THE UTILIZATION OF EDUCATION TECHNOLOGY IN HIGHER EDUCATION

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ABSTRACT

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Trident University International [2017]

With the rise of technology, many educational organizations are scrambling to find ways to incorporate technology into effective learning strategies. Although there is a significant need to equip curriculum with active learning technology objectives, the challenges that are sometimes overlooked lies within faculty perceived barriers and how they contribute to technology acceptance. The goal of this study is to understand how education technology is utilized in higher education and to investigate the issues that may hinder technology acceptance. Further, the researcher seeks to determine if these barriers may lead to inappropriate use of technology and how the barriers align with previous technology acceptance studies.

The study consists of a literature review containing an overview of education technology and how it is currently being used in different areas of education. Secondly, a qualitative study was completed to gather faculty opinions to increase the understanding of associated factors that affect the adoption of technology. The findings reveal that there is a desire to utilize technology by faculty. However, barriers such as time management and lack of training contribute to the reluctance to utilize or use technology in an appropriate manner fully. Lastly, an education technology handbook was created as a reference point for instructors with technology experience at beginning to intermediate levels.

PREFACE

The basis for this research came from my motivation to utilize education technology in my current position. I have been an adjunct instructor for many years, mainly for online classes. In looking at my full-time position, I began to explore ways in which we could utilize technology to become more efficient. The traditional paper files and pen/paper for note taking purposes are nice. However, in years to come, it won't be that way. The world is constantly moving with technology and we must have adequate resources to move forward. It is my passion to look at the different ways in which education technology can be utilized to increase student learning and retention. Further, it is my passion to turn this interest into a blog to remain up to date on trends in education technology.

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INTRODUCTION

Origins of the Research

Education technology has been an emerging issue for many years. Over the years, our economy has become one that has transformed with emphasis being placed on technology. There have been apparent shifts in technology for educational institutions. Computer labs are now becoming defunct, as many students arrive to college with their own computers. With the demand growing for online courses, higher education is feeling the urge to push forward with either blended courses or active learning strategies that utilize technology. Although different areas of research have been explored, it is important to explore how technology is utilized, associated barriers that hinder technology acceptance, and critical resources that can help educators properly utilize technology in their classrooms.

The interest in education technology stemmed from the researcher's background in online teaching and learning, as well as course development. The majority of the researcher's teaching experience revolved around online learning. While online instructors have perceptions regarding education technology, the researcher sought to gain a larger perspective from instructors worldwide. Gearing toward instructional design and course development as career passions, the researcher strived to absorb ways in which schools were using education technology and if it was being maximized.

With technology moving at full speed, it is unclear to the researcher why some instructors and schools are reluctant to embrace it in the classroom. Some schools fear that converting some programs into online structures may diminish the quality of their degrees. Adams (2009) surveyed medical school administrators and noted in his findings that medical school applicants

who completed traditional courses were favored over those who had completed online programs. Does this fear trickle down to instructors and contribute to a reluctance to embrace technology? With technological change taking place over time, there will always be some barriers to overcome. However, it is necessary for faculty perceptions and barriers to be explored.

It is clear that education technology does have an effect on the teacher-student learning experience. While learning can take place without technology, the benefits of utilizing technology should be researched and analyzed. Studies have argued the social interactions and lack of communication as being major pitfalls to using education technology (Joseph, 2012). Differentially, University of California Los Angeles released a report that expressed the benefits of increasing technology in education (UCLA Report, 2007).

The report emphasized that the use of technology in education can provide advantages for students to become active learners who have better communication and collaborative skills (2007). Further, the report highlighted the importance of a planning process when implementing technology, by highlighting that they have developed a broad plan that highlights some of their anticipated technology goals. The report concluded that technology learning should be centered around student learning and that education technology can enhance the education for their undergraduate students (2007).

For organizations to determine how education technology should be utilized, teachers and administrators should first understand its purpose and usefulness in student learning. The form of technology must be examined to see whether it will aid in the increase in student learning or if the active learning technology will provide a benefit for the goals of its use. When determining how technology should be used, the educational institutions must first outline objectives, goals, and specify the purpose for incorporating the technology into the classroom.

Purpose of the this Dissertation Research

The primary goal of this qualitative case study is to understand how technology is used in various educational departments and institutions. Secondly, faculty perceptions and barriers are explored to see if there is a correlation between faculty acceptance and associated barriers. Lastly, the goal is to explore if resources were lacking and if so, could a tool be developed to address these barriers if they existed.

The purpose of this dissertation research is to recognize that education technology has a significant place in higher education. Further, the researcher seeks to identify ways in which technology is being utilized and if it is being used effectively. Additionally, it is important to actually determine what constitutes ineffective technology use. Seeking to investigate the faculty perceived barriers, the researcher hopes to identify key issues that prevent technology from being fully utilized and accepted by faculty.

Dissertation Format

The dissertation format for this study is a three-article dissertation (TAD). This type of format is also known as the article format dissertation. The research study follows a progressive format. Progressive formats usually begin with an extensive literature review and moves into a research study and ends with an application of findings (Trident University International, 2017). The study includes three articles: a literature review, a complete research study, and a practical handbook that can be used for education technology beginners.

Article 1: Overview of Education Technology: A Literature Review

Article One is a literature review that examines the broad scope of education technology. The review gives an overview of technology enabled learning and how it is utilized in various educational settings. Further, the review explores the differences between blended coursework

and online classes. The review examines several research studies that explain how education technology is utilized, along with its significance and benefits. Common barriers are explored through analyzing various studies and each of these barriers are briefly addressed.

A review of the literature indicates that education technology is currently being utilized in different capacities around the world. The review gathered literature on technology enabled learning approaches and how they were being used in complex health professions. It was necessary to examine this literature, as medical schools often prefer traditional learning approaches (Kogan, Stewart, Schoenfield-Tacher, & Hellyer, 2015). Further, the review assessed the differences between blended and online coursework for understanding.

The article also touched briefly on common noted barriers to show a common theme in research studies. It was also important to address the literature surrounding student connective and self-directed learning, since it is a huge part of blended and online learning. Lastly, the review addressed the literature on challenges faced by students and instructors when utilizing technology in the classroom or in online courses.

Article 2: Case Study on Faculty Perceptions and Barriers Associated with Technology Acceptance

Article Two focuses on faculty perceptions and looks at some of the barriers that keep faculty from embracing or accepting technology use in their classrooms. The article included an extensive literature review on the technology acceptance model and how it related to faculty perceived barriers. The goal of the study is to see if faculty perceptions contribute to the reluctance to utilize technology. Further, the researcher seeks to look at the associated barriers and to compare the results with similar studies to see if there are any common themes.

The case study focuses on three research questions: 1) How is online education technology utilized in educational institutions? 2)What are the faculty perceptions of the impact of online course technology in student motivation and learning? 3) What constitutes ineffective use of education technology and how does it affect student achievement and retention rates?

Findings reveal that educational technology is utilized in a number of ways in educational institutions, depending on the course objectives. Faculty perceptions are that although many faculty would like to utilize technology, there appears to be a number of barriers that contribute to a lack of technology use. The findings also reveal that ineffective use of technology can depend on a number of factors including lack of training or misuse of technology. There is no evidence based on findings that technology use decreases student achievement.

Article 3: Utilizing Technology: A Helpful Handbook

Article Three is a handbook that is very useful for educators who are beginners or who have little knowledge of the benefits of education technology. It offers resources, clickable links, and helpful references that can be used in various subjects. The handbook also has some helpful information that educators can use for lesson planning and curriculum development. The goal of this handbook is to help faculty eliminate some of the barriers identified in the previous articles.

Conclusion

Research in the utilization of technology reveals that technology is currently being used in higher education. While it has been embraced in some areas, there has been literature to indicate that it may be underutilized in some student learning objectives (Chang and Hannafin, 2015). The increasing concerns with implementing technology call for a need to further understand the associated barriers and what contributes to a reluctance of faculty members to embrace and use technology in their classrooms. The research study doesn't discount the perceptions of the students. However, the sole focus is to examine faculty barriers and determine if the acceptance reluctance lies in the noted barriers or if there are other issues that decrease the use of technology in the classrooms.

Education technology utilization has been researched in various studies. However, it is unclear of the significance of faculty identified barriers and if the barriers contribute to underutilization of technology in student learning and curriculum. Researchers have noted how technology can have a positive impact on education (Hopson, Simms, Knezek, 2002; Roach, 2013). Research studies have suggested a hesitance to use technology to reform education (Kent and McNergney, 1998; Burbules and Callister, 2000).

Barriers faced by teachers and administrators are a big part of technology acceptance. Kopcha noted that there appears to be a gap between technology available and the instructor's use of technology in the classroom (2012). The author felt that part of this was attributed to certain barriers that prevented the instructors from incorporating technology into their curriculum. He briefly identified some of the barriers to include access to technology, ease of use, time and professional development (2012).

In order to work at decreasing or eliminating some of the noted barriers, they must first be understood and solutions must be established so that they can be resolved. Without confronting the barriers, technology will never be used in its full capacity in the classrooms. This is not to limit technology reluctance to barriers. There are those teachers that are just hesitant to change, regardless of the existence of roadblocks. However, this study will closely examine how the barriers contribute to limited technology use and how some of the issues can be resolved.

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ARTICLE I: OVERVIEW OF EDUCATION TECHNOLOGY IN HIGHER EDUCATION

Introduction

The amount of literature on education technology, including studies on utilization, technology approaches, and technology in higher education, helps to create the basis for this study. Technology-enabled learning has been utilized in education for several years. As many organizations are beginning to embrace technology-enabled learning, it is imperative to address the relative literature to see how it is advancing in practice. The pertinent literature related to this study is divided into different sections: Technology Approaches and Resources, Utilization of Education Technology, and the Significance of Education Technology.

The primary goal of the study is to understand how technology is used and to examine educator perceptions of barriers. Additionally, the researcher seeks to understand what thee barriers are and what prevent teachers from accepting technology and using it effectively. However, one must first understand how technology is being utilized in different education programs. Several studies discuss how technology is implemented in various education sectors. The literature review starts by outlining different learning models to provide an understanding of how technology is used in education. While examining the benefits of education technology, this review will also research some of the barriers to promoting technology in the classroom. It will further identify perceptions from the stakeholders of education and present potential barriers that could affect technology from properly being implemented in the classroom.

Technology Enabled Learning Approaches and Resources

Education technology offers several tools that instructors can use in their classroom. Incorporating technology is a major step for schools focusing on the health professions. Some

studies examine the criteria and argue that online courses are not of the same standard as lab work in brick and mortar learning environments. Adams (2009) conducted a study to assess the acceptability of qualifications of those in a traditional degree program, an online program, or a blended learning program. He concluded that although there are some that share a positive assessment toward those whose credentials include online education, there are some who still hold negative perceptions of online courses (2009).

