EFFECTIVENESS AND SATISFACTION OF IPAD INTEGRATION IN THE UNDERGRADUATE CLASSROOM

A THESIS

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by
Teresa Edgar, ATC

Research Advisor, Dr. Thomas West

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CALIFORNIA, PA

THESIS APPROVAL

Graduate Athletic Training Education

We hereby approve the Thesis of

Teresa Edgar, ATC
Candidate for the degree of Master of Science

Date	Faculty
5/9/2013	Thomas F. West, PhD, ATC (Chairperson)
5/2/13	Michael P. Meyer, PhD, ATC
5/2/13	Vilija Bishop, MS, ATC

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INTRODUCTION

There are a wide range of a teaching technologies recently made available to the college instructor. These technologies have the potential to dramatically change the way teachers teach and students learn. Prior to full adoption, however, any new teaching methodology should be piloted and evaluated to determine its effectiveness in helping students meet their educational goals.

The use of tablet computers in the classroom is a relatively recent development. The purpose of conducting this research is to examine student's perceived effectiveness and satisfaction pertaining to the integration of iPads in the undergraduate classroom. Specifically, this project will examine lectures delivered via iPads and its associated programs. The following paragraphs will go into brief detail on previous studies performed that relate to this research.

D'Angelo and Woosley[1] surveyed a large university on the effectiveness of technology integration. The researchers investigated whether modern or techno style teachings were more effective. The results concluded modern teaching styles of PowerPoint presentations and the use of

videos were significantly greater in effectiveness of technology integration when compared to techno style teaching of blackboard and overhead projector use.[1]

Another study, conducted by Lavin,[2] surveyed whether technology impacted the quality of student learning. Students in technology driven courses were asked how they would feel if they were switched to a classroom of traditional teaching methods and vice versa for traditional courses. Results concluded technology integration has a meaningful impact on student preparation for the course, attentiveness, quality notes taken, in class participation, learning, desire to take additional courses (of the same subject or instructor), and overall evaluation of the course and instructor.[2]

The last study that closely relates to the proposed research was performed by Geist.[3] Geist examined the practicality and efficacy of iPads for senior level teachers. The teachers were responsible for using the iPads to access course materials, keep personal journals of the ten week study, and experiment with ways to integrate this device into the classroom. Results concluded that teachers found iPads to be beneficial as e-readers and the use of the web during lectures.[3]

There are multiple methods that have been utilized to evaluate the effectiveness of applying technology to courses in new ways. One study evaluated collective feedback through surveys before and after the semester, quizzes, journals, and discussions.[4] Another researcher also used a survey, and in addition evaluated the teacher's lesson plans, held progressive activities once a month, and observed the teacher's classroom.[5] Additionally, there was a study conducted using expanded PowerPoint, basic PowerPoint, and transparencies presentations throughout the semester, multiple times each. The researcher collected data through quizzes given after each unit and a survey at the end of the semester concluding which presentation they learned from best.[6] For the present study a survey will be utilized to evaluate the use of the tablet computer and iBook programs delivered via the iPad.

The first three articles discussed are closely related to the proposed research on the effectiveness of iPad integration in the undergraduate classroom. Studies have found technology, more specifically the iPad, to be beneficial in the classroom.[1-3] Since there is generally a lack of research on iPads, this research is being conducted to add further conclusions to whether moving forward with

iPads in the classroom is more effective and satisfying for student learning.

METHODS

The purpose of this study is to examine the perceived effectiveness of iPad integration in the undergraduate classroom through gathering information on how satisfied the students were with utilizing the iPads and how valuable the iPads were in the class. The following subsections will outline the research design, subjects, instruments, procedures, hypotheses, and data analysis.

Research Design

The design used in this research was a descriptive study. The independent variable was the use of iPads among students in the undergraduate classroom. Through the iPads, participants were also able to access its associated programs such as iBooks™, applications, PowerPoint™ Presentations, and Podcasts. The dependent variable was the perceived effectiveness and student satisfaction of iPads after integration into the traditional undergraduate lecture. Effectiveness is described as the participant's satisfaction towards the use of iPads and how valuable the iPads were to classroom use. The variables in this study

were measured through a survey, pertaining to the effectiveness of the iPads through student satisfaction and how valuable the iPads were after the integration of iPads.

