S. Department of Education, is offered online. Graduates from a five year time period were surveyed. This master's program, delivered entirely online included a capstone experience, the internship, which is the focus of this research. The internships are served at a physical site, under supervision of an approved local site supervisor, with the university support facilitated through on-line means. It is a three-credit-hour course requiring intensive immersion in the specific library and information science field chosen. In order to determine the success of the online facilitated internship for future school librarians, a survey was administered to practicing school librarians who had graduated from the online program.

There are minimal studies published on perceptions of school librarians on their internship experiences (Marek, 2009; Shannon, 2008). Findings from this study may guide the direction of continuous review of the internship program in universities with online programs.

Background and Literature

A review of higher education both nationally and internationally, will show that universities in the 21st century have begun to avail themselves of the many advantages of online education (Marek, 2009). Increasing access to more learners, greater convenience for those learners, access to greater resources including professional experts, and the opportunity to serve an unlimited geographic area are just a few among the many reasons colleges and universities are adopting an

online format for education. The school librarian graduate program is often dominated by already employed educators, who are committed to structured days in the classroom, and lends itself well to the evolving online environment. The format makes possible the pursuit of an advanced degree for professionals who could not otherwise participate in structured continued education. Although studies indicate student satisfaction with online learning (Dow, 2008), specific components of the graduate education process demand additional scrutiny.

The journey to a graduate level library science degree for school librarians usually involves both coursework and an internship. Students are better able to assimilate what is learned in coursework more thoroughly when they are able to see it in the real life practice (Ball, 2008). While coursework may be effectively adapted to the online arena, breaking conventional teaching modes and making advantageous use of rapidly expanding technology in allowing teacher and student to communicate, exchange work, pursue evaluation/assessment, and generally provide solid core subject education (Guoying, Shunxing, Jiyue, 2005), there are concerns with the internship component. An internship program, the crucial link between theory and practice, offers the complex activity by which individuals may become critically conscious of themselves as professionals through the totality of their real-life experience (Lave & Wenger, 1991), is perhaps the most difficult component to supervise and facilitate in an online environment.

The internship, the capstone of the library and information science program, serves as the bridge for students to integrate theory with practice, through a range of professional activities, responsibilities, and directed project based experiences (Brown., Collins, & Duguid, 1989; Kirshner & Whitson, 1997; Lave & Wenger, 1991; Mitchell, 1990). This component of the graduate program has been widely popular and has also, according to the literature, been effective in reducing the divide between academia and practice. Introducing students to the professional field they have studied through experiential learning is the essence of the internship (Brewer & Winston, 2001; Koteles & Haythornthwaite, 2002; Morehead, 1980). Educators, as professionals involved in the preparation of future school librarians, face challenges in providing clear and visible guidance to the students they teach. Online educators have questions as to the effectiveness of this capstone experience facilitated in an online program. Can an online program successfully support site-based internship opportunities for professional growth and practical experience? What do practicing librarians who have experienced an online supported internship say in answer to this concern? These questions were answered in a study examining the library internship experiences of librarians.

The Paradigm Shift: Praxis Supported On-line

Research conducted by the Center for Technology and Learning, through the U.S. Department of Education's Office of Policy and Program Studies Service (2008), points to the feasibility and effectiveness of distance education in general (Means, Toyama, Murphy, Bakia, & Jones, 2009). This research further expands the author's premise that online library science programs can also offer effective internship programs as well, successfully integrating theory and practice in the online facilitated environment.