Similarly, several researchers conducted a comparison study to examine veterinary admissions committee members' perceptions of online students with traditional students (Kogan, Stewart, Schoenfield-Tacher, & Hellyer, 2015). The findings concluded that survey participants preferred traditional coursework than that of online or community college coursework (Kogan, et al., 2015).

Although there may be mixed reviews in health professions regarding technology, some instructors are finding unique approaches to implementing technology-enabled learning. Hassanien (2006) utilized a WebQuest technological tool to make learning more effective. Dodge (1995) notes that WebQuest is defined as a tool that allows learners to interact with internet resources and that the resources may often be supplemented with video-conferencing. Megala and Madhumathi (2016) further emphasized that WebQuest also provides a genuine learning experience by focusing on a number of skills including, reasoning and cataloging.

In Hassanein's study, the researcher utilized computer-based instruction to help motivate the students and increase student achievement (2006). The WebQuest consisted of five different sections, all consisting of different research activities for the students to complete. Students utilize technology to complete each activity. After the sessions concluded, the lecturer gave the

students a tutorial on proper research and motivated the students by assuring them that their chosen methods were not necessarily incorrect.

The researcher was able to gather thoughts and perceptions through the questionnaires completed by the students (2006). He noted through the findings that the majority of the students found the activity to be helpful. The researcher further noted that all of the students found the sessions to be important in some form, stating that none of the students rated the activity in the lowest category (2006). The findings further concluded that students were motivated to learn about different research methods.

Damewood (2016) recently conducted a study where simulation was used as a technology tool in nursing schools. She explained the need for a shift from campus learning to online courses, as a rationale for implementing simulation technology. The author then explained that the shift to technology has come from the increased demands of technology usage (2016). With more schools converting some courses to online classrooms, it is necessary to recognize the place that technology has in health education. She even noted that some computer labs have been replaced due to many students having their own laptops. Therefore, the shift towards utilizing technology is recognized in the nursing field.

Through various resources, technology is being implemented in complex ways. Several researchers have argued that the internet is a great tool for social communing among students (Jang, 2014; Barbour & Plough 2009; Drexler, Baralt, & Dawson 2008). Hung and Yuen (2010) further examined how social media technology could be used in conjunction with face to face instruction in a classroom setting. Using the social media platform, Ning, the researchers concluded that students found the social media interaction to be a place of belonging and described it as being a part of a community (2010).

Social media technology can also be effective in collaborative team assignments (Jang, 2014). In a qualitative study, the author presented findings that concluded how instrumental social media could be in allowing the convenience of students to collaborate with one another through the use of technology. He stressed the implication that technology should be utilized when instructing millennials, who can often be seen as technology driven. Millenials are often viewed as those that were born between 1980-1996 (Howe & Strauss, 2000).

Web technologies have proven to be very useful classroom tools (Saeed, Yang, & Sinnappan, 2009). Many researchers highlight ways in which web-based technologies can be implemented in different courses (Augar, Raitman, & Zhou, 2004; Bennet, Bishop, Dalgarno, Waycott, & Kennedy, 2012). Augar, Raitman, and Zhou (2004) discussed how wikis are utilized in e-learning courses, noting that they can be utilized as forms of icebreakers to help students adapt to the online learning environment. Wikis are described as tools that promote collaboration, by allowing students to create, edit, or synthesize information in a shared online environment (Wheeler, Yeomans, & Wheeler, 2008).

Hew and Cheung (2013) further highlighted frequently used technologies, including blogs, wikis, videos, podcasts, etc. They emphasized the usefulness of blogging in an online environment. The authors outline that blogging can be useful for journal activities or reflection exercises. They further discuss the usefulness of social media and audio discussion boards, noting the benefits of utilizing each tool. The authors noted that tools such as blogging and social media could help with writing and critical thinking skills (2013). These studies are significant in identifying the importance of technology-enabled learning and solidifying its place in education.

Difference between online classes and blended coursework. To gain a more thorough understanding of the resources mentioned above, one must thoroughly comprehend the difference between online classes and blended coursework. Online classes usually take place in a learning management system (LMS). Zilinskiene, Malinauskiene, and Smith (2016) point out the benefits of using LMSs by discussing how it is used in online course learning. Through LMSs, educators can create learning activities for a specific technology (Zilinskiene et al., 2016). Most learning management systems are available anytime and usually house quizzes, discussions, and assignments.

LMSs utilize synchronous and asynchronous forms of communication (Black, Beck, Dawson, Jinks, DiPietro, 2007). When thinking of asynchronous learning, it is described as being communication in the form of discussions, messaging and email (Watts, 2016). The author further describes it as a flexible dialogue that is available at any time, providing the convenience of learning from anywhere. In contrast, synchronous learning usually takes place at a given time and is usually to engage learners in hopes that the student will absorb what is learned (2016).

Blended learning is a combination of face to face communication and online learning. Garrison and Kanuka (2004) note their preferences for blending learning by emphasizing that it is favored over face to face and online learning. By incorporating the blended model, it allows many educators to benefit from the flexibility of online learning (McClintock, 1999). Blended learning allows instructors to mix their courses with technology and also aids them in customizing their course to ensure that both components (face to face and online) are utilized.

Blended learning provides flexibility and can also be used as a means for an organization considering future online courses. Blended learning is being utilized in higher

education to assess its usefulness and is also being used as a student support component (Zilinskiene, Malinauskiene, and Smith, 2016). It goes hand in hand with online learning since technology is a major tool in blended courses. DeRuy (2015) noted that students seem to absorb information when engaging in a blended environment, with onsite and online learning.

Similarly, Kenwright (2012) conducted a blended learning study, combining online learning with face to face learning. The study involved a medical school implementing blended learning to help students learn pathology. The author also concluded that combining distant learning with face to face learning helped the medical students to show a greater interest in pathology.

Both, blended and online learning, comes with its own set of barriers. Kaur (2013) noted that technical challenges are disadvantages for both blended and online faculty. The author further emphasized this by stating that blended and online instructors may use technology simply because it is available, thus creating ineffective usage for the technology (2013). Kaur went on to further discuss the challenges of blended learning, by emphasizing that organizational challenges, such as lack of management participation, can contribute to barriers (2013). It is clear that there will be challenges, regardless of blended or online class methods.

Utilization of Education Technology

Technology has been an important part of education for many years. Engelbrecht and Ankiewicz (2016) emphasize that education technology started to gain momentum in the 1980s. Since that time, technological advances have been made to find creative ways to utilize technology. Instructors in higher education can use many tools to enhance learning in their classrooms (Roberts, 2008). He noted that LMS systems, simulations, and virtual learning experiences, are among some notable education technology tools. Ray and Chkrabarti (2016)

created a study to look at learner feedback and incorporated technology to create a more personable feedback component through facial expression. The authors concluded that it was an effective method and found it very useful in establishing communication with the learner (2016).

Further review indicates that technology is utilized in blended leadership courses for graduate students (Zilinskiene, Malinauskiene, and Smith, 2016). Face to face was used for introductions, to fill out profiles for the LMS that was utilized, and to receive and reflect on pre-course materials (Zilinskiene et al., 2016). The online learning portion consisted of weekly readings, powerpoint presentations, webinars, and reflective assignments. Afterwards, they concluded with face to face learning to complete final assignments and wrap up the course. Through this study, it was found that technology proved to be an effective method when delivered through a blended model.

To determine the effectiveness of the model, the researchers conducted a SWOT (strength, weakness, opportunity, and threat) analysis and had the students complete a 3-5 page reflection on their leadership skills (2016). SWOT analysis is a tool that is used to guide strategic planning decisions (Agarwal, Grassl, & Pahl, 2012). The participants also completed private meetings, which helped to gather feedback. The researchers concluded that blended learning was helpful in providing powerful learning methods for students (Zilinskiene, Malinauskiene, and Smith, 2016).

Researchers have also conducted studies showing how technology is implemented in a variety of settings (Premdas, 2017; Wade, Bohac, and Platt, 2013). For example, technology is being utilized in professional development. Engelbrecht and Ankiewicz (2016) looked at a variety of professional technology development models and explored ways in which those

models should be utilized. Similarly, researchers also examined two formats of professional technology development to encourage teachers to utilize technology to create and implement problem-based technology learning modules (Claesgens, Rubino-Hare, Bloom, Fredrickson, Henderson-Dahms, 2013).

Engelbrecht and Ankiewicz (2016) noted that for professional technology development to be effective, the focus should be solely on the technological content and instruction. To effectively incorporate technology, instructors must receive the proper training and professional development must be ongoing. Technology was also implemented in a correctional setting to provide feedback and instructional delivery for correctional education (Wade, Bohac, & Platt, 2013). The authors noted that new teachers experience apprehension with teaching in a correctional environment, which may cause a lack of preparation. While they may receive education preparation, professional development is needed to prepare teachers for instructing in a juvenile or adult correctional facility (2013). Therefore, ongoing professional development programs are needed. Through virtual coaching models, correctional education instructors were able to mentor and increase professional development effectively (2013).

Significance of Education Technology

As technology begins to grow in higher education, researchers will seek to examine ways in which technology will be beneficial. Several researchers have found education technology linkage to include higher academic performance, greater student achievement, and better student connectivity (Schacter, 1999; Wenglinsky, 1998; Yesseldyke & Bolt, 2007). Through the implementation of technology, there will also be some common barriers (Constantino, 2014; Joseph, 2012; Owusu-Ansah, Neill, Haralson, 2011). While barriers exist,

the goal of education technology assessment is to determine how technology impacts learning and what the implications are in utilizing digital content (Manasia & Bozon, 2014).

Increased academic performance and motivation. In order determine if an e-learning program is effective, researchers must examine the usage, as well as the connection between technology and student learning. Several researchers have conducted studies to address education technology and its effects on academic achievement (Nora & Snyder, 2009; Kori, Pedaste, Leijen & Tonnison, 2016). There is also a link between academic performance, motivation, and technology-enabled learning. Nora and Snyder (2009) conducted a study on the impact that technology had on achievement in mathematics. The findings showed that math scores improved with the use of software and simulation. The authors further noted that academic achievement saw an increase in two classes and created a more positive climate for teachers and students (2009).

While implementing technology can come with adjustments, there are studies to suggest that it is beneficial to students. Hoskins and Hoof (2005) further emphasized the advantages of student motivation in an online environment, noting the web-based learning experience that the students achieve. Students were given access to an online learning environment to supplement their lectures. The students' activities were recorded in the online classroom and they were able to participate in discussion and complete assignments, along with quizzes. The authors' findings concluded that achievement looks promising for learning that utilizes technology.