Subjects

The subjects used in this study were undergraduate students from California University of Pennsylvania enrolled in one section of the Human Anatomy and Physiology II course lecture. This research provided subjects through the use of a stratified sample. Volunteer subjects in the health science majors signed up in class, were chosen randomly, and were then emailed by the researcher to make sure they still wanted to participate along with a copy of the informed consent form. They met the following day in the athletic training conference room to go over the study and sign the informed consent form to use the iPads and take the satisfaction survey. Out of approximately 120 students, fifteen volunteer subjects were chosen randomly to complete the study. Throughout the study, each subjects' identity remained confidential.

Each participant was asked to participate in a survey (Appendix C1) of satisfaction, value, and general questions pertaining to the effectiveness of iPad use after the two

and a half week period of iPad integration in the classroom. Each participant was asked to sign an Informed Consent Form before the study began. This study was submitted to (Appendix C2) and approved by California University of Pennsylvania's Institutional Review Board (IRB) prior to any data collection.

Preliminary Research

A pilot study was conducted prior to the research study to ensure the validity of the iBook and survey instrument. Four subjects volunteered to participate in this trial. The subjects sat through an entire lecture via the method stated above. The researcher monitored the subjects' participation with the iPad through the lecture and the survey questions. The researcher made sure the subject understood what was expected of the subject during all aspects of the study. Data was collected using a sample spreadsheet through SPSS.

Instruments

The instruments used in this research consist of an original survey created by the researcher (Appendix C1).

The faculty instructor assigned to the course delivered the lectured materials by traditional methods while the randomly selected subjects followed along on iPads via iBooks. The iBooks organized the supplemental material and consisted of lectured materials as well as associated applications, web links, and videos. After two and a half weeks of lecture, a survey consisting of questions about demographic, informative and Likert Scale questions pertaining to the effectiveness and satisfaction of iPad integration in the classroom was distributed to each participant to take on paper in the athletic training conference room.

The entire study was conducted using 15 iPad 2's. They were connected to the University's WiFi network for internet access during the course. All 15 iPads were preloaded with the Apple iBook software,[7] Anatomy and Physiology applications and content specific to the lecture topic. An iBook is a multitouch book created by use of the iBook Author[7] app from the Mac App Store and easily viewed on an iPad. The program was used for educational purposes to help deliver the course materials. The program allowed the student to shift through an electronic book with text, graphics, quizzes, videos, and application links that relate to the classroom material during the lecture and

outside of class for studying purposes. The iBook distributed to the subjects in the Anatomy and Physiology II course covered material on the skeletal and muscular tissue sections taught by the assigned course instructor. Examples of iBook pages used in the study are listed in (Appendix C3). After using the iBook via the iPad, the subject was asked to complete a survey pertaining to his/her experience with the integration of the iPad in the classroom.

The survey began with four demographic questions asking the subjects their sex, age, credit hours at this undergraduate institution, and major. The survey then asked seven informative questions about how much experience each of the subjects have with utilizing technology in daily life and in the classroom, if they own or have consistent access to an iPad, and the amount of experience with each of the following items: iPads, educational applications on Apple devices, and PowerPoint presentations. The subjects then had to rate the following course applications on how often they used the application in class and outside of class on a daily basis during the length of the study: iBook, PowerPoint lecture, applications, web links, and videos. The above questions were rated using a Likert Scale (1-1 time, 2-2 times, 3-3 times, 4-4 times, and 5-5 or more

times). The majority of the survey consisted of Likert Scale questions on how satisfied and valuable the subjects thought the integration of technology in the classroom was compared to class sessions without iPads. The Likert Scale questions were set up as followed, 1-not at all satisfied (valuable), 2-slightly satisfied (valuable), 3-somewhat satisfied (valuable), 4-very satisfied (valuable), and 5-extremely satisfied (valuable). The survey ended with another set of Likert Scale questions asking if the subjects strongly agree or disagree (1-strongly disagree, 2-disagree, 3-neutral, 4-agree, or 5-strongly) with statements on how useful technology was in the classroom. There is also an area for comments or recommendations on how to improve the utilization and usefulness of iPads in the classroom (Appendix C1).