Tools are readily available that enable distance educators to instruct, evaluate, and monitor quality, authentic experiences through which interns may see, experience, and make meaning of the reality of the school librarian experience. Library science professionals in academia are routinely using technology in the graduate program to offer coursework online. University supervisors employ this same or similar technology in guiding, structuring, and shaping internship programs. The continuing emergence of new technologies should serve to make this process even more effective. Critical to success of the process is optimum use of current technologies to support a distance education program. Program support services, for online students involved in this study, included a technology help desk for technical questions, video and

video analysis software. Software facilitating, via internet, online conferencing tools, and a full-time student services manager also provided support. Formats for improved access and communication evolve rapidly, individual's skills vary, and therefore participants had made use of various means of online support. Contact information was posted for every faculty member, readily accessible by students. Additionally the university library offered a wealth of online resources to which students had ready access. Course information was available via Blackboard. Social networking and email were used extensively along with the web-based Blackboard to support and encourage interaction. Electronic portfolios were required from graduates of the internship and were used to assess student understanding, progress, and experience. Varied interactive strategies, audio and visual, afforded participants an opportunity to have community and share experiences in the online environment.

Method

An online survey, assessing participant perceptions of the significance of the online library science internship facilitated program in effectively preparing interns for their future role as professional librarians, was employed to gather data for the study. *Perseus*, a web-based survey research tool, was used to format the survey which was disseminated through email addresses. Reasons for the study were explained in an email to each participant. There were no risks to the participants in the study. Due to the web-based nature of the survey there was no personal contact between researcher and participant unless participants chose to contact the researcher via email.

From respondents who took the survey, researchers were able to determine how prepared librarians perceived themselves to be for the roles they would fill as professionals as a result of the onsite internship facilitated and supervised by university officials online. The survey, while quantitative in nature also allowed for qualitative response through the inclusion of an open-ended concern and comment section. To more clearly gauge respondents' perceptions, open-ended questions were included because of the recognition that by focusing primarily on quantitative techniques, additional important perceptions could be unreported by participants (Gall, Borg, & Gall, 1996).

Participants

The population used for this research was delimited to practicing school librarian graduates of an NCATE accredited online Master in Library Science program from a five year time period. Librarians who had participated in internships within the selected five years would have an accurate recollection of the experience and be able to report accurate perceptions. This population was chosen because the online program required completion of an internship as part of the graduate level library science coursework for earning a Master in Library Science degree. A cumulative database of students and graduates of the program facilitated access to respondents. There were no exclusions based on gender, race, color or any other demographic information. An overall survey return rate of 64% was achieved by using the email address database.

Data Analysis

The survey was designed around three themes. Two of these themes are fundamental for the analysis that provides the foundation for this paper: perceptions of the reality of practice based upon the actual field experience; and perceptions of professional identity as a result of the internship experience. Survey questions were based upon factors that were identified in the literature in regard to the professional role of the school librarian. Additional survey information was collected pertaining to individual demographics, educational/teaching backgrounds, specific year of internship, demographics of schools where employed, positions held while in the position, perceptions of the length and adequacy of the internship, and the status of the supervisor of the intern onsite. The data from *Perseus* was downloaded into *SPSS* for analysis. Qualitative responses were coded to identify common themes.

Table 1
Survey Response by Year of Graduation

Year of Graduation	Number of Graduates	Number of Student Interns Per Year	Number of Responses to Survey	Percentage of Graduate Response	Percentage of Intern Response
2002	21	7	6	29%	86%
2003	38	19	9	24%	47%
2004	55	34	8	15%	24%
2005	67	37	12	18%	32%
2006	52	52	27	52%	52%

Survey questions were designed to analyze the impact of the online facilitated internship experience on successful competency development of prospective school librarians. Specifically the questions examined the relationship between the student's perceptions of preparedness and the Library Science Internship experience. Critical background, professional, and demographic questions were included.

Significant school librarian competences.

The evolving demands of librarianship including increased accountability, advanced technological skills, improved services for special needs, in addition to ever increasing diversity have compelled those concerned with the library profession to focus on specific competences and skills (Neely & Winston, 1999, Shannon, 2002). Eight themes emerged in a discussion of competences for school librarians from a review of the literature (see Figure 1). Also as a matter of some significance for this study, as the majority of these graduates would likely practice in North Carolina, a review of the North Carolina Media Coordinator's Performance Appraisal Instrument (NCMCPAI, 2003) proved to be closely aligned with these eight themes.