Similarly, Meletiou-Mavrotheris and Fouladi (2007) noted the impact of technology in a statistics course. The researchers conducted a qualitative study and concluded that the course where technology was implemented had more motivational students than that of the non-technology course. The researchers also explained that student engagement in the technology

statistics course generated a more positive outcome toward motivation. Similarly, Eng, Akir, and Malie (2012) conducted an outcome-based education study where technology was implemented with some students and compared the results to those students that did not receive a technology aide. The study concluded that the mean grade point averages were significantly higher for the outcome based students that utilized technology.

Sheih (2012) also assessed technology-enabled learning and its ties to student learning. Through observations and interviews, the researcher studied the impact of utilizing technology in a physics course. After pre-interviews, the author determined that students perceive that it was going to be a much more difficult course. When adding the TEAL (Technology Enabled Learning) component, students demonstrated a more positive attitude and were receptive to the hands-on and simulation approaches to learning (Sheih, 2012). The findings of the study noted that the student achievement in the class played a role in motivating them to excel further in the course.

Ozkan (2015) investigated the correlation of learning readiness and student motivation in an online learning environment. The author concluded that students were highly motivated and found satisfaction with being self-directed learners. Another study conducted by O'Bannon and Britt (2012) assessed the achievement factors associated with the implementation of Wikis to increase knowledge of technological tools being used for a course. Wikis are websites that can be edited and are available for any user to edit, add, or read the content (Augar, Raitman, and Zhou, 2004). The researchers found that there was a significant rise in achievement and that the Wikis were helpful in providing students with the necessary knowledge of how to use the technological tools (O'Bannon and Britt, 2012). Based on the studies above, research is helpful in showing that there is a link between education technology and student achievement.

Common barriers. There are many barriers associated with implementing education technology. Clark (2006) emphasized the lack of resources as a barrier, by noting that nonfunctioning technology can affect a teacher's perception toward implementing technology. If teachers feel that they do not have adequate technical support, they perceive a reluctance to implement technology into the curriculum fully. Kopcha (2012) also noted several barriers, including time as a major factor in utilizing technology. To effectively plan lessons, time must be set aside for technology-enabled learning.

Joseph (2012) examined the use of technology and briefly highlighted some barriers to education technology and how it impacts teaching and learning. The researcher arranged the barriers into two different categories, student barriers and educator barriers. The student barriers included little to no contact with other peers and lack of self-discipline. The researcher pointed out that some of the educator barriers included plagiarism and lack of support (2012).

Time is also noted as a barrier to utilizing technology (Lim and Khine, 2006; Bauer and Kenton, 2005). Bauer and Kenton (2005) conducted a qualitative study to examine the usefulness of incorporating technology into the curriculum. The findings of the study indicated that teachers did not integrate technology on a consistent basis and noted time as one of the biggest obstacles. The authors explained that teachers needed more time set aside for effective lesson planning. Other barriers noted in the study were "out-dated hardware, lack of appropriate software, technical difficulties, and student skill levels" (2005, p. 519). The perception appeared to be that technology-based curriculum takes longer to develop.

Professional development can also be a barrier to implementing technology in the classroom. To effectively incorporate technology, instructors must be provided with adequate training. Bradshaw (2002) emphasizes that ineffective training can be a barrier to technology

integration for educators. Kopcha (2012) noted that effective professional development and training could help to eliminate some of the barriers that educators face when integrating technology. Another barrier can exist when schools may not have the necessary resources to implement technology effectively (Constantino, 2014). This, in turn, can hinder an instructor's ability to be properly trained to implement the needed technology in their classroom.

Student connectivity vs. self-learning. Ray and Chakrabarti (2016) discuss the effectiveness of technology learning by pointing out the importance of communication between learners and instructors. Greenhow, Robelia, and Hughes (2009) researched the significance of Web 2.0 and its effectiveness in student learning and participation. Web 2.0 refers to the transition in the World Wide Web that moves away from a read-only web program, into a more formal and collaborative network (2009). With the use of social networking, blogs, and other collaborative knowledge, students are motivated to be self-learners. Self-directed learning is imperative in blended and online course learning. Web 2.0 also allows students to remain more connected to their work because many of the components allow students to promote their works while encouraging participation and collaboration (2009).

Hoskins and Hoof (2009) indicated that students benefit from interactive learning and that it enhances their understanding of computer basics. The authors also noted that interaction and more enhanced feedback was also helpful in the online environment. Further findings in this study indicated that the use of the bulletin board also seemed to influence achievement. With the use of Web Course Tools (WebCT), a learning management system, the researchers obtained data through the tracking component of the system and concluded that if actively engaged, bulletin boards offered the ability for students to have a higher achievement. Similarly, Rashid and Asghar (2016) reported a correlation between self-directed learning and connectivity

through technology use in their study. Although there were no direct findings regarding the link between technology and academic performance, the researchers noted that there was a positive relationship with engagement and self-directed learning. The main factor that determined this was the researchers' correlation analysis that examined self-direction and students' technology usage (2016).

Swanson (2010) conducted a study on challenges that online students face when trying to connect with their instructors effectively. The findings indicated that some students find the lack of social interaction to be a struggle and they are unable to establish an adequate connection with their instructors. While this may be viewed as a barrier, the author concluded with best practices to improve social interaction in the classroom. Some of the best practices noted were centered around feedback and communication. The author noted that one of the best practices were to maintain connections with students by providing encouragement and increase positive communication through constructive feedback (2010). He also stated that increased social activity could be viewed as having a positive effect on retaining students. Based on the studies above, there appears to be a link between student connectivity and self-directed learning.

Conclusion

In conclusion, this chapter reviewed how education technology is utilized in organizations. The review of the literature indicated the various uses of technology in education. It further emphasized different resources and the manner in which they are implemented. The review also noted some barriers associated with faculty and students. Studies revealed various technology adoption models and how they were applied in different educational settings. Some studies noted the underutilization of technology. However, further study is needed that solely focuses on the technology not being utilized in schools, for reasons other than the lack thereof.

Technology acceptance models have been used to predict how educators will accept and adopt technology. However, it is unclear if the use of the models had any direct effect on the educators' reluctance or acceptance of the technology. Lastly, the chapter noted the link between student connectivity and student learning. Further research is needed to address ways to overcome the noted barriers. Although there are studies that note some barriers, many are limited and don't explore how these barriers can be resolved. Despite the barriers, education technology has positive impacts for educators and students when used effectively.

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ARTICLE II: CASE STUDY ON FACULTY PERCEPTIONS AND BARRIERS ASSOCIATED WITH TECHNOLOGY ACCEPTANCE

Introduction

Educational institutions assess the needs of students and develop creative ways to provide a richer learning experience. According to De George-Walker and Keeffe, students have shown an interest in utilizing technology in the classroom (2010). From solely online learning to blended-learning environments, there are many technology solutions available to meet the needs of the organization. However, it is important to examine and understand the ways that technology is being implemented in higher education to identify the most effective ways to use technology with students. Using a qualitative method of study, this research paper examines how education technology is currently being utilized in the education field, effectively and ineffectively, and creates an informative roadmap to choosing and implementing technology in the classroom.

Statement of the Problem

Technology can serve a variety of functions in a learning environment. Technology-enhanced learning has shown to be an effective learning approach that helps to increase student engagement and motivation (Sun, 2014). Price (2011) emphasizes how education technology can be used as a motivational tool and a retention tool for those students who are battling with the overwhelming pressures of being a student. Sun (2014) notes that the use of polling technology helps to increase student attention spans and also provides helpful ways for faculty to improve their teaching approaches.

One of the methods utilized in this approach is the use of clicker technology. Lantz (2010) noted that clickers are individual response devices that are used to create a more interactive and

hands on approach to learning. Clickers are tools that are used for ground classes, although similar forms of polling can be used asynchronously with Powerpoint. The author describes the operation of clicker technology by detailing how a response is sent to the clicker device using a number of different formats (2010). The responses can be anonymous or data can be collected, showing the number of correct responses. One key benefit of polling is that it provides immediate feedback to the instructor. Therefore, instructors can see in real time how students are understanding the material.

However, when choosing the proper technology for a class, it is imperative that the technology aligns evenly with the goals of the course and the intended use of the resource. Kirkwood (2014) notes that instructors could properly utilize technology to take their didactic courses a step further by adding interactive resources, such as blogs, online discussions, and podcasts. The author further assesses how the outcomes are dependent upon how the teacher chooses to use the tools. Barak (2010) emphasizes the role of teachers in a student's use of technology by pointing out ways in which instructors can enhance their knowledge to promote the self-learning component of technology properly.

Purpose of the Study

The purpose of this qualitative study is to review how education technology is utilized in higher education institutions and how it can enhance several areas of academia, including retention, student achievement, and educational resources, by connecting students most closely to the goals of the courses and their instructors. It is also important to examine how technology education barriers contribute to the reluctance of educators to accept the technology education model.

The study consists of prior research studies and surveys. The participants in the study are educators and are limited to no more than 400 instructors who may utilize online resources in addition to classroom instruction. The setting for the study includes an online panel, provided through PollFish's premium service. The surveys are implemented through the portal and the data is collected through PollFish. Participation is optional and the panel is a private and secured portal.

Conceptual or Theoretical Framework

This study explores how technology is utilized in educational settings, with the main focus being on higher education learning environments. As colleges and universities experience increased enrollments, it is imperative that organizations begin to explore online learning. Several factors, such as living expenses, flexibility, and travel responsibilities are pushing many students to pursue online learning as an option to traditional learning (Appana, 2008). The research study is beneficial because it seeks to explore further research into the barriers that affect technology-enabled learning.

Numerous studies examine student perceptions and attitudes towards technology-enabled learning. However, there are very few studies that examine how the utilization affects faculty and the barriers that exist among educators. As Mosley (2013) states, there are a relatively low number of sources that address the barriers associated with the utilization of technology-enabled learning. Although many studies seek to explore the benefits of education technology, little emphasis is placed on faculty perception barriers that may cause acceptance of embracing technology in the classroom.

In examining research, this paper looks at the overall use of technology and how it is applied in various educational organizations. Current research looks at the use of technology but

not necessarily how an instructor can choose technology specifically designed to complement their course goals and student connectivity. Therefore, it is important to provide information related to how instructors utilize technology-enabled learning in their classrooms. By first looking at ways in which technology is being used, we can then review faculty perceptions and barriers that may affect the application of technology and learning goals.

