



**THE IMPACT OF DIGITAL
TECHNOLOGY ON LEARNING FOR
GRADUATE STUDENTS IN A LARGE
MID-WEST UNIVERSITY**

A Research Project Presented to

Dr. Alex Jean-Charles

Missouri State University

In partial fulfillment of EDT 798 and

Requirements for the degree

Master of Science in Education -Educational Technology

By

Sarah Alkediwi

May 2016

ABSTRACT

Technology in the classroom has a much longer history than most assume. The use of devices and learning programs began to emerge fully with the discovery and mass availability of electricity. Using the devices, software, and systems college students and teachers can enhance engagement, collaboration and comprehension. The study researched the impact of digital technology on learning for college students. The purpose of the research was to gather data from current graduate students using digital technology in their courses. This quantitative study surveyed 329 enrolled students at a large Mid-Western University. The data was gathered using the student email, and was processed through a commercial survey web service. The study resulted in data indicating college students embrace digital technology in their courses and have skills in this area prior to enrolling at the University. Some of the other findings showed the use of digital technology in college learning has a solid future in educational systems in this country. The implications of this research included the impact of digital technology on student, collaboration, engagement and comprehension.

Keywords: Multi-media, Mobile devices, Social media, Education, Digital Technology.

Chapter One

Overview of the Study

The use of technology by students enrolled in colleges and universities are increasing daily (Amirault, 2015). This research examines the history and current impact of using technology, including mobile devices, social media and multi-media in the classroom. Studies provided data showing the levels of engagement, collaboration and comprehension after the use of technology on campus. The research showed an increased in level of motivation among students in seated courses and those enrolled in online classes (Fessler, 2009).

In order to fully appreciate the progression of technology into modern education, sources are included describing the history and importance of this developing industry. Holmberg (2005) stated this began when classrooms became warm, bright places to go to learn, using materials suddenly being mass produced and available to more students. This history is important to consider when discussing how advanced and available educational technology is today.

Educational technology is far more than just a tablet or projector used in college studies. This industry provides more than just wired and wireless capability, such as mobile devices; it includes software programs, multi-

media systems, and even complete courses for virtual learners. Amirault (2015) defined technology in the classroom as including, but not limited to all hardware, programs, and networks Internet, used in communication among faculty and students. This represents all computers, televisions and mobile devices.

Rationale for the Study

A review was needed about the current trends on college campuses with the increased use of digital technology, mobile devices and multi-media systems and social media in education. Universities were extremely interested in the engagement, collaboration, comprehension and success of their growing enrolled populations. Among these students were increased segments of distance learners, online students and those attending the popular branch locations of universities.

This study addressed how technology impacted the college student, and this related directly to the success and growth of future university degrees and programs. Schools reported increased student populations on the physical campus as well as the fast growing number of students learning online. Technology played a vital role in both coursework and administration. This study examined the possibilities for the future of

technology and advancing social and multi-media systems used in college learning.

Purpose of the Study

The purpose of the study was to examine the impact of digital technology on graduate level college students. This also included a review of sample results on student use of digital technology and if it enhanced learning, collaboration, engagement, and comprehension. Sources include the results of comprehensive surveys on the campuses of major universities testing student's engagement, and collaboration using the advanced technologies (Chapter II). These surveys gave details on the impact of digital technology as it affected the student's ability to learn and then achieve successful grades. This advancement also enhanced student retention for schools and promoted the success of students to complete their degree programs.

Research Questions

Exploration into this topic was conducted building on three main questions:

1. Does the use of digital technology measurably enhance learning collaboration?
2. Does the use of digital technology measurably enhance learning engagement?

3. Does the use of digital technology measurably enhance learning comprehension?

Research Design

A survey design was carefully composed to address the purpose of the study. In the questionnaire, the framework was designed to make the best use of complete anonymity to ensure results were honest and fair among all students. The survey used was a set of comprehensive questions sent to all students enrolled at Missouri State University. This approach was the most direct and would supply the general opinions of the students using digital technology in college learning. This design guaranteed data returned from a section of all races, ethnicities and other student statuses would best represent technology use on campus. The responses were analyzed and any trends among those participating were discussed in a narrative form. This narrative was useful to forecast the need of students for technology additions in all departments and assisted instructors to learn the full impact of digital technology on graduate students enrolled at Missouri State University.

Significance of the Study

The results of the study indicated how widespread the use of

advancing technologies and programs such as social media and multi-media systems had become among Missouri State University students. The data provided details about the attitudes of teachers and students toward the enhancement of lessons using personal devices, social websites and its impact on learning. This research was timely and critical due to college students enrolling in studies in many countries other than their own. The results of this research showed that great importance should be placed on the training of both students and instructors on the most advanced educational systems. Technology allowed instructors to utilize such programs as software that simulated many forms or operations from multiple industries. This benefit again increased motivation and engagement among students. The sources showed some students felt uncomfortable making presentations in class, but created assignments using multi-media technology; additionally, students reported higher levels of engagement and less academic boredom from lack of challenges (Ercan, 2014).