Procedures

The instructor delivered the lecture materials to the entire class by traditional teaching methods while 15 selected subjects were also able to use the iBooks consistent with the lecture via the iPads. The subjects opened the iBooks via iPads and followed along with the faculty instructor’s lecture. As the subjects were

following along the lecture, they could click through the provided resources to gain additional knowledge through applications, web links, and videos. At the end of the study, a survey consisting of questions on the effectiveness and satisfaction of iPad integration in the classroom was distributed to each participant.

Data was collected using the Statistical Package for the Social Sciences (SPSS). The survey included nominal, ordinal, and scale measurements that were coded in the SPSS Program by numerical values that determined the frequency of responses. A paired-samples *t* test was conducted to compare satisfaction before and after the integration of iPads. Overall value was determined by the frequency (percentages) of Likert Scale responses for the iPad. Both satisfaction and value questions were set up as Likert style questions.

Hypotheses

The following hypotheses were based on prior research mentioned in the review of literature.

1. Students will report a change in satisfaction due to the use of the iPad in the classroom.

2. Students will find value in using iPads in the classroom.

Data Analysis

All data was analyzed by SPSS version 18.0 for windows at an alpha level of 0.05. Satisfaction was tested using a paired-samples *t* test. Value was determined by the frequency of responses to the Likert Scale questions. Effectiveness was tested by using the mean score for satisfaction, value, and general questions.

RESULTS

The purpose of this study was to examine the perceived effectiveness of iPads integrated into the traditional undergraduate classroom through satisfaction, value, and general questions pertaining to iPad use. This section contains the study's findings and is distributed among three subsections: Demographic Information, Hypotheses Testing, and Additional Findings.

Demographic Information

A total of 15 participants in the Anatomy and Physiology II course at California University of Pennsylvania were randomly selected out of 28 volunteers to utilize the iPads and its associated programs. The iPads were used in class three times a week for one hour a day during two and a half weeks of lectures from February 25, 2013 to March 11, 2013. Out of the 15 participants, twelve surveys were completed and used for data analysis. Three participants did not show up to complete the survey. The subjects included 10 females and 2 males. Nine were athletic training majors and 3 subjects were in the

physical therapist assistant program. The subjects' average age was 22.5y (+/-4.94). At the time of the study, the subjects had completed 29.9 (+/-20.42) credit hours at the undergraduate institution.

The subjects were asked a series of informative questions about their personal experience with technology (iPads, iPods, iPhones, PowerPoint Presentations, and associated applications) which is shown in Table 1. Out of the twelve subjects, two stated they had had consistent access to an iPad. The subjects who had consistent access to an iPad were also asked how often they utilize the iPad in daily life (1= 1-2 times a day; 2= 3-4 times a day; 3= 5-6 times a day; 4= more than 6 times a day). The results concluded a mean score of 2.50 (+/-2.121) on the above scale.

Table 1. Technology Experience in Daily Life

Questions	**Mean**	**Std. Deviation**
In general, how much experience do you have utilizing technology in daily life?	3.83	0.937
In general, how much experience do you have utilizing technology in the classroom?	3.08	1.311
How much experience do you have with iPads?*	3.33	1.155
How much experience do you have utilizing educational applications for iPads, iPhones, iPods?	2.92	1.084
How much experience do you have utilizing PowerPoint Presentations?	3.92	1.084

1=Far below average; 2=Below average; 3=Average; 4=Above average; 5=Proficient

*Only completed by subjects who had consistent access to iPads.

Hypothesis Testing

The following hypotheses were tested in this study. All hypotheses were tested with a level of significance set at $\alpha \leq 0.05$. A paired-samples *t* test was conducted for satisfaction and the frequency of responses was found for value.