A qualitative case study research format is utilized for this study because it examines similar research areas and looks at recommendations made for further study. Through those recommendations, this study addresses some of those areas not already addressed in other studies. The literature review includes studies from other case studies and scholarly articles that are also peer-reviewed, along with surveys. Mosley (2013) indicates that further research is needed on how technology is utilized in compliance with curriculum and classroom instruction. Therefore, it is imperative that these areas are examined further.

Literature Review

In reviewing the literature on the acceptance of technology in education, it is important to gain an understanding of the technology acceptance model and what contributes to the barriers associated with the reluctance to utilize technology in the classroom. Technology-enabled learning is becoming widespread, with colleges and universities taking on many different delivery approaches. While education technology is rampant in several organizations, there is not a significant amount of literature to determine what effect technology acceptance has on the utilization of education technology. To determine what constitutes acceptance, there must be a deeper understanding of the link between technology acceptance and faculty perceived barriers of education technology.

Overview of Technology Acceptance Model (TAM). The Technology Acceptance Model (TAM) is a philosophy that seeks to accept and adapt technology in their organizations (Christensen, 2013). Davis originally introduced the TAM in 1986. His overall goal was to investigate a user's perception and behavior toward information technology (Davis, 1989). Several researchers provide fundamentals of the technology acceptance model, mainly claiming that it explores the various stages from perception to the accepting of technology. Christensen (2013) notes that when considering technology, users often form beliefs or perceptions about the technology. The author describes the steps as being all related to the use of the technology. Similarly, Bagozzi (2007) describes the strength of the TAM as one that looks at the influence of technology and how others perceive it. The author further describes the TAM as a structure that is used when describing decisions made by individuals.

Use of TAM in Education. The technology acceptance model has been used in the education environment in several capacities. Chen and Tseng (2012) used the TAM to examine the behaviors of those who utilized a web-based learning service. The researchers distributed questionnaires to participants to look at factors that contributed to the perceived usefulness of the learning system. They concluded that the students accepted the technology due to the user-friendly web-based learning and they were also motivated to use the technology. Further, the authors concluded that computer anxiety was a major factor that contributed to those students who were less reluctant to embrace web-based learning.

Similarly, Hu, Clark, and Ma (2003) conducted a study on technology acceptance from teachers attending a PowerPoint training program. The researchers utilized the model to look at the patterns of technology acceptance determinants by examining the instructor's perceived ease of use towards the presentation software. After conducting a longitudinal study, the researchers

measured acceptance and found that the determinants, such as the ease of use, played a large role in the continued acceptance. Other determinates noted were technology usefulness to teaching objectives and professional orientation and training (2003).

In another study, researchers assessed the teachers' intentions to use technology (Teo, Lee, Chai, and Wong, 2009). The TAM was used as the framework and teachers were given a survey that assessed the ease of use, perceived ease of use, the intent to use, and the perceived usefulness. The study concluded that the attitude towards computer usage plays a role in the determination of the intent of the technology (Teo, Lee, et al., 2009). The teachers found that the technology was easier to use and had positive attitudes toward computer usage. The authors noted that some of the teachers had just completed an IT training course and that may have had an effect on the perceived ease of use (2009).

Role of Faculty Perceptions and Barriers in Technology Acceptance. Interest in how faculty perceive technology is important in assessing their acceptance of technology. Associated barriers can also contribute to a teacher's perception of the use of technology. In a study, Clark (2006) emphasized the barriers associated with lack of resources and stressed that inadequate resources could influence the perceived use of ease when implementing technology. Without adequate training and support, faculty may be more reluctant to accept technology fully. Therefore, it may lead to little or inadequate use of technology.

Similarly, Chen (2009) conducted a study on barriers associated with technology adoption in higher education institutions. He noted the associated barriers that may hinder faculty and administration from moving forward with distance education-related technology. The author concluded that faculty participation barriers were related to faculty workloads, motivation, and

rewards for utilizing distance education in their course offerings. The noted barriers contribute to the reluctance in accepting technology.

Wingo, Ivankova, and Moss (2008) further addressed these associated perceptions and barriers in their study. In a literature review format, the authors noted some associated literature regarding technology acceptance. The review revealed some findings regarding faculty perceptions and how they are viewed as barriers, which hinder instructors from adopting online learning environments. The authors further emphasized the importance of understanding faculty perceptions before implementing technology programs into strategic plans (Wingo, et al., 2008).

Methodology

Research Approach. The research method that was utilized was a qualitative research method consisting of surveys. Julien (2008) emphasizes the importance of surveys by explaining that questionnaires can be helpful in gathering information about perceptions and goes deeper with providing details about experiences. The tool that was utilized was The SAGE Encyclopedia of Qualitative Research Methods (Given, 2008).

Focusing on the identified problem of aligning technology to course goals, the surveys were utilized to gather how faculty utilizes current educational technology in the classroom and to gather pros and cons of online learning in particular courses. Faculty were chosen at random because it was an optional participation survey. Since the survey was posted on the panel for a limited time, participation was on a limited, voluntary basis. Only those registered and verified were able to respond since it is a password-protected portal that is only available to registered members.

Research Design. The research design was a qualitative case study. As Given (2008) notes, case studies seek to examine and analyze a particular phenomenon in depth. Technology-

enabled learning was studied in detail to explore how it is utilized in higher education. Through surveys and prior research studies, the study helped to seek answers to the usefulness of education technology in traditional blended education settings. The case study type was a multiple case studies research design because it looked at different studies to find similar results and identify any links to the similar outcomes.

Research Questions. The purpose of this study was to determine the factors that make certain educational technology the best choice for a specific class and instructor. The primary research questions are:

- How is online education technology utilized in educational institutions?
- What are the faculty perceptions of the impact of online course technology in student motivation and learning?
- What constitutes ineffective use of education technology and how does it affect student achievement and retention rates?

Research Site. The research population was instructors in various educational settings. The faculty who participated in this survey have a variety of experience, ranging from beginners to experienced instructors. The survey was administered through the Pollfish.com panel service. Pollfish is an online survey platform that can reach a global audience. You must have a username and password to create surveys through Pollfish's service. The panel service is also a premium feature that is designed to allow members to choose surveys that are administered to specific demographics, meeting certain criteria.

The survey could only be completed online and through Pollfish's secure service. It was reliable in that the researcher generated the survey through the confidential and secured portal. The survey was then reviewed by a panel expert employed by Pollfish to ensure that the

participants have confidential protection. The survey was administered and handled through their portal and allowed the researcher to remain in complete control of the data. The data is stored in a password-protected area that can be accessed at any time.

Population and Sample. The population for the study was faculty members who are employed at schools around the world. Some instructors are full-time faculty and others are adjunct instructors. Therefore, they may be employed full-time at multiple universities. The population may also consist of educators who have hybrid roles and may also have some administrative duties. The faculty represent multiple age ranges and may be seasoned or new faculty members, as the criterion does not specify a certain amount of teaching experience.

The sampling method used was non-probability sampling. The study used both convenience and purposeful sampling. Educators were not required to complete the survey and it was solely based on them viewing the panel and deciding to respond to the survey. As a result, convenience sampling was used here. The purposeful sampling was that instructors must have taught or been in the process of teaching at least one course. Therefore, there was a possibility that the educator may not have completed a full semester of teaching.

The selected sample population consisted of about 400 participants. Of this number, about half of the participants were expected to complete the survey. Therefore, the participation estimation was that half of those that have access to the survey will participate in the survey. By this estimation, the survey generated more participation than the expected sample size.

Instrumentation. The survey (see Appendix A) was comprised of both a Likert scale and open-ended questions. The survey items consisted of two portions, the first portion being on a five-point scale. The Likert scale questions ranged from strongly agree to strongly disagree.

Strongly agree was assigned to a point value of five, agree had a value of four, neutral had a value of three, disagree equaled to two, and strongly disagree had the lowest value being one.

The open-ended format consisted of five questions and was optional. Content validity was used to ensure that the survey questions adequately reflect an understanding of how education technology is used and perceived by educators. As Markus and Smith (2010) note, content validity ensures that items are representative of the domain that the test seeks to measure. All of the survey questions were designed to ensure that it measured the use and experience of education technology and also that it further assessed the barriers associated with technology underutilization.

Data Collection. To recruit participants, a post was created in the panel portal. Through this post, the researcher asked faculty to participate in the survey. The informed consent was collected via the secure portal. Each participant was assigned a random identification number to protect their identity. The survey data was collected through PollFish. The survey results are stored in a file on a password-protected zip drive. All data collection took place in the PollFish secure portal.

Data Analysis. The survey data was transferred to an Excel Spreadsheet. To analyze the data, the researcher used the process of coding. The coding process was utilized to randomly generate numbers to indicate the code. The coding followed a certain theme to help identify certain areas. Since the survey contained some open-ended questions, each area was chunked and sorted according to each question. From there, the study was analyzed using the Constant Comparative Analysis method.

Following the steps outlined by Moustakas (1994), the study was analyzed by looking at common patterns or themes when identifying technology perceptions among faculty.

Triangulation was utilized to analyze the data from the open-ended questions against the data retrieved from prior research studies. The researcher conducted a comparison to understand the motivating factors for technology perceptions.

Trustworthiness and Credibility. To make sure that all participants were treated fairly, participant rights were thoroughly explained, along with the benefits of participating in the study. It was also explained that the surveys were anonymous and completely voluntary. A written statement was provided to the subjects explaining their informed consent. Participants' information was confidential when analyzing the data.

The survey did not ask for names or places of employment but were coded by gender. The codes, results, and all documents are kept on a password-protected flash drive and will be retained for a certain period. After the time has elapsed, the data will be destroyed.

Limitations. The limitations of the study were that the faculty participants may work in multiple universities and may be exposed to education technology by more than one method. Each participant is assigned a unique code to prevent duplication. The survey questions were specific; however, it was unknown whether faculty drew from their experiences at one university or if they based their answers on multiple experiences. Therefore, the diversity of the faculty may have affected the outcome of the study.

The faculty's knowledge of different technology options could also be a limitation. While it was not the intent of the study to focus on their experiences at other universities, it was a possibility that this may be reflected in the open-ended questions. Further study may be needed to examine a more controlled population, such as faculty in one school and located in one department.

Delimitations. Controlled influence of the study was the decision to focus the research on faculty perception. This is not to discount the student's perception of the influence of technology-enabled learning. However, the purpose of this specific research was to focus on faculty attitudes and behaviors regarding education technology. It was also the hope to investigate some of the barriers that faculty identify with technology and curriculum. Therefore, the study centered on how faculty utilizes technology in their classroom to meet curriculum demands.