Definition of Terms

1. Mobile Device: any movable wired or wireless device including, but not limited to iPad, iPod, Kindle, Nook, laptop computers, cameras, and cellular phones (Gallup et al., 2015).
2. Multi-Media include all audio-visual learning programs, software and

- devices providing video, music, movable displays, interactive technologies and resources (Crappell et al., 2015).
3. Social Media includes websites such as Facebook, Wiki Space, Twitter, You Tube, My Space, Snapchat, Instagram and others (Carr & Hayes, 2015).
 4. Digital Technology for the purpose of this research includes but is not limited to cellular phones, personal computers, e-readers, tablets and all software and programs containing audiovisual components and use of Internet (Dean, 2015).

Chapter Two

Literature Review

The purpose of this study is to examine the impact of digital technology on graduate level college students. This literature review is divided into five main topics: (a) history of technology in learning, and continued development (b) the progress and importance of learning technology, (c) digital technology enhances learning collaboration, (d) digital technology enhance learning engagement, (e) digital technology helps students understanding content

History of Technology in Learning and Continued Development

Technology has impacted how different tasks of organizations are completed, how employees perform in an effective and timely manner, and it has also brought numerous advantages for students. Internet tools and social media enhance different activities among students such as information sharing and collaboration, both of which are considered essential to develop association of students with other members of the society. New and advanced levels of technology are utilized by students in academics that promote engagement of students with each other and facilitates them to develop an effective pattern of learning. Because the engagement of students with technology represents effort and time that is invested in

educational and collaborative activities, it is often associated with positive outcomes of learning through which desired objectives can be achieved such as individual development of students and critical thinking, as reported by Gourlay (2014).

Gourlay (2014) determined the effect of technology on the quality of education and the use of the products, resources, opportunities, and devices available today. She believes this causes some educators to question if students are depending on the device to gather the information and provide the answers. Prior to the utilization the new devices, learning was more physical, causing students to search through books for information. In fairness, not all students possessed the same number or quality of books and research materials. The study, Gourlay (2014) continued, determined that students believe books and papers to be obsolete. The data was gathered through survey by Gourlay (2014) and involved an unspecified number of post-graduate students in England. The survey gathered information about the use of their devices and multi-media platforms while in school. The results showed students continued engagement with technology at higher education levels.

Kaye (1989) contends this advancement of technology demanded students not only learn about it, but also learn how to use it, enhance it, and

develop future forms and uses for it. Teachers in the past few decades were required to quickly become proficient with the technology to keep pace with its presence in the classroom. Most college students today possess technology upon entering the campus, which alters how students learn and where learning occurs. The impact of technology has changed the relationship of the college with the student, their education, and the teacher.

According to Kaye (1989), the most recent technologies and the basic systems will blend to create fast multi-functional and expandable devices. This expansion will connect with future equipment and databases, such as those used in the colleges and business. In the future, Kaye predicts, all systems will provide networks for global use and personal access. These stand-alone elements include, for example, Computer Assisted Learning (CAL) hypertext, audio, video and others to create devices and build for the new systems capable of multiple functions such as interactive media and hypermedia. Delgado (2012) discussed how the foundation of education was to teach the young about the world around them, the past and present, while challenging them to be productive in their lives and contribute to a better future. This idea involved the conveying of information from the teacher to the student. Today's college student enters the classroom carrying personal technology devices containing the large amounts of information

and research easily used. Delgado suggested that with the technology and information already in possession by the students, all educators must see that the technology is needed to prepare students for their career.

Research conducted by Jenkins, Browne, Walker and Hewitt (2009) produced results encouraging the use of enhanced learning devices and technologies to meet cultural acceptance of these advancements in schools. In the study, 164 college institutions were asked to respond with data about technology use among students currently enrolled. A total of 74 responses were recorded and revealed 45 % of students actively approved the use of devices and technology in the curriculum compared to 41 % in 2005. Previously, information and tools for teaching came from the schools and the teachers into the homes and daily lives of the students.

The Progress and the Importance of Learning Technology

Today, after the creation of the Internet and the World Wide Web, students bring personal means for moving information with them from home and daily life. Teachers in the past 20 to 30 years found it necessary to embrace and learn to use the new technologies to have success instructing their students, as described by Fessler (2009). He predicted that in the next 25 years all educators must accept and learn to use the technologies in classrooms. Newly graduated instructors became part of the history of

technology and its uses in the modern classroom, as they were in the forefront of the times.