Hypothesis 1: Students will report a change in satisfaction due to the use of the iPad in the classroom.

Conclusion: A paired-samples *t* test was conducted to compare the mean satisfaction score before and after the integration of iPads in the undergraduate classroom. The mean before the integration of iPads was 3.75 (*sd* = .87), and the mean after the integration of the iPad was 3.42 (*sd* = 1.08). No significant difference from before and after the iPad integration was found ($t(11) = .886$, $p>.05$).

Hypothesis 2: Students will find value in using iPads in the classroom.

Conclusion: Frequencies of the responses were shown to determine how valuable the participants found the iPads to be during the study. Almost two times the participants chose very valuable. Eleven subjects answered how they would rate the overall value of iPad integration on a Likert Scale. Results are shown in Table 2. A statistical test could not be run due to the limited number of participants.

Table 2. Frequency of Likert Scale Responses for iPad Value

Not at all Valuable	Slightly Valuable	Somewhat Valuable	Very Valuable	Extremely Valuable
1 (9.1%)	2 (18.2%)	2 (18.2%)	5 (45.5%)	1 (9.1%)

Additional Findings

A series of questions were asked using a Likert Scale to determine how satisfied the subjects were when utilizing the iPads in the undergraduate classroom. Table 3 shows the average score for each of the satisfaction questions that were asked on the survey.

Table 3. Satisfaction of iPad Integration Statistics

Questions	Mean	Std. Deviation
How satisfied were you with your course before the integration of the iPad?	3.75	0.866
How satisfied were you with your course after the integration of the iPad?	3.67	1.303
How satisfied were you with using the applications on the iPad?	3.45	0.688
How satisfied were you with the material presented on the iPad?	3.75	0.965
How satisfied were you with the iBook application on the iPad?	3.67	0.985
How satisfied were you with the use of videos in the iBook?	2.70	0.949
How satisfied were you with the use of web links in the iBook?	3.00	1.247
Overall, how satisfied were you with the integration of iPad in the course lecture?	3.42	1.084

1=Not at all satisfied; 2=Slightly satisfied; 3=Somewhat satisfied; 4=Very satisfied; 5=Extremely satisfied

A series of questions were asked using a Likert Scale to determine how valuable the iPads were for the subjects use in the classroom. Table 4 shows the average score for each of the valuable questions that were asked in the survey.

Table 4. Value of iPad Integration Statistics

Questions	Mean	Std. Deviation
How valuable was the integration of the iPad for this course?	3.00	1.279
How valuable were the application on the iPad?	3.45	0.934
How valuable was the material presented on the iPad?	3.92	0.669
How valuable was the iBook application on the iPad?	4.00	0.739
How valuable were the videos in the iBook?	2.30	0.949
How valuable were the web links in the iBook?	2.40	0.966
How valuable would a course over 15 weeks be if it utilized iPads?	3.50	1.314
Overall, how valuable was the integration of the iPad in the course lecture?	3.17	1.193

1=Not at all valuable; 2=Slightly valuable; 3=Somewhat valuable; 4=Very valuable; 5=Extremely valuable

A series of general questions were asked using a Likert Scale to determine how effective the use of iPads were in the undergraduate classroom. Table 5 shows the average score for each of the general questions that were asked in the survey.

Table 5. Effectiveness of iPad Integration Statistics

Questions	Mean	Std. Deviation
iPad integration enhanced my ability to learn.	2.83	1.267
iPad integration helped me learn the material more in depth.	2.92	1.505
iPad integration distracted me from the lectured materials.	2.92	1.564
iPad integration increased the quantity of notes I took.	2.67	1.497
iPad integration increased the quality of notes I took.	2.33	1.371
I was more attentive for this course after iPad integration.	2.33	1.073
I had more interaction with the instructor due to iPad integration.	2.33	0.985
I have a desire to take additional courses that are associated with iPad use.	2.75	1.288
iPad integration has made learning the material easier.	3.00	1.206
iPad use in the classroom will help me better prepare for exams.	2.83	1.267
iPad use outside of the classroom will help me better prepare for exams.	3.58	1.084
iPad use should continue to be used in this course.	3.33	1.155
iPad use should in integrated into other courses.	3.33	1.155
Overall, I am pleased with the integration of iPads into the classroom.	3.33	1.231