Results

Introduction. The purpose of this study was to examine information related to the study on how education technology is utilized and the common barriers associated with the acceptance of technology. The researcher chose to explore the use of education technology because of her career field. Desiring to move solely into instructional design and course developing, the researcher hoped to learn more about the perceptions regarding technology and the associated barriers that aid in the reluctance to utilize or accept education technology in the classroom. Further, the researcher hoped to examine what properly constitutes the utilization of effective technology practices.

Survey Description. The survey was comprised of 15 questions, although the informed consent at the beginning of the survey made for the 16th question. The survey questions were composed of Likert scale format, multiple choice, check all, and open-ended questions. Half of the questions were designed to get an idea of how education technology was currently being used in the educators' teaching environment. The other half of questions were to understand the faculty perceptions, as well as gain a level of awareness of the education technology programs that are currently being utilized by the participant. The open-ended questions were to understand any

barriers associated with technology underutilization. The survey was designed to be completed in less than 60 minutes and focused on identifying key barriers associated with technology acceptance. The following demographics are included as general information.

Demographics. The number of respondents far exceeded the expectations of the researcher with 400 respondents. All respondents were asked to provide their informed consent to participate in this study anonymously. The respondents were almost evenly divided between male and female, 53% (210) males and 47% (190) females (see Appendix B).

The respondents were asked to identify their age based on five categories; 18-24 years old, 25-34 years old, 35-44 years old, 45-54 years old, and 55 years old or older. The largest group of respondents, almost 68.5%, was 34 years old and younger. This group was almost evenly divided between the two age categories and gender. The respondents between 35 and 44 years old were the next largest group at 18.5%, almost half the size of each of the previous age groups. This group was also evenly divided by gender. Only 10% of the respondents identified as being between 45-54 years old and 59% of those were females. Finally, a small 3% of respondents were over 55 years old and a large number (64%) of them are male.

Almost half of the respondents (40%) have only taught 1-5 years. The number that has taught 5-10 years equaled 23% and the number that taught over 10 years was 21%. Interestingly, 16% answered "other" on this question, most likely meaning they have taught less than a year or only teach part time.

Table 1

Demographics

Gender		
Female	190 (47%)	
Male	210 (53%)	
Total	400 (100%)	
Age Range		
18 – 24 years	130 (35%)	76 (58%) male 54 (42%) female
25 – 34 years	134 (33.4%)	67 (50%) male 67 (50%) female
35 – 44 years	81 (18.75%)	41 (51%) male 40 (49%) female
45 – 54 years	41 (9.5%)	17 (41%) male 24 (59%) female
55+ years	14 (3.25%)	9 (64%) male 5 (36%) female
Years of Teaching		
1 – 5 years	158 (39.5%)	
5 – 10 years	91 (22.75%)	
10+ years	85 (21.25%)	
Less than a year or part time	66 (16.5%)	

Methodological approach. The approach for this research was the case study research method. Seeking to learn more about the various perceptions of technology, it was important to examine prior research studies. In looking at the purpose of this research, the main reasoning was to gain a deeper understanding of the acceptance of education technology. It was also the hopes of the researcher to see if there is a link between faculty perceptions and the reluctance to accept or properly utilize education technology. Therefore, a case study method was best in seeking to explore the topic in depth.

Comparison with prior research studies

Study 1. Chen (2009) conducted a study to analyze barriers that prevent schools from establishing or expanding distance learning options. The researcher focused on two specific barriers, which were program costs and faculty participation issues (2009). Focusing on the second barrier, the researcher surveyed participants to determine what faculty barriers prevented them from creating online courses. The author concluded that faculty workload concerns, along with low faculty rewards, were barriers that prevented faculty from embracing distance learning courses.

Study 2. In a similar study, researchers used the technology acceptance model (TAM) to reveal faculty perceived barriers to students succeeding in online classes (Wingo, Ivankova, & Moss, 2017). The constructs used in the model were perceived ease of use and perceived usefulness from Davis's (1989) original TAM model. The researchers concluded that faculty found the use of technology to be a barrier due to lack of training and the difficulty in using technology (Wingo et al., 2017). The researchers also noted that faculty valued professional rewards which resulted from teaching online courses and that there was a link between positive faculty reception to technology.

Results Summary

Research Question 1 - How is online education technology utilized in educational institutions? It is evident that education technology is used in a variety of ways in educational settings. However, it is important to look at how often it used and to examine the proficiency level of technology use. By gathering this information, the researcher can see if the technology experience contributes to the overall attitudes and perceptions regarding technology acceptance. Based on the study results, education technology is currently used by some instructors. Most educators (75%) either agreed or strongly agreed that they utilize education technology in their classrooms.

Interestingly, Generation X (respondents 45-54 years old) had the highest usage of education technology and Baby Boomers (respondents 55 years old and older) had the lowest usage. According to the Center for Generational Kinetics (n.d.), Generation X'ers are those born between 1965-1976 and Baby Boomers are those born between 1946 and 1964. Literature suggests that millennials exposure to technology makes their technology need greater than the other noted generations (Prensky, 2001; Prensky, 2010; McMahon & Pospisil, 2005). Millenials are defined as those that were born between 1980-1996 (Howe & Strauss, 2000).

Therefore, it was surprising to see that millennial instructors are not utilizing technology in their classrooms as much as those of other generations. Although the heaviest use of current technology use went to Generation X users, all generations were likely to be using technology in their classrooms.

Research Question 2 - What are the faculty perceptions of the impact of online course technology in student motivation and learning? To determine the role of faculty

perceptions in technology acceptance, it was imperative that we looked at the value of technology in the classroom. The respondents were asked about technology-enabled learning. The results showed that 95.75% felt that technology-enabled learning should be a part of student learning. The question was an open-ended, which asked the respondents to give a reason for their response. The majority of participants felt that it helped with learning. Of the small amount of respondents opposing, the reason given was the physical effects of looking at a computer screen for an extended period. Interestingly, the instructors felt that there was value in utilizing mobile technology in the classroom. Although they found value in mobile technology, their preference seemed to be in favor of limiting the usage to computers.

Research Question 3 - What constitutes ineffective use of education technology and how does it affect student achievement and retention rates? The respondents were asked about associated barriers with utilizing technology. The question was geared toward technology and the perceived comfort of using it in the classroom. The researcher first asked the respondents a series of questions designed to measure their level of comfort in using technology in general. Consistently, 75% of the respondents stated that they were comfortable with technology and had adequate technical support when they needed it. The same number was open to use technology if they were provided training and support. There was no significant variation in these numbers based on the respondents' gender, though as expected those 55 years and older did fall slightly below the 75%. Interestingly, those identified as 18-24 years old also fell slightly below the 75%.

The respondents were asked if they perceived barriers to using technology in their classroom. While only 19% said yes, when asked what barriers they encountered in an open-ended question, several provided at least one barrier. Some of those barriers were related specifically to the physical hardware needed to conduct effective lessons. Since respondents

represented several different countries, many identified issues with power supplies and bandwidth speed.

Participants also noted issues with the software and web based parts of technology. Due to software updates and changes, respondents noted the difficulty with maintaining up to date training. Limited access to proper supplies was also seen as a hindrance. Some faculty stated that they had limited or no access to web platforms due to the college and university policies around data usage. In fact, several faculty found that their ability to embrace technology was hindered by their place of employment because the administration did not see it as a priority or had created policies to discourage the use of technology.

While most recipients did not identify large barriers to their use of technology in their classes, the researcher found an unidentified barrier while analyzing the results. As stated before, 75% of the participants claimed to be comfortable with technology in general. However, when asked specifically about their comfort level with "education" technology, 75% stated they were not comfortable. When asked how they used technology in their classrooms, only 38% said they used it for active learning. All other responses were related to administrative tasks like record keeping.

In an open-ended question, the respondents were asked which education technology options were familiar to them. Technology options related to creating and storing documents (i.e., Microsoft Office and Google Docs) received the highest recognition. Social based technology like Facebook, wikis, and blogs were the next on the list. A few participants said they were familiar with podcasts and learning management systems (LMS).

However, unless the user is trained, none of the technology listed above is specifically designed to aid in active classroom learning. Very few respondents were even familiar with

technology specifically designed to create online classrooms with streamed videos (like Storyline, Camtasia, and Captivate), discussion boards, online quizzes (like Quizlet), and other real-time interactions between students and educator. They were also not familiar with technology that allows students to design and code their own learning programs, such as Javascript and Visual Studio.

The results reflect the educators' desire to embrace technology to enhance student learning. However, their lack of familiarity and training with specifically educationally designed technology do not allow for effective active learning in their classrooms. Based on the results of the study, it is unclear whether this barrier has had a bearing on student achievement and retention in their organizations. Further study on a controlled population would have to be conducted.

Conclusions

The two studies focused on different perceived barriers from this current study. They both came to their studies with a preconceived idea of what barriers they would find, specifically reluctance to use technology and the students' inability to achieve because of technical issues. Neither study specifically focused on the type of technology being used by the faculty. Therefore, their results do not reflect the results of this study.

Based on the results of this study, the researcher concludes that faculty, in general, are receptive to using technology to enhance learning. Faculty members are familiar with most basic tools but do not know or use software and programs specifically designed for educational programs. Therefore, the faculty need specific training and support in order to make the most of technology in their classrooms.

Based on data, this researcher will be developing a handbook for faculty to help them identify and use educational technology that will match the technological goals of their classes. It will be useful, whether the courses are online or on-ground. Further, this handbook will be useful to not only higher education organizations, but to K-12 schools as well. Different education technology implementations will be explored to determine how it is being utilized and if any improvements should be made. Although there are great programs, it will not be beneficial to students and instructors if there is no implementation plan. As Kirkwood (201) maintained, there should be specific goals aligned with utilizing technology in curriculum. It must be fully utilized for the technology to be an efficient part of the educational plan or curriculum.

For Further Study

Even with training, faculty see the school administration as a barrier in using technology. They perceive administration as unsupportive and with total control of how faculty and students can access technology (i.e., discouraging use of mobile devices, capping data access, not spending money on adequate power and data supplies). A further study on why school administration is not receptive to the use of technology to enhance learning may be beneficial.

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ARTICLE III: UTILIZING TECHNOLOGY: A HELPFUL HANDBOOK

By: Angela Brooks

Part I –Introduction to Education Technology

Preface. Higher educational institutions have been assessing the needs of students to develop creative ways to provide a richer learning experience. According to De George-Walker and Keeffe, students have shown an interest in utilizing technology in the classroom (2010). From solely online learning to blended-learning environments, there are many technology solutions available to meet the needs of higher education classrooms. However, not every piece of technology will work in every classroom. And not every educator will be comfortable with different technologies. This handbook will create an informative roadmap to choosing and implementing technology in the classroom, even for the most reluctant educator.