A college student or teacher could just as easily have made this observation from an earlier decade, such as when the first electric typewriter appeared in the classroom. Alternatively, it could describe widespread use of the manual model, for that matter. Progress included automation and moving parts as well as new discoveries in science and other areas of daily life. Describing progress, Oak (2012) stated, “At the heart of every piece of technology is automation. Technology automates the most complex of processes, be it communications, education, medicine or any other industry” (para. 13). This comment is relevant to the use of tablets and smart phones and laptop devices in modern classrooms. These improvements have become today’s books and papers, the teaching and study materials of modern education. Jones (2009) discussed the far-reaching effect of technology on college students by discussing how the books, papers, and classrooms of the past became the distance learning and technology-mediated learning of the present. He pointed out that distance learning may have had its origins in the correspondence schools as far back as 1728 and 1833. Students then used the postal service to interact with educators so the classroom was, therefore, virtual. Jones further stated that based on

research, as early as 1909, an infant form of video teaching already existed. Instructors shared charts and pictures from museums and developed these efforts further with the new technologies such as radio, telephones, and television.

Technology is important today to produce goods, to move information globally and locally, to track data, to perform surgery, to control transportation, and the list continues to grow. Shu-Ling (2000) suggested that traditional concepts transfer easily to students who are now taught with color, video, sound and almost a television production quality surrounding the presentation, which changes the reception of the material by the student. Medical and scientific procedures, for example, are much more fascinating in video than plain printed charts requiring memorization.

Hutinger (1996) discussed how the impaired student or teacher could use innovative technologies designed to bypass or completely override the disability. This assistive technology category remains crucial to the education and creative opportunity for the impaired. Because research and development is at the heart of education, this allows them active participation in the advancements. Hutinger stated the new technologies create important avenues for all challenged students to pursue higher education.

Dwyer (1994) stated the movement of technology forward changes the way teachers use the hardware and programs in the classroom. Teachers will not only expect students to learn material, but both parties will face the challenge of learning the technologies. For successful students at any level to achieve their goals, they must interact with the material, the teacher and the technology. This, according to Dwyer (1994), created a learning structure focused on the learner's needs and not the material. Since the onset of technology in the college classroom, and the development of the virtual classroom, changes have occurred that some experts believe place the student and the technology in charge of the lessons and the way in which learning happens. Some of these academics, such as Kirkwood and Price (2012), warned that students may be engaged with the technologies for their education, research, and problem solving more often than with the instructor and books. Kirkwood and Price showed new technologies in the hands of college students created learning that is not accomplished in a scholarly way. They believed the importance of the technologies in education especially for the college student, has been tested and shown to be effective, popular, and here to stay.

Digital Technology Enhances Learning Collaboration

The use of social media allows students to work collaboratively on

assignments, create, and submit work to one person in a group or to all members of the group at the same time. This sharing of assignments, research, or entire projects is another connection brought about by the use of social media by college students. Members can correct, change, and view their work from almost any location and on their personal devices. As discussed by Kaplan and Haenlein (2010), "Compared to regular websites, social media are in particular applications that offer a multitude of different ways for people to work together" (p. 62). The term used to describe all social media in the college environment is collaborative tools and these formats such as Wiki, blogs, Twitter and others have become exactly that. These are interactive spaces on the web allow college learners the option to engage with not only the teacher, but also the material and other students often in real-time. It has a sense of freedom to the learning of subjects not seen before, including the collaboration aspect that also allows the group to create projects and presentations displaying and sharing what they have learned. This collaboration in the virtual space appeals to college students and gives hands-on abilities as they learn. According to Junco, Heiberger, and Loken (2011) there are benefits and emerging uses for blogs such as Twitter in the college student's coursework. These networks include Twitter and social media platforms allowed students to collaborate effectively with

one another and engaged others with a media they used in daily life.

Voorn and Kommers (2013) presented evidence from a study involving 233 college students to view how social media affects the engagement in learning. The data collected indicated that social media sites provide ways for the shy or introverted student to engage as fully with the other students in a group project as those with more outgoing personalities. Voorn and Kommers further discussed the use of the media as a way to empower students and build their self-confidence. The future of their idea may show the benefit to the student who is international and learning in dual languages. The technologies that make social media accessible assist these college students in ways that a traditional classroom cannot. Language barriers are somewhat lifted in the virtual world. Voorn and Kommers' data and data analysis indicated that students have come to expect to use the social media in their college coursework, initiated by the teachers in addition to traditional, constructivist methods of the past. Voorn and Kommers recommended institutions use more social media to benefit the student population.

Tay and Allen (2011) conducted a study among a unit of undergraduate students with 205 participants who were asked to use social media in a selection of courses so the resulting collaborations could be

reviewed. The goal of the study was to move for curriculum reform in the university level allowing social media to be used in larger amounts of course work. This study provided insight into the methods of teachers bringing collaboration platforms into the class such as Twitter, YouTube and others, allowing the students to recognize these tools as collaborative. The use of YouTube specifically allowed both educators and college students to create video of processes or view procedures and the information being taught in visual and audio format. Students recognized all of these sites as highly interactive; however, they did not consider them as tools to partially preserve the constructivist foundation of a college education. Preserving the older, more scholarly aspect of education falls somewhat to the side as the use of the blogs and social sites increased among students (Tay & Allen).