1=Strongly disagree; 2=Disagree; 3=Neutral;4=Agree; 5=Strongly agree

DISCUSSION

The purpose of this research was to examine the satisfaction and perceived effectiveness of iPad integration in the undergraduate classroom. This section is distributed among three subsections: Discussion of Results, Conclusions, and Recommendations.

Discussion of Results

Anatomy and Physiology II students at California University of Pennsylvania were asked to utilize educational applications via iPads to determine satisfaction and perceived effectiveness of iPad integration within a traditional style lecture classroom. The subjects were asked to view lecture materials via the iBook® application[7] and use associated links, videos, and applications for two and a half weeks. At the end of the two and a half weeks they were then asked to complete a survey containing questions on how satisfied they were with the iPads, how valuable the iPads were in the classroom, and general questions asking the perceived effectiveness of the iPads.

The first research hypothesis stated students will report a change in satisfaction due to the use of the iPad in the classroom. After a paired-samples *t* test was conducted, it was determined that there was no significant difference in satisfaction before and after iPad integration. The mean before the integration of iPads was 3.75 (*sd* = .87), and the mean after the integration of the iPad was 3.42 (*sd* = 1.08). Therefore, students were slightly more satisfied with a traditional classroom setting compared to a technology driven classroom, although not significantly so. However, when looking at each individual question related to satisfaction (Table 3), the students indicated levels of satisfaction with some aspects of the integration including the statement, "How satisfied were you with the material presented on the iPad?."

The second hypothesis states students will find value in using iPads in the classroom. After gathering data from Likert Scale questions, frequencies showed 9.1% of students found the iPad to not be valuable at all. However, 45.5% of students found the iPad to be very valuable in the classroom. A statistical test could not be run due to the limited number of participants that completed the survey.

Of the 11 participants, 5 chose very valuable and 1 chose extremely valuable. Therefore 6 participants found

the iPads to be at the least very valuable compared to the other 4 that found the iPads to be slightly or somewhat valuable and 1 participant who found no value in the iPad. When looking at individual value questions (Table 4), the questions "How valuable was the iBook application on the iPad?" concluded to be very valuable with a mean score of 4.000 (*sd*=0.739).

A series of general questions were asked on a Likert Scale (1=Strongly disagree; 2=Disagree; 3=Neutral;4=Agree; 5=Strongly agree) to gauge the perceived effectiveness of iPad integration. The questions that pertained to enhanced learning (M=2.830, *sd*=1.267), quantity of notes taken (M=2.670, sd=1.497), quality of notes taken (M=2.330, sd=1.371), attentiveness for the course (2.330, *sd*=1.073), interaction with the instructor (M=2.330, *sd*=0.985), desire to take additional iPad integrated courses (M=2.750, *sd*=1.288), and better prepared for exams with iPads in the classroom (M=2.830, *sd*=1.267) resulted in an average score that shows the average of students disagree or are neutral with the Likert Scale questions. In Lavin's[6] study, the researchers also found the quantity of notes they take and the interaction with the instructor along with the amount of time that students study and their attendance to be technology neutral.[2]

In contrast, Lavin[2] found technology to have a meaningful impact on attentiveness, quality of notes taken, and student participation in class.[2] The average of students disagreed or were neutral about iPads distracting them during the lecture (M=2.920, *sd*=1.564) in the present study. Students were neutral when asked if iPad integration made learning the material easier (M=3.000, *sd*=1.206). The questions that pertained to the use of iPads outside of class to better prepare for exams (M=3.580, *sd*=1.084), iPad should continue to be used in this course (M=3.330, *sd*=1.155), iPad should be integrated into other