Rationale. While colleges and universities have experienced an increase in enrollment, the number of "traditional students" has declined. In the past, a student would enter college directly after high school, live on campus, and complete their degree in the standard four years. However, in today's society, several factors, such as living expenses, the need for flexibility, and travel responsibilities are pushing many students to pursue online learning as an option to traditional learning (Appana, 2008).

Even for traditional students, technology enhanced learning has proven to enrich the learning experience. Students in online and blended learning environments have found that it allows more flexibility since most can keep their full-time jobs and also still devote time to families (Cengage, 2017). Educators using technology in their classes also find better engagement with their students and a way to measure and improve their teaching (Sun, 2014; Price, 2011).

Purpose. The purpose of this handbook is to assist educators with the understanding of technology enabled learning and to provide resources for choosing the correct technology for

their classes. Current research looks at the use of technology but not necessarily how an instructor can choose technology specifically designed to complement their course goals and student connectivity. This handbook will help the educator move beyond just using videos, online articles, and social media, and will give them the tools to assess the needs of the class and its students.

This handbook is also designed to address the common barriers that stop educators from using technology in their classrooms. The benefits of technology enabled education has been well studied, though usually only from the perspective of the student. Little emphasis has been placed on the perception of the educators, positive or negative. However, ultimately it is the educator's willingness to embrace technology enhanced education that will determine the effectiveness of the tool.

Difference between online classes and blended coursework. Online classes require that all pieces of the coursework be accessed and submitted online by the student. Most colleges and universities rely on a learning management system (LMS) to organize their classes. The student accesses the LMS to view video lectures, download articles, take quizzes and tests, turn in assignments, and participate in proctored discussions.

Blended learning is a combination of face to face communication and online learning. Blended learning allows educators to mix their courses with technology and also aids them in customizing their course to ensure that both components (face to face and online) are utilized. Blended learning classes are often offered as an introduction to online learning, easing students into the use of technology in their classes. Blended learning environments are also ideal for students who are in fields that require both knowledge attainment and hands on experience.

Significance of Education Technology. Technology enabled learning started to grow in higher education in the 1980's. Each generation of learners has shown a greater preference for technology in education. Several researchers have found education technology linked to higher academic performance, greater student motivation, and better student connectivity (Schacter, 1999; Wenglinsky, 1998; Yesseldyke & Bolt, 2007).

Higher academic performance. Nora and Snyder (2009) conducted a study on the impact that technology had on achievement in mathematics. The findings showed that math scores improved with the use of software and simulation. The authors further noted that academic achievement saw an increase in two classes and created a more positive climate for teachers and students (Nora & Snyder, 2009).

Greater student motivation. Eng, Akir, and Malie (2012) conducted an outcome-based education study where technology was implemented with some students and compared the results to those students that did not receive a technology aide. The study concluded that the mean grade point averages were significantly higher for the outcome based students that utilized technology (Eng, Akir, & Malie, 2012).

Better student connectivity. Ray and Chakrabarti (2016) discuss the effectiveness of technology learning by pointing out the importance of communication between learners and instructors. With the use of social networking, blogs, and other collaborative knowledge, students are motivated to be self-learners. Self-directed learning is imperative in blended and online course learning.

Categories of Technology Enabled Learning. There are many ways to introduce technology into the classroom. The following is a list of the most popular tools used by educators in colleges and universities.

Social Media. Social media is probably the most popular and known technology used in education. Social media can provide educators and students real-time communication tools. It can also connect them to a larger body of knowledge by subscribing to or following specific pages and people. Social media has been shown to provide students a sense of belonging to a larger community. It has also been linked to greater collaboration in learning (Hung and Yuen, 2010; Jang, 2014).

Wikis. Wikis are online encyclopedias of knowledge. Used correctly, a wiki can be a tool that promotes collaboration, by allowing students to create, edit, or synthesize information in a shared online environment (Wheeler, Yeomans, & Wheeler, 2008). Wikis can also provide students a starting point for identifying useful primary sources for research.

Blogs. Many students already regularly read or post to a blog. Blogs can be used as a tool for journaling and reflection in a course. Encouraging students to read and respond to other blogs will promote their writing and critical thinking skills.

Learning management systems. As described above, learning management systems provide a platform for the higher education institutions to house all parts of an online class from multimedia, such as videos, to discussion boards. Most institutions already have an LMS in place. However, it is imperative that the system be user-friendly both for the student and the educator. Used correctly and fully, the learning management system provides easy access to all parts of the class, eliminating the need for multiple accounts across various technologies.

WebQuest. A WebQuest is a scavenger hunt for information. When creating a WebQuest, the educator will give the students a series of tasks to be completed using online resources such as blogs, wikis, videos, and discussion boards. WebQuests are a student-directed tool that strengthens the students' ability to reason and catalog as they learn.

Simulation. Simulation technology has become popular in medically based fields such as nursing and veterinary sciences. Simulations take the place of live experiments. With new technological advances, simulation tools can provide a life-like experience for the learner.

Polling. Polling, or surveys, may not seem like a useful educational tool. However, a poll can provide insight into the thoughts of a specific group of people. That insight can be used for research, provide the basis for a critical essay on a topic, and help students and educators evaluate their performance in their work.

General Myths. Two prevalent myths often prevent higher education institutions and educators from using technology enabled learning effectively.

Reduction of academic standards. The myth that follows technology education the most is that it will reduce the academic standard of the learner. However, as addressed above, most studies have shown that used properly, educational technology enriches the learning experience. The myth has most likely developed because of the newness of technology enabled learning and the risk of using it improperly.

Student connectivity vs. self-learning. Higher education has always been a balance between students learning how to learn and function independently while still feeling connected to others. Technology enabled learning requires that students become more self-sufficient in their studies. It can also leave some students feeling isolated or disconnected from their peers and educators. While technology may reduce the amount of face to face interaction, it can also provide a deeper connection through shared discussions and collaborative work.

Faculty Concerns and Barriers. In addition to the myths above, some other common barriers inhibit the use of technology enabled learning (see Appendix B).

Lack of training. To effectively incorporate technology, educators must be provided with adequate training. The training should be consistent and on-going to address the constantly changing technology available.

Inadequate technical support. If teachers feel that they do not have adequate technical support, they will be reluctant to fully implement technology. In addition to personnel to train and problem solve, the lack of technical support perceived by educators include "outdated hardware, lack of appropriate software, technical difficulties, and student skill levels" (Bauer and Kenton, 2005, p. 519).

Lack of time. Technology enabled learning can require more time for planning and implementation, especially in the first year of use. It is imperative that educators be given and take adequate time to incorporate technology into their classes properly.

Other barriers. In a recent qualitative survey conducted by the author, other noted barriers included (see Appendix B: Table 1.7):

- Money/budget
- Technology and software constantly changing or changing faster than training
- Low internet speed/bandwidth speed
- Limited access to power supplies
- Capped internet data access on campus
- Lack of access to cross-platforms and virtual platforms
- Discouraged use (especially of mobile devices and social media) by school administration
- Technology is seen as secondary by school administration

Part II- Education Technology Programs and Strategies

Choosing the Correct Education Technology. When trying to choose the correct technology for a course, it is important to keep two things in mind.

Goal of the course. The type of technology used depends on the goals of the course. For example, if the goal of the course is for the students to gain general knowledge of a topic, then exposure to wikis, video lectures, and online articles may be sufficient. However, if one of the goals of the course is to increase the students' ability to think critically, then technology that includes written analysis, problem solving activities, and multi-leveled tasks would be a better choice. Here are some areas to think about when aligning technology with the goals of the course:

- General knowledge
- Critical thinking
- Writing
- Communication
- Student directed learning

Which technology addresses the classroom goals. A recent survey taken by the author noted some educational technology that can be used in the classroom. Next to each technology item is a description of how it can be utilized in different areas.

Technical Requirements:

- Processor speed, amount of RAM and Internet connection speed can greatly affect performance and ability to run many education technology tools.
- Be sure you have downloaded and installed the latest browser versions and plug-ins such as Java, Flash, and Mozilla Firefox.
- Antivirus program, such as Norton or McAfee.

You may need to download additional (free) software to view course documents. Use the links below to download additional software and browser plug-ins if needed:

QuickTime Reader

Adobe Acrobat Reader

Real Media Player

Flash Plug-in

Type of Technology	Technology Utilization	Examples and Links
Audience Response System	Sometimes called Student Response Systems, this type of technology is used as an active learning strategy to increase participation. Students are able to answer anonymously, which makes even the less reluctant student, more willing to get actively involved.	iClicker Poll Everywhere Question Press Top Hat
Blogs	Yang (2016) conducted a study by creating a blog learning system to be utilized for content delivery, course facilitation, and as a means of communicating with students. The blog had a live chat, a reaction button to gauge student perception of the post, and other active links. The author concluded that it provided a teaching, cognitive, and social presence in the classroom.	EduBlog Weebly
Camtasia	The screen video software can be used in different capacities in the classroom. Stannard (2007) used the software for video commentary to provide students with feedback on essays. Biswas (2007) used the software for the capturing of screen writing. Through this method, the researcher was able to eliminate student distraction that resulted in copying materials from the blackboard.	Camtasia
Captivate	Yelinek, K., Tarnowski, L., Hannon, P., & Oliver, S. (2008) utilized Captivate in	Captivate

	an assignment for an instructional design class. The students were instructed to create an online tutorial using a MenuBuilder feature in Adobe Captivate. This feature links together different modules on one menu screen (Yelinek et al., 2008).	
Coding (PC and mobile)	Solomon (2015) noted that coding could be used in classrooms to teach programming skills as a self-directed and interactive learning activity.	Code Academy
Collaboration	Davis (2017) conducted a study showing that Google Docs was useful in providing feedback to students. Instead of the traditional red lines, teachers can provide electronic feedback and students can revise papers more efficiently.	Explain Everything Campus Press Google Docs
Jing	Jing is a program that allows users to give video and audio feedback on essays. This resource is free for videos that ae five miutes or less.	Jing
Kahoot	Kahoot can be used as an active learning technique to bring gamification into the classroom. Instructors can create and share quiz-based learning games, as well as use it for professional development training (PR, 2017).	Kahoot
Learning Management Systems (LMS)	LMS tools include discussion forums, online chat services, assessments, video conference, email and can be accessed at any time (Walker, Lindner, Murphrey & Dooley, 2016). The authors also noted how useful LMSs are in supporting teaching and learning (2016).	Canvas Moodle Blackboard
Microsoft Office	Office (Word, Powerpoint, Excel, Access) can be used to facilitate classroom learning. Powerpoint presentations can be created to display lectures on classroom projectors.	Microsoft Office
Podcasts	Bradbury (2016) notes that podcasts are audio or video media that can potentially reach the world. The author notes that podcasts are useful for storytelling, flipped classrooms, and for archiving previous class lessons (2016). It can also	Starting a Podcast

	be helpful to share experiences with students.	
Quizlet	Quizlet can be useful for study materials or to provide quizzes using the flash card method. Recently, Kolodny (2016) found it to be useful for team assignments by utilizing the app as team based learning through gaming. The author paired the students into teams and set up the quizzes to reflect a game show format (2016). It was a way to make the learning materials interactive and more engaging.	Quizlet
Social Networking	Crane (2012) explores a variety of ways that social networking can be implemented into the classrooms. She further explains useful exercises that can be used when incorporating social networking into assignments (2012).	Facebook Twitter Google Hangouts
Whiteboard (virtual)	This resource is often confused with the interactive whiteboards that are used in some classrooms. However, virtual whiteboards are different, in that it doesn't require any equipment other than occasionally installing an app. Some of the apps are free and require no monetary commitment. Virtual whiteboards can be used to collaborate with students. It is simply a way to write together. However, instead of the traditional whiteboard, you are drawing on a whiteboard that can be accessed through an internet or mobile connection.	BaiBoard ZiteBoard
Wiki	Wikis, web based free content that allows any user to edit and add information, can be used to create and monitor group projects (Robinson, 2006). Robinson noted further that Wikis can also be used by educators to build courseware and to help the students with development of papers (2006).	Zim Wiki Fandom