Greenhow, Robelia, and Hughes (2009) published an extensive review of research on the future directions of Internet use and learning in the United States. This report included two important ideas revealed in their findings: The authors reveal learner participation and creativity in addition to online identity formation would drive future use of the Internet as a research tool for students. The study shows the Internet allowed them to become interactive; media focused, and increased their creative skills that in turn increased their level of engagement.

McLoughlin and Lee (2010) stated that the students who learn using technology must include those college students who are studying to become teachers. McLoughlin and Lee believe that by using the collaborative tools and web services available during their own education, they will ultimately move their outlook as teachers into the technology driven world. These students and future teachers will be trained in using technology to motivate, engage, and encourage their students to work collaboratively. McLoughlin and Lee's research, which involved instructors and students in eight universities, sought to review the changes required for students and instructors to embrace technology for learning and assessment away from the traditional classroom. The results indicated that by blending the attitude of a social media user and students with the skill of the teacher, this combination would prepare all who come later for the emerging technologies. McLoughlin and Lee's idea is central to college students completely engaged with each other, networks, teachers, and all study groups in order to learn more successfully.

Herrington and Parker (2013) presented findings after reviewing student use of emerging technologies in higher learning following a survey of institutions in the United Kingdom. This took place in a two-year study, the first using 271 institutions and the second 326. The surveys showed

“Students can be supported to take responsibility for their learning through scaffolding and guidance for a significant task, rather than direct instructions on lesser activities” (Herrington & Parker, p. 607). This study indicated the emergence of group work as assigned at the college level promoted students working together to research and create lessons using the technology and the collaborative tools available through social media sites. Students were allowed to work using these tools that involved audio, visual and other learning enhancements in addition to the social atmosphere they enjoy away from classes. Herrington and Parker found that social media was a collaborative method that encouraged students to become more self-directed learners. This is a large difference from the traditional method in which students followed strict guidelines and were required to produce expected results. From the advances in the technologies and their connection to the web and various social media outlets, both students and students as future educators are contributing to the increase of collaboration.

Digital Technology Enhances Learning Engagement

Brett (2011) conducted a study to evaluate students’ engagement with Short Message Service (SMS) or text. This experiment was to determine how students would participate and engage in the use of a mobile device for the use of communication. The project used 42 university students and staff.

The experiment also took in consideration that the use of mobile devices for communication had become a normal event for higher education students. With this in mind, it was believed that students would welcome the idea of using their mobile devices to communicate within the classroom. Three different types of texts were created in the classroom. The first type of text was a push text, which is any text 640 characters long, which is four times the length of a standard text, allowing information to be shared via text without the need to reply back, such as class confirmation time and assignment reminders. The second type of text created was formative assessment with feedback, which provided students with a question and the instructions on how to reply back. The third type of text was a conference group where the teacher created a topic and students were allowed to share information back and forth. Overall, the results showed the majority of students practiced the use of mobile devices. Some of the issues were cost; students did not want to use their mobile devices, and inconvenient schedule when the texts were sent. Data was gathered and the study showed that students did welcome the idea of using mobile devices once some of those issues were resolved. This enforced the thought of students using their mobile devices for learning purposes and communication (Brett).

Results from the study by Brett (2011) indicated the use of technology

in the classroom has been increasing every year. Teachers have been looking for new and creative ways to make their students learn ever since schools were able to implement technology in the classroom. The use of different technology has been evaluated and results have shown different technology can be linked or preferred by different age groups and different learning experiences (Brett).

Gikas and Grant (2013) conducted a qualitative survey of three American universities to study the levels of student success using cell phones and other devices in higher learning. The study utilized students at three universities across the United States. The goal was to report the views of the students on social and individual programs and the effect on their success in the class work. The data showed favorable grades with the use of technology and the instructors and universities wanted to continue to implement the use of mobile devices in higher education by engaging in social media. Results showed students had more interest because they could collaborate interactively. The fact that this resource was available to students anytime they wanted made it easy for students to continue and improve the use of mobile devices in their classroom. It was seen that students enjoy having easy access to information when it is quickly at their disposal. It increased students' interest and allowed for better learning

experiences because information not known by students could easily be learned (Gikas & Grant).