Practicing librarians were asked to report their perceptions in the development of these identified competences through their online internship experience. Survey questions were designed to incorporate each of the following identified competences.

- Articulating and defining a vision of the organization
- Program administration
- Assessment of information needs
- Mentoring practices and behaviors in the use of information and instructional technology
- Modeling best practices and behaviors in the use of information and instructional technology
- Communication
- Staff development
- Advocacy

Figure 1. Professional School Librarian Competences

Results

Teaching Context

The finding that over 68% of respondents had been classroom teachers prior to the internship experience reflected current literature (Mardis, 07). Of those respondents who were classroom teachers prior to the library internship experience, responses indicated that 28.4% represented primary level teaching experience, while 25.0% represented intermediate level teaching experience, while only 14.8% had experience as secondary level teachers (see Table 2).

Table 2

Teaching Context Prior to Internship

Response	*f*	%
Primary	25	28.4
Intermediate	22	25.0
Secondary	13	14.8

Note. N=88

Professional Roles

Respondents were asked to list the professional roles held in their teaching experience. The roles reported were coded and grouped in categories to accommodate for the many different titles used for similar roles, for example, all who reported serving as chair of the School Leadership Team, were grouped with those who reported serving as chair of the School Accreditation Team or School Improvement Team. Similarly those who reported roles as chair of special groups, for example: Battle of the Books, Geography Bee, or Spelling Bee were reported as School Activity Chair. Team Leader was listed by many but there was no clear indication as to what specific position was held, therefore Team Leader responses were grouped with the School Activity Chair responses. All who reported service specifically on Media or Technology team or Media Advisory Board were grouped together. Three major trends relating to librarians' role(s) appeared when examining the coded data.

The first trend exposed a wide variety of activities reported by librarians across all years of graduation coded under the heading of School Activity Chair. The activities represented many of the general programs and concepts that schools routinely support, such as Quiz Bowl, Spelling Bee, new teacher mentors, peer helper programs, and parent teacher organizations. Librarians reported numerous roles and responsibilities under the heading, School Activity Chair, indicating the wide range of involvement school librarians enjoy within the school community.

A second trend that was apparent when examining the data was the role that librarians fill as members of media and technology committees or technology leaders and program advocates. Reported evidence of this trend supported the literature in regard to the creative leadership role and competences of librarians in advocating for the incorporation of technology and all forms of media into the daily program (Phipps, 2005). The involvement indicated by participants in this category was not as great as the involvement indicated in the School Activity Chair category. The literature pointed to the importance of advocacy for one's program through participation on Media and Technology Advisory Boards and Committees and additionally, this area is integrated as a specific focus of the preparatory coursework for librarians. However, respondents in this study are apparently less engaged in membership on advisory boards and committees, indicating a potential need for expanded focus in order to align the preparation of the students more solidly with the mandates of the profession.

Length of Internship

A total of 71.6% of respondents agreed that the internship was adequate for preparation for librarianship with only 8.0% reporting perceptions of inadequacy in terms of length of internship, as can be seen in Table 3.

Table 3
Satisfaction with Length of Internship

Response	*F*	%
Yes	63	71.6
No	7	8.0

Note. N=88

Table 4
Source of Support for Intern

Response	*f*	%
Program/university supervisor	44	50.0
Site supervisor	46	52.3
District personnel	16	18.2
Principal	11	12.5
Other	11	12.5