Part III- Helpful Resources

Making the Most of Education Technology. Even after educators have found the perfect technology for their class, they still must address the barriers listed earlier. Educators need training and support from their institutions, adequate hardware, and time and money to implement the technology effectively. While educators cannot change the culture of their institutions alone, they do have the power to increase their own learning and access to education technology.

Professional development. All educators must engage in professional development on a yearly basis. Educators who want to better incorporate technology into their classrooms can take advantage of professional development opportunities that focus specifically on this subject.

Access to technology. Many companies and foundations offer grants for educators. Taking the time to research and complete grant applications may seem daunting but the rewards in money, technology, and training are worth it.

Troubleshooting. Even with the best technology available, educators need ongoing training and support. Technology changes constantly and so does the culture of the classrooms. Just as students need connection to others to develop their learning, educators need connection with other educators for support and ideas for keeping their lessons relevant. Below are several resources created specifically for educators.

Reference	Description	Category **I** = Information and Ideas **S** = Technical support
Code Academy	If you want to learn how to code or bring coding into your classroom, this site is a very handy reference.	**I**
Illinois Online Network	This site offers resources and information regarding educational technology. It contains case studies, resources, and a blog with helpful information and support for instructors. It is also helpful for distance learning instructors.	**I, S**
TeacherCast	This site is a great professional development network. It is packed with information, tips, classroom kits, and even offers live webcasts and podcasts. The live broadcasts explore different education topics and are a great source of support. There is also an option to subscribe to weekly informational emails for free.	**I, S**
SAS Curriculum Pathways	Here is a resource that is geared toward curriculum in a variety of subjects. Most of their online resources can be accessed through a variety of learning management systems. This site is also accessible on mobile devices.	**I**
EduBlog	This site is a blog site for educational purposes. Users can create an educational blog and can also visit other blogs on a variety of educational topics.	**I**
Edutopia Professional Development Guide	This resource is a technology guide that includes workshop activities. It is very helpful for introducing technology into project based learning. It also has helpful videos and other resources to utilize.	**I, S**
Technology in Education Professional Development	This site is powered by the Virginia Department of Education. It provides a large amount of resources for those located inside and outside of Virginia and all at no cost. There is a section	**I, S**

	that gives outside resources and provides some very helpful information that is geared toward professional development.	
Office of Educational Technology	This reference is handy for those teachers transitioning to educational technology. It is the official governmental educational technology website and offers specific information.	**I, S**
Teacher Vision	This resource offers education technology tools and support for various grade levels. Aside from the education technology section, this site also boasts a wonderful amount of resources for educators.	**I, S**

Education Technology Shortcut List

Audience Response System

- iClicker
- Poll Everywhere
- Question Press
- Top Hat

Blogs

- EduBlog
- Weebly

Collaboration

- Explain Everything
- Campus Press
- Google Docs

Learning Management Systems (LMS)

- Canvas
- Moodle
- Blackboard

Whiteboard

- BaiBoard
- ZiteBoard

Wiki

- Zim Wiki
- Fandom

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CONCLUSION

Emphasis on technology use in the classroom is growing at a significant rate. Research indicates that education technology is utilized in different ways to increase student learning. While this study reveals associated barriers with the implementation of technology, there appears to be motivating factors within higher education instructors to try new approaches to learning. The findings show that faculty have a desire to incorporate some active learning strategies with the use of technology. The survey participants mention several programs and strategies that they would like to use in their classroom. However, indicated barriers appear to have prevented faculty from wholly embracing technology in their classrooms.

Overcoming the noted barriers will take some change management. As indicated in the results, the participants had the drive to utilize technology. The identified barriers posed a hindrance to teachers fully embracing and using technology in the classroom. It is important to identify the appropriate training and support that is needed. More importantly, the teachers and administrators must all be on one accord with the objectives for technology usage in the classes. If the overall goal of utilizing technology is to increase student learning, it is very important that proper training be conducted and the available resources be used to identify the needs of the organization.

Implications for Practice

Based on the results of this study, 75% of college and university educators world-wide use technology in their classrooms, although it is unclear of the extent of usage. However, lack of training and support are two of the noted barriers that was revealed in the findings. The results indicate that more educators would be open to utilizing technology if the proper technical

support was available to them when needed. This result indicates a need for more professional development and training programs. If an educational institution is headed toward the use of technology in classrooms, it is imperative that educators be properly trained to use the required software or hardware.

Proper Training

Effective training plays an essential role in technology acceptance for instructors. Without proper technology training, educators may not be able to efficiently utilize technology in their classrooms. When faced with the task of technology training, educational institutions may find themselves struggling with determining what constitutes proper training. Hepp, Fernandez, and Garcia (2015) noted that teacher training should be geared toward ensuring that instructors have digital competence. Instructors should be able to use the technology that is to be implemented in the classroom. Without technology training, instructors may be reluctant to utilize technology or it may result in the improper use of technology.

Professional development training programs are one of the most frequent training methods. Although initial training is a good start, on-going training is a key element in ensuring that instructors maintain the technological skills that are needed. Pool, Reitsma, and Mentz (2013) recommended that training programs be created to learn new knowledge, expand on what is already known, and integrate the knowledge into teaching practices. One initial training session isn't sufficient for an instructor who uses technology in a blended or active learning format. Therefore, it isn't logical to only have one development workshop for instructors who plan to fully incorporate technology as a regular part of their curriculum.

Professional development programs can be implemented in a number of ways. Training can take place in form of workshops, brown bag sessions (you bring your lunch while learning),

hands on faculty retreats, and lunch-and learn sessions (food provided while you train). However, adequate resources and proper support are very essential in making sure that instructors have that comfort level that is needed for the instructors to take advantage of the benefits of education technology. Therefore, it is important for relevant professional development programs to be made available for teachers to use technology in the classroom.

Training should not be limited to just teachers. Administrators play a significant role in effective teacher technology training. Whitworth and Chiu (2015) noted the missing link between professional development and administrators by noting that administrators are often the missing piece of the puzzle in professional development models. School leaders are instrumental in helping to lead change in technology training. While evidenced in this study, lack of support and training are noted barriers to technology acceptance. This area is where school leaders can play a pivotal role in advocating change for the organization.

Instructors are less likely to incorporate and effectively utilize technology if there is no support from school administrators. The advocate of change from school leaders isn't limited to just signing off on program development sessions. Support can come in the form of attending training sessions and mentoring and coaching. Whitworth and Chiu (2015) explained that school leaders' role in professional development includes taking an active role in planning and training. The authors noted that school leaders are an integral part of the puzzle and that professional development programs should extend to department administrators.

The researchers further emphasized a problem with leaders having short effective leader training workshops with little or no follow-ups (2015). If administrators aren't equipped to be effective leaders, it often transfers to leaders not knowing how to provide the needed support to

educators. This in turn, contributes to the noted "lack of support" barriers that were mentioned in the study.

Need for Instructional Design

Hepp, Fernandez, and Garcia (2015) pointed out the need for a technological handbook that offers resources that can be utilized in the classroom. While the handbook contained in this document will help many educators implement education technology in their classrooms, it cannot address the larger need for institution-wide training and support. Although it is often the norm in many organizations to have an IT (Information Technology) technical support department, they are often untrained in technology designed specifically for educational purposes. Therefore, it may be beneficial for the college or university to hire an Instructional Designer or an Instructional Technologist that can be a specific department's point of contact.

Instructional Designers are often trained and certified to equip an organization with knowledge of educational programs. They can also provide instructors with technical support specifically for education technology. Instructional Designers may be useful in helping instructors with ease of use and they can be imperative in assisting with perceived barriers. Katy, Richard, and Richard (2009) explained how instructional designers function in education environments. The authors noted that instructional designers are instrumental in being the change agents that help faculty think more critically about the needs of the learners with regards to information technologies. McGriff (2001) further emphasized the role of instructional designers by stressing that designers were critical to the success of faculty integrating technology and instructional methods that are innovative.

Although the roles vary, instructional designers have a place in higher education. Moskal (2012) noted that the instructional design needs in higher education are not the same as needs for

those in the business industry. The author further emphasized that the use of instructional design is more prevalent in schools that offer online courses for the study and stated that some institutions offered grants for faculty members who utilize online formats (2012).

Moskal provided research on different universities and how they utilize instructional design (2012). State Park University utilized instructional design to create online courses. As a result of this initiative, the university grew from 25 online courses to over 75 courses. After the university researched and saw that students were taking online courses and then transferring the credits back, they pushed for this instructional design initiative (Moskal, 2012).

Instructional designers should not be limited to just schools with only online courses. They are useful in blended learning environments and for schools that are looking to establish an online presence. Also, instructional designers can not only provide instructional design support for educational programs, but can also enhance faculty professional development and training programs. Often, instructional designers go beyond just course design work. Instructional designers can often be the missing puzzle piece to figuring out the right tools and skills for innovative online instruction.

Limitations

There were several limitations to this study. All data was collected through PollFish, a data collection company. The survey consisted of instructors with an unspecified amount of teaching experience. Therefore, the study would have benefitted from a more controlled population. The participants were from various schools from around the world. Although the survey was able to capture a diverse participant pool, it would have been interesting to see results from one specific educational organization.