Hwang, Shi, and Chu (2011) conducted a study to investigate the use of hand-held devices to engage students in learning utilizing an experimental group and a control group to compare data. In China, 70 students in high school were divided into two groups. Students were to study inside a temple during a tour and participate in testing at the end of the tour. The control group was given a human tour guide who guided them and provided information to the students. The experimental group consisted of students who were given a personal digital assistant (PDA). The PDA would ask students to stop at different locations and answer questions about the information given to them based on the location. If students answered correctly, they were allowed to proceed to the next location. However, if students did not answer questions correctly, the PDA would inform them and give additional information on where to find needed facts. This study showed students engaging in learning by the use of PDAs. The results showed that learning and interest to learn was spiked when students were given the option to use the PDAs. It seemed that students enjoyed working at their own pace because the PDA would also provide any additional information that they did not fully understand the first time. Students in the

control group were only given the option of a human tour guide who did not give them information right away. Learning was provided at the tour guide and other students' pace. It was also shown that students in the control group were not as engaged in learning the information because they had to follow a group and the information was not given in an interesting and engaging manner. This particular study claimed that students are easily impressed and engaged in gadgets and new technology. This can be implemented at all education levels because it shows that students tend to do better at learning when they are given an open window of time to complete a learning activity. It also indicated that students learn better when they are provided additional information and tips when a learning activity is not fully understood by the student (Hwang et al.).

Tzu-Chien, Yi-Chun, and Paas (2013) conducted a study using 74 students in high school during which technology was used along with real physical objects. A mobile device was used along with plants for learning purposes. Before the study began, 18 months of learning about plant science occurred. The mobile device provided additional information and pictures in regards to the physical plant given. The device programs contained line and arrow cues on the screen pointing to various parts of the plant with additional learning information. Tzu-Chien et al. found using data and data

analysis that the students were engaged with the cues and appreciated the ability to learn from both the device and the physical plant.

In Taiwan, Gwo, Po, Ya, and Yueh (2013) conducted a study with 51 middle school students who were separated into a control group and an experimental group in order to study the combination of inquiry-based learning with mobile learning. According to Gwo et al., (2013) “[they] attempt to integrate field study into the inquiry-based mobile learning model; moreover, a mobile learning environment that allows students to access both physical and virtual resources is developed accordingly” (p. 338). This field study described the way results can be used to combine learning materials such as science experiments, or artwork, with the mobile devices. One group used live examples of plants to answer a questionnaire while the other group worked from a device using a software application. This is a growing form of multi-media mobile educational platform. The research of Gwo et al. showed that the use of technology had enforced learning. Their study revealed that students’ engagement to learn had also increased by providing mobile devices and additional technology to conduct a variety of learning activities. They stated motivation can be enhanced at any age but the adequate technology has to be provided to the appropriate age group. It was easier and less costly for an educator to encourage the use

of technology (Gwo et al.).

Digital Technology Helps Students Understanding Content

Teachers and schools have been more encouraging and welcoming about students using different devices to retain knowledge. The latest devices and technologies are user friendly, and fit the needs of most classrooms perfectly. Multimedia learning works well in traditional classes and the popular online learning environments (Ciampa, 2013).

Ciampa (2013) conducted a case study to evaluate the usage of tablets with students. He gathered data in different areas in order to observe the process of learning and how knowledge is acquired through the use of multimedia present. Ciampa used a single-case study with six grade school learners and their six teachers during regular classwork. He compared the engagement and motivation to that of the learners using traditional methods. One of the things that Ciampa observed was the increase in cooperation from students using the tablets. It also improved students' motivation by trying to complete the tasks assigned pertaining to the multimedia. Students were observed performing diverse activities that would otherwise not be performed if taught the traditional way. Another interesting observation gathered was the fact that students were more motivated when the tablets would provide quizzes or tests at the end of a learning section. The teachers

found students retained more information and interest in the quizzes because tablets provided instant feedback (Ciampa).

Ercan (2014) said many subjects at all educational levels worked well when enhanced with the variety of effects present in multimedia programs. Science, art and other lessons become visual, with motion, sound, and interactive designs. For example, he claimed in his study students could design art projects within painting platforms, while engineering students can build virtual buildings in their system. These were exciting additions for the learner and produced high motivation. In his study the tools used were an achievement test and a science attitude section. The subjects of the research were 62 middle school students, who used multi-media and were evaluated on their level of learning in a scientific setting. Some of the results that were found proved that students were more interested in learning about science because science usually provides hands-on activities and other methods of learning. It was also stated that most students were more willing to use technology and had a positive attitude towards it than past generations. It was within reason that instructors should take new learning methods into consideration and introduces more multimedia and hands-on activities to be used for leaning purposes. Otherwise, the newer generation of students will tends to get bored with older, more traditional methods.