Note. N=88

Support for Intern

An important consideration for the success of an online facilitated internship is linked to the support perceived by participants. Collected data clearly affirmed that program university supervisors and site supervisors had served as the primary sources of support for interns, as reported by 50-52% of respondents to this survey. Further, respondents reported that during the internship they had opportunities to observe site supervisors' role in leading long-range planning, communicating with stakeholders within the school community, performing daily librarian activities, and generally serving as advocates for the library program. Respondents reported that they were able to see the theory taught in coursework applied through the site supervisor's actions in the field. Site supervisors encouraged, involved, and provided opportunities for interns to see the reality of practice. One respondent, however, added, "I had a lot of support from the university (online) during my internship but not from the advising media coordinator," indicating the importance of the communication roles of the university supervisor as well as the site supervisor, as a source of support in the online environment. Overall Table 4 indicates that interns positively perceived the roles of both program/university and site supervision. Additional interaction between site supervisor and university professional could serve as the crucible for strengthening the connection between coursework and the practical experience through more in-depth guidance and involvement. One respondent stated that "it would be nice to have more frequent communication with the university supervisor, with more detailed guidance for what I should be doing to help my intern." Clearly supported in the literature (DeWitt and Rogers, 2009) and further verified in this study, frequent communication between intern and university supervisor is a key component in an online facilitated internship.

Table 4
Source of Support for Intern

Response	*f*	%
Program/university supervisor	44	50.0
Site supervisor	46	52.3
District personnel	16	18.2
Principal	11	12.5
Other	11	12.5

Note. N=88

Competency Development

In reference to skills developed in articulating and defining a vision of the organization, respondents to the survey expressed positively, at over 70% that they could both define and communicate the vision of the media center to stakeholders as a result of their internship experience. Survey respondents' perception of competences related to program administration, specifically decision making, assessment of information needs and collection development, respondents reported 83.3% agreeing or strongly agreeing, confirming positive findings for the effectiveness of the online program. Results for the competency regarding the intern's perception of ability to organize the library media collection, showed over 80% either agreeing or strongly agreeing. Similarly, the intern's perception of competency in budgetary management and decision making was positive at over 73%. The intern's perception of ability to conduct assessment of school wide needs for the school library media center again showed over 70% either agreeing or strongly agreeing. Survey respondents reported a strong measure of confidence in ability to make informed decisions regarding assessment, collection evaluation, and budgetary decisions gained through the online experience, affirming the effectiveness of the format.

Librarians also expressed confidence in their competence regarding communication, mentoring, and modeling appropriate uses of media resources. Over 80% of respondents strongly agreed or agreed regarding perception of ability to promote the appropriate uses of technology and media center resources through effective communication (via paper, electronic, or public speaking) with staff and administration regarding the school media program activities and events.

One area that librarians' responses were more conservative was in the competency regarding the intern's perception of ability to design staff development and in-service opportunities for faculty. Approximately 60% reported strong agreement in this area. This is reasonable as staff development is often designed by professionals with years of experience upon which to draw.

Similarly, results revealed, regarding intern's perception of ability to participate in regional, state-level, or system level meetings, 63.9% either agreeing or strongly agreeing, while over 25% reported that they did not feel competent in this area. Again this is not surprising, as it is reasonable to conclude that interns may not have had many opportunities, during the defined internship hours, to attend regional, state-level meetings or conferences.

Overwhelmingly interns indicated that they felt prepared for the professional role of a librarian after completing the online facilitated internship. In the areas of making informed decisions in the processes of collection evaluation/development and organizing the collection, respondents reported high levels of confidence. Similarly a number of respondents reported confidence in areas of promoting appropriate uses of resources and technology and also in communicating with staff and administration. Several interns, in the open-ended section, reported receiving encouragement and positive comments which provided the confidence needed to step into the professional position.