An additional limitation was the sampling techniques utilized. Purposeful sampling was used to only target participants who were currently using or seeking to use technology in their classrooms. Therefore, this study does not represent educators who have no experience or no plans to use any form of technology in the classroom. Convenience sampling was a limitation for this study. The survey wasn't limited to one educational environment. Therefore, responses from instructors were gathered worldwide. The participant responses were self-reported and it was assumed by the researcher that the participants would answer open-ended questions with adequate responses.

Another limitation of the study was that it was a survey. Although the open-ended questions were helpful in identifying key barriers and perceptions, more information could have been gathered with interviews. An assumption was also made that faculty would draw from experiences with one educational environment. However, faculty could be employed in a full - time role and could also be employed as an adjunct faculty member. This provided a limitation on the data collection results. Although it is assumed that the participants would draw from one experience, it is a possibility that they would identify with multiple job experiences.

Based on the findings, most of the participants had some knowledge and use of education technology. However, some instructors may also hold administrative roles in addition to their teaching responsibilities. This limits their classroom time and could have affected the data. Although it is only speculation, it may be better to ensure that future studies are limited to full-time instructors when gathering faculty perceptions.

Recommendations for Future Research

It is recommended that further study is conducted in a more controlled population. There should also be a study conducted strictly on those educators who lack technology experience to

compare it with those who currently use technology regularly. This study could focus on investigating whether the use of technology increased after professional development trainings were implemented.

Student perceptions and barriers should also be addressed in a future study, possibly implementing the Technology Acceptance Model (TAM) as the foundation for the study. Further research is needed to show how education technology that is properly aligned with curriculum goals affects student achievement and student learning after it is implemented. The retention rates should also be studied to determine the benefits of education technology for that specific organization.

Lastly, it is recommended that the role of instructional designers in technology utilization be studied. It would be interesting to see if an organization is experiencing the same noted technological barriers if they have an instructional design team on staff. Although some of the barriers such as time management may still exist, the technological barriers would be interesting to study. Further, a comparison/contrast study looking at programs with a design team compared to those who don't utilize instructional designers would be an additional area worth studying.

Reflection

Although this study is not indicative of all of the associated barriers with technology acceptance, it does provide an understanding of some of the issues that surround the hesitance with embracing education technology in the classroom. The results do not indicate how the barriers have affected student achievement. However, there is a desire to promote more active learning strategies in the classroom. Ongoing training and professional development opportunities are necessary in utilizing technology. Training sessions should not be limited to a one-time workshop.

It is apparent that educational institutions will be headed in the direction of online learning for the immediate future. A clear assessment of needs should be determined in order to gather information on available resources and to properly examine the technological training needs for the organization.

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APPENDIX A: SURVEY

PLEASE ANSWER EACH QUESTION. YOUR RESPONSES SHOULD BE BASED ON YOUR EXPERIENCE IN YOUR CURRENT WORKPLACE. ALL SURVEY RESPONSES WILL BE ANONYMOUS AND WILL BE KEPT CONFIDENTIAL. THIS SURVEY IS FOR THE PURPOSE OF DATA COLLECTION FOR DISSERTATION RESEARCH. THE ESTIMATED TIME OF COMPLETION FOR THE SURVEY SHOULD BE LESS THAN 60 MINUTES. BY COMPLETING THIS SURVEY, YOU ARE CONSENTING FOR YOUR RESPONSES TO BE USED FOR RESEARCH PURPOSES ONLY. ONCE DATA HAS BEEN COLLECTED AND RESEARCH IS COMPLETE, THE RESPONSES WILL BE DESTROYED.

1. I currently utilize computer and technology resources in my classroom.

- o Strongly Disagree
- o Disagree
- o Neither Agree nor Disagree
- o Agree
- o Strongly Agree

2. I have adequate support to utilize technology in my classroom.

- o Strongly Disagree
- o Disagree
- o Neither Agree nor Disagree
- o Agree
- o Strongly Agree

3. Technology can enhance learning in my classroom.

- Strongly Disagree
- Disagree
- Neither Agree nor Disagree
- Agree
- Strongly Agree

4. I am interested in finding ways to incorporate technology into my curriculum.

- Strongly Disagree
- Disagree
- Neither Agree nor Disagree
- Agree
- Strongly Agree

5. I am interested in incorporating social software (blogs, Wikis, etc.) in my classroom.

- Strongly Disagree
- Disagree
- Neither Agree nor Disagree
- Agree
- Strongly Agree

6. Please indicate which educational technologies in which you are familiar.

- Microsoft Office (Word, Excel, Powerpoint, Access)
- Google Docs
- Podcasts
- Wiki
- Blogs (Wordpress, Tumblr, Weebly, etc.)
- Captivate
- Camtasia
- Storyline
- Social Networking
- LMS (Moodle, Blackboard, WebCT, Canvas, etc.)

Please indicate experience with other educational software or programs that you are currently familiar with.

7. Please rate your skill level with education technology (Excellent being highest).

- o Excellent
- o Good
- o Average
- o Below Average
- o Poor

8. I utilize education technology in the following ways:

- o Track Attendance
- o Active Learning
- o Grading
- o Lectures
- o I don't currently utilize education technology

9. Which statement identifies your technical level?

- o Expert
- o Novice
- o Limited experience
- o I just know how to turn computer on

10. Indicate the quality of technology at your school.

- o Excellent

- o Good
- o Fair
- o Needs improvement

11. Do you have any barriers associated with utilizing technology in your classroom?

- o Yes
- o No

If you selected "Yes", please identify any barriers below.

12. Would you utilize technology if adequate training and support were provided?

- o Yes
- o No
- o Maybe

If you selected "No" or "Maybe", please indicate your reasoning below.

13. How many years have you been teaching?

- o 1-5
- o 5-10
- o Over 10 years

14. Do you see value in utilizing mobile technology in the classroom?

- o Yes
- o No

If you stated "No", please indicate why.

15. Do you feel that technology enabled learning should be a part of student learning?

- o Yes
- o No

If you selected "No", please explain why.

APPENDIX B: DATA TABLES

Table 1.1 Demographics

- Gender
  - 190 females – 47%
  - 210 males – 53%

Number of Completion	Age	Gender
130 (35%)	18-24 years old	58% males 42% females
134 (33.5%)	25-34 years old	50% males 50% females
81 (18.75%)	35-44 years old	51% males 49% females
41 (9.5%)	45-54 years old	41% males 59% females
14 (3.25%)	55+ years old	64% males 36% females

Table 1.2 Years Taught

1-5 years	39.5 %
5-10 years	22.75%
10+ years	21.25%
Less than a year or part time	16.5%

Table 1.3 Comfort with technology in general

Q2. I currently utilize computer and technology resources in my classroom
o 73% agree and strongly agree
o 15 % disagree and strongly disagree
o 11.5% neutral
o No significant difference between males and females
o 45-54 years old have highest use
o 55+ have lowest use
Q10. Which statement identifies your technical level?
o 75% consider selves expert or novice (some expertise)
o 19.75% have limited expertise
o 5.25% no expertise
o Males indicate more expertise than females by a small margin – 79% vs 71%
Q11. Indicate the quality of technology at your school
o 78.75% indicate excellent or good
o 15.75% indicate fair
o 5.50% indicate poor
o No significant difference in perception based on age or gender
Q13. Would you utilize technology if adequate training and support were provided?
o 73.50% said yes
o 22% said no
o 4.5% said maybe

Table 1.4 Comfort with educational technology, specifically

Q8. Please rate your skill level with **education** technology
o 74.25% below average or poor
o 25.75% average to excellent
o No significant difference based on age or gender
o Direct opposite of their comfort level with technology in general
Q9. I utilize education technology in the following ways (multiple selection)
o Administration (attendance and grading) – 57.5%
o Active learning – 37.8%
o Lectures – 7%
o None – 4.6%
o No significant difference based on age or gender
Q5. I am interested in finding ways to incorporate technology into my **curriculum**
o 76.5% agree or strongly agree
o 13.25% disagree or strongly disagree
o 10.25% neutral

o No significant difference based on gender
o 25-54 year olds highest interest
o 18-25 and 55+ year olds lowest interest
Q6. I am interested in incorporating social software (blogs, wikis, etc) in my classroom
o 64% agree or strongly agree
o 18% disagree or strongly disagree
o 18% neutral
o No significant difference based on gender
o 25-54 year olds highest interest – though less than Q5
o 18-25 and 55+ lowest interest
Q7. Please indicate which educational technologies you are familiar with (multiple selection)
o Microsoft Office – 20.54%
o Google Docs – 18.11%
o Social Networking – 16.22%
o Wikis – 14.41%
o Blogs – 10.99%
o Podcasts – 6.49%
o Learning Management Systems (LMS) – 5.23%
o Storyline – 3.15%
o Camtasia – 2.43%
o Captivate – 1.26%
o Other – 1.17%
▪ Kahoot
▪ Quizlet
▪ Web-based Edmodo
▪ Winmat
▪ Canaima
▪ Wingeo
▪ Visual Studio
▪ Visual C++
▪ Proteus
▪ Javascript
▪ Coding (PC and mobile)
▪ Mathlab
o No significant difference based on gender or age
Conclusions based on results
o While a large number of respondents see value in using educational technology, very few are familiar with the types of technology available and how to incorporate into their curriculum
o There is a great need for training in this area

Table 1.5 Perceptions regarding technology usage

Q16. Do you feel that technology enabled learning should be a part of student learning?
o 95.75% said yes
o 4.25% said no
Q15. Do you see the value in utilizing **mobile** technology in the classroom?
o 89.5% said yes
o 10.5% said no
o Based on written responses, the respondents prefer the computer to mobile devices because mobile devices can be distracting and difficult to control
o "Mobile technology gives bad habits to students in their learning progress. Sometimes it is useful but not always."
o "Mobile technology is very important to have channels to communicate with others more than use in the classroom."
Q4. Technology can enhance learning in **my** classroom.
o 78.5% agree or strongly agree
o 13.5% disagree or strongly disagree
o 8 % neutral
o No significant difference based on gender
o 45-54 year olds had highest response – 88%

Table 1.6 Access to Technology

Q11. Indicate the quality of technology at your school
o 78.75% indicate excellent or good
o 15.75% indicate fair
o 5.50% indicate poor
o No significant difference in perception based on age or gender

Table. 1.7 Barriers

Common barriers listed
o Money/budget
o Low internet speed/bandwith speed
o Limited access to power supplies
o Capped internet data access on campus
o Lack of access to cross-platforms and virtual platforms
o Discouraged use (especially of mobile devices and social media) by school administration

	o Technology and software constantly changing or changing faster than training
	o Technology seen as secondary by school administration