Gotsick and Gotsick (1996) published their paper discussing strategies for integrating and setting up multimedia presentation equipment in the classrooms, locating resources, and addressed possible problems that could affect the end user. The purpose was to evaluate how multimedia technology impacted learning development and new methods to communicate information to learners. “Developing classroom presentation can provide both the skills and the confidence to enable individual faculty to expand the role of multimedia in the psychology curriculum” (p. 292). Some other skills learned in this study were motivation, critical thinking, and understanding a topic. At the end of all modules, a quiz section was created to test the students’ knowledge. This allowed students to engage along with other students in solving the problems and activities together. Results showed students’ motivation in doing the project was much higher and they experienced a greater level of confidence using new and interesting multimedia.

Neo and Neo (2013) conducted their study at the Multi-Media University of Malaysia using 53-second year students over a 14-week timeframe. At the end of the interactive classwork and testing, 85% attained a reliable learning score. When student participants replied to an exit quiz on the experience, the same 85% responded that they felt more motivated

and the learning was fun. This exercise returned impressive data showing students wanted to learn and engage with multimedia in order to share their thoughts and ideas in a real-time, collaborative program. During the study, the learners achieved higher motivation and would even attempt projects of greater difficulty when working with the enhancements. As stated by Neo and Neo, “Students require a platform to share and exchange their ideas and create a community to solve their problem collaboratively and to facilitate and foster communities of learners” (p. 256).

Another study was designed to introduce iPad mobile learning in higher education by Hargis, Cavanaugh, Kamali, and Soto (2014). This study involved 450 participants and 68 presenters through 51 sessions to integrate iPad technology into classes. The project preparation was extensive because training had to be provided to staff in order for iPad learning to be introduced to students. The university introduced the iPad to students by organizing conferences around campus that would bring faculty members out to engage students in what they had already learned from the iPad activities. Once the program was integrated in higher education classrooms, students and teachers noticed a difference in the way they were learning. Teachers were engaged because they were able to create new lessons and learning techniques that would increase student interaction. This

study confirmed the prediction that iPad has the ability to change learning and teaching in higher education and allowed students to evolve with the advancement of the technology. Studies such as those presented here offered evidence that the future for integrating iPad devices and programs into higher education will benefit both students and teachers.

Chapter Three

Methodology

In order to retrieve the best results from the survey design, the methodology included in depth probing questions related to the purpose of the research, the impact technology use had on college learning.

Development of suitable survey questions allowing the students to answer honestly and comfortably, no matter the individual circumstance was critical to achieve useful results. The method and design met a high standard when questions were chosen, so that “strongly disagree” met the student’s level of ethics, understanding and background. Well-planned survey questions were the best method in order to reach the greatest number of graduate students enrolled at Missouri State University.

Research Design

The format of this research was a narrative analysis describing the tabulated results gathered by a Quantitative Study. Participants engaged in Survey Research so the director of the study was unbiased and not in contact with the students. The design allowed for the questionnaires to reach the students through university email, and protected the confidentiality of the study and the personal identity of students involved. This research design was a Cross-Sectional Survey conducted once (Gay, Mill, & Airasian,

2012).

Site of the Study

Research began at a large university in the Midwest, through registered student email accounts of enrolled students. This university is in the third largest city in the state, among other satellite branches. In 2015-2016, the estimated enrollment was 21,000 students from all over the United States and many other countries.

Participants

The research was directed to a target sample of 329 enrolled graduate students attending Missouri State University. The participants represent 10% of the 3,299 graduate student population. This study was completely voluntary and identity information was protected and not used for other purposes. The data received was independently tabulated and analyzed by a survey service. The trends, impacts and frequencies were reviewed through an online professional service. The researcher was not a participant in the study.

Chapter Four

Findings and Analysis

The purpose of the study was to examine the impact of digital technology on graduate level college students. During the data collection process, the participants answered to the survey questions that were used to provide data for the study. Multiple open-ended questions were provided to each student with the addition of space to share their experiences using digital technology in classes. This survey research provided input to universities and the digital learning industries on the basis of data gathered and the results and recommendations formed. Results in the research emerged from three basic questions asked of each participant:

1. Please indicate your gender.
2. What is your age?
3. How many years have you been using digital technology in your learning?

The survey sent by email contained 11 questions created to gather data from each participant on their use of digital technology in classes. Additionally, the survey used three open-ended questions to gain a

qualitative perspective if the student chose to answer. A total of 97 responses were received from the survey.

Conclusions and Recommendations

The purpose of the research study was to examine the impact of digital technology on learning for graduate college students. The project intended to also provide data that was both qualitative and quantitative in order to produce a complete view of the participants ability to collaborate, engage and understand. The study was conducted with students attending a large Mid-West university, studying at the graduate level.