Table 5
Professional Identity

After completing my internship, I felt prepared to …

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Contribute to long-range planning and goal setting for the media center	(43.1%)	(31.9%)	(9.7%)	(15.3%)	(0%)
Communicate the vision of the media center to stakeholders	(47.2%)	(29.2%)	(12.5%)	(11.1%)	(0%)
Make informed decision in the process of collection evaluation and development	(50%)	(33.3%)	(4.2%)	(12.5%)	(0%)
Make informed decisions in the process of organizing the library media collection	(52.8%)	(33.3%)	(5.6%)	(8.3%)	(0%)
Make informed budgetary decisions for the school media center	(36.1%)	(37.5%)	(15.3%)	(11.1%)	(0%)
Conduct assessment of school wide needs for the school library media center	(44.3%)	(32.9%)	(8.6%)	(12.9%)	(1.4%)
Promote the appropriate uses of technology and media center resources	(50%)	(37.5%)	(6.9%)	(5.6%)	(0%)
Communicate with staff and administration regarding the school media program activities and events	(50%)	(36.1%)	(6.9%)	(6.9%)	(0%)
Design staff development and in-service opportunities for faculty	(29.2%)	(36.1%)	(20.8%)	(13.9%)	(0%)
Participate in regional, state-level, or system level meetings	(36.1%)	(27.8%)	(20.8%)	(13.9%)	(1.4%)
Interact with external stakeholders and patrons to communicate the needs of the school media center	(35.5%)	(39.5%)	(11.8%)	(7.9%)	(0%)

It should be noted by planners of online programs, however, that respondents indicated challenges in their preparation, with 14% reporting strong disagreement, in regard to planning; conducting assessment of school wide needs for the school library media center; and also in participating in regional and state-level meetings. Increased attention to these areas during the course of the internship may be needed.

Positive open-ended comments from respondents generally indicated the significance of the online facilitated internship in the preparation of librarians for school librarianship. Examples of open-ended comments included, "before my internship. I felt completely unprepared. However, after my internship, my confidence level was very high," and "the hands on experience I got during my internship made it all meaningful for me. My internship showed me that I had what it takes to be a successful school librarian."

Conclusions and Implications

While few rigorous research studies have been published on the effectiveness of online facilitated internships, the results found in this study were positive. Clearly the internship experience, dependent upon distance facilitation, can support opportunities for professional growth and practical experience. Results from this study reflect the findings from the literature that program change and improvement is an ongoing process in the evolution of online learning (Darling-Hammond, LaPointe, Meyerson, Orr, & Cohen, 2007; Means, Toyama, Murphy, Bakia, & Jones, 2009). Technologies available today are being improved, updated and should serve to make education in the virtual environment even more effective and efficient.

The strong relationship between skills developed in the internship and emphasis of the site supervisor is evident, reinforcing findings from a review of the literature and further validating the theoretical significance of an internship in development of needed competences for librarians. The statistical findings of this study reinforced the significance of the lived internship praxis demonstrating a strong relationship between students' perceptions of preparedness and the library science internship experience. Insights from open-ended questions seemed consistent with the main findings from the survey sections as well. Even so, a small percentage of open-ended responses indicated that at times librarians felt they could have been involved in more meaningful activities during the internship. This may point to a need for more vigilant interaction and communication on the part of the university supervisor with the site supervisor in guiding the activities during the internship. Overall findings, however, indicated that school librarians believed the internship experience prepared them for their professional roles.

The qualitative and quantitative data collected in this study strongly indicate that an online facilitated internship can be effective and rewarding and further, offer a model for programs to build upon. According to practicing librarians, the internship, facilitated from a distance, as a lived experience, does permit future professionals to see and understand the reality of practice, leading to the development of professional identity. Although respondents reported positively on the subject, this study was limited to one major library science program, therefore replication of the study in other programs is recommended. This study did not address difference in competency development between online programs and onsite programs and that, too, remains an avenue for future study.

In order to provide the most effective online programs possible it is essential that professionals in the field continue to self-assess, evaluate curriculum goals and objectives, and incorporate measures of quality into the assessment as suggested by the literature. This study provides a model by which to do that. As university programs strive to provide authentic experiences for interns poised on the threshold of professional involvement, emerging technologies offer an avenue for further expansion of successful programs.

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