Summary Discussion of Findings

The impact of digital technology on learning for college graduate students is significant and growing, as shown in the study using data collected by survey. Results gathered from 97 student responses revealed over 60% of those students did not feel their use of digital technology was limited. The schools and universities have allocated billions of dollars for the use of digital technology in teaching and learning and the industry has arrived (Kiernan, 2006). The survey showed almost one-half of the student participants preferred classes with digital technology. Other high percentages were recorded in areas regarding the convenience, efficiency

and increased degree in comprehension as expected. The survey supported the growing trend among students using digital technology in online and distance learning at a rate in excess of 45% not preferring traditional classes without it. The survey consisted of results such as the number of students responding contained 83 females and 14 males. The research was not designed with questions to discover why the majority of responses were female. This indicated that of the 97 total responses more than 80% were female in gender. The category regarding the use of social media and mobile devices seemed linked by the closely split and unexpected result. The students surveyed a 29% support of this use while 17.24% chose to remain neutral. This was not the only high instance of neutral data gathered. Questions on the degree of distraction caused by digital technology in class showed over 41% felt no impact on their work while another high neutral response rate at almost 25% affected the result. This supports the high percentages of students who did not feel digital technology created a distraction while they were learning. This data also indicated the students attend classes using traditional methods or using digital technology and simply comply with and use the tools required by the instructor for the course. In other words, unless they did not understand the question, they simply chose not to answer either for or against.

Recommendations and Final Thoughts

This study on the impact of digital technology on learning among graduate level college students collected survey data from 97 enrolled individuals. Almost 80% of the students surveyed fully supported the use of digital technology as opposed to traditional classes. The university at which these students are enrolled utilizes the most modern equipment and programs including a highly trained IT department. The personal comments students left in the space provided showed widespread support of digital technology because of convenience, efficiency and aid to comprehension. Even students who expressed disliking digital technology in their comment supported the use by their peers. This research project showed the need for further study in two main areas, the use of mobile devices in college classes and the use of social media in college class work. The students gave extremely high neutral response rates to these two questions. With the exception of this lack of data from the participants, the overall findings in the study showed the impact of digital technology on their learning is high. Universities provide classes using both traditional and technical methods for all types of learning and the digital technology is the basis for all online learning. The data indicated students felt a higher degree of collaboration possible with their fellow students using multimedia. The questions probed

student opinion on the level of comprehension gained using the audio, video and interactive components of multimedia learning and they were supportive. The study did not gather data to discover whether the students were international students, physically challenged or part of any other classification that might explain the high overall rate of neutral responses. This study should be repeated perhaps with a larger sample group and the addition of further markers to determine stronger responses. There exists the possibility that age of the participants played a roll in this neutral response rate. An additional observation is that the use of mobile devices and social media are not widely used in classes at this time, therefore the students chose overwhelmingly to remain neutral. Linked to this segment was the question of degree of distraction caused by the use of mobile devices and social media during class and the data showed although the majority, 41.86% felt no distraction 23.26 % remained neutral. It is possible these students did not want to affect the outcome because they would actually welcome the devices and the social platforms in college classes.

Overall, I saw from the student responses that digital technology has a high impact on learning for graduate college students. The study provided results supporting its use to increase collaboration, comprehension, and engagement. Popular questions in the survey were those on audio-visual

learning and hands on technology. This area received almost 88% supportive responses of the total 97 participants. During this research I discovered how widespread the use of digital technology in college learning has become and read of the many advances in equipment, software and training yet to be released. It is the finding of this researcher that digital technology has a definitive place in college learning and will hold this position and provide a high impact in the future.

References

- Amirault, R. J. (2015). Technology transience and the challenges it poses to higher education. *Illinois State University, 16(2)*, 1-17.
- Brett, P. (2011). Students' experiences and engagement with SMS for learning in higher education. *Innovations in Education and Teaching International, 48(2)*, 137-147.
- Ciampa, K. (2013). Learning in a mobile age: An investigation of student motivation. *Journal of Computer Assisted Learning, 10*, 82-96.
- Crappell, C., Jacklin, B., & Pratt, C. (2015). Using Multimedia To Enhance Lessons And Recitals. *American Music Teacher, 64(6)*, 10-13.
- Dean, G. (2015). Digital Inclusion and Digital Literacy in the United States: A Portrait from PIAAC's Survey of Adult Skills. *Journal Of Research & Practice For Adult Literacy, Secondary & Basic Education, 4(2)*, 58-62.
- Delgado, R. (2012). Top 10 reasons technology is important for education. *Teachers with Apps*. Retrieved from www.teacherswithapps.com/top-10-reasons-technology-is-important-for-education/
- Dwyer, D. (1994). Apple classrooms of tomorrow: What we've learned. *Educational Leadership, 51(7)*, 4-10.

- Ercan, O. (2014). The effects of multimedia learning material on students' academic achievement and attitudes towards science courses. *Journal of Baltic Science Education, 13*, 608-621.
- Fessler, R. (2009). Reflections: Future of education: Challenges, questions and modest suggestions. *George Washington University, Institute for Education Studies Journal, 6*, 45-49.
- Gallup, J., Lamothe, S. N., & Gallup, A. (2015). Enhancing Transportation Education Using Mobile Devices and Applications. *Teaching Exceptional Children, 48*(1), 54-61.
- Gay, L. R., Mills, G. E., & Airasian, P. (2012). *Educational research: Competencies for analysis and application (10th Edition)*. USA.
- Gikas, J., & Grant, M. M. (2013). Mobile computing devices in higher education: Student perspectives on learning with cellphones, smartphones, & social media. *Internet and High Education, 19*, 18-26.
- Gotsick, J. E., & Gotsick, P. S. (1996). Multimedia in the classroom. *Behavior Research Methods, Instruments, & Computers, 28*(2), 291-294.
- Gourlay, L. (2014). Creating time: Students, technologies and temporal practice in higher education. *E-Learning and Digital Media, 11*(2), 141-153.

- Greenhow, C., Robelia, B., & Hughes, J.E. (2009). Learning, teaching, and scholarship in a digital age. *Educational Researcher*, 38(4), 246-259.
- Gwo, J. H., Po, H. W., Ya, Y. Z., & Yueh, M. H. (2013). Effects of the inquiry-based mobile learning model on the cognitive load and learning achievement of students. *Interactive Learning Environments*, 21(4), 338-354.
- Hargis, J., Cavanaugh, C., Kamali, T., & Soto, M. (2014). A federal higher education iPad mobile learning initiative: Triangulation of data to determine early effectiveness. *Innovative Higher Education*, 39, 45-57.
- Herrington, J., & Parker, J. (2013). Emerging technologies as cognitive tools for authentic learning. *British Journal of Educational Technology*, 44(4), 607-615.
- Hutinger, P. (1996). Computer application in programs for young children with disabilities: Recurring themes. *Focus on Autism and Other Developmental Disabilities*, 11(2), 105-114.
- Hwang, G. J., Shi, Y. R., & Chu, H. C. (2011). A concept map approach to developing collaborative mindtools for context-aware ubiquitous learning. *British Journal of Education Technology*, 42(5), 778-789.
- Jenkins, M., Browne, T., Walker, R., & Hewitt, R. (2009). The development

- of technology enhanced learning: Findings from a 2008 survey of UK higher education institutions. *Interactive Learning Environments*, 19(5), 447-465.
- Jones, D. (2009). A history of technology- mediated learning. *The Weblog of (a) David Jones*. Retrieved from <https://davidtjones.wordpress.com/2009/04/17/a-history-of-technology-mediated-learning/>
- Junco, R., Heiberger, G. & Loken, E. (2011) The effect of twitter on college student engagement and grades. *Journal of Computer Assisted Learning*, 27(2), 119-132.
- Kaye, A. (1989). Computer- mediated communication and distance education. In R. Mason & A. Kaye (Eds.), *Mindweave: Communication, computers and distance_education* (pp. 3-21). Oxford, UK: Pergamon Press.
- Kaplan, A.M., & Haenlein, M. (2010). Users of the world, unite! The challenges and opportunities of social media. *Business Horizons*, 52(1), 59-68.
- Kiernan, V. (2006). Spending on Technology Rebounds at Colleges and May Set Record This Year. *Chronicle Of Higher Education*, 52(27), A30.
- Kirkwood, A., & Price, L. (2012). Missing: Evidence of a scholarly

- approach to teaching and learning with technology in higher education. *The Open University*, 18(3), 327-337.
- McLoughlin, C., & Lee, M. (2010). Personalized and self regulated learning in the Web 2.0 era: International exemplars of innovative pedagogy using social software. *Australasian Journal of Educational Technology*, 26(1), 28-34.
- Missouri State University. (2015). Retrieved October 21, 2015, from <http://colleges.usnews.rankingsandreviews.com/best-colleges/missouri-state-2503>
- Neo, M., & Neo, T.-K. (2009). Engaging students in multimedia-mediated constructivist learning – students' perceptions. *Educational Technology & Society*, 12(2), 254-266.
- Oak, M. (2012). Why is technology so important today? *Buzzle*. Retrieved from www.buzzle.com/why-is-technology-so-important-today.html
- Shu-Ling, L. (2000). Influence of audio-visual presentations on learning abstract concepts. *Ling Tung College, Taichung, Taiwan, ROC*, 27(2), 199.
- Tay, E., & Allen, M. (2011). Designing social media into university learning: Technology of collaboration or collaboration for technology? *Educational Media International*, 48(3), 151-163.

Tzu-Chien, L., Yi-Chun, L., & Paas, F. (2013). Effects of cues and real objects on learning in a mobile device supported environment. *British Journal of Education Technology, 44*(3), 386-399.

Voorn, R.J.J., & Kommers, P.A.M. (2013). Social media and higher education: Introversion and collaborative learning from the student's perspective. *Interactive Journal Social Media and Interactive Learning Environments, 1*(1), 59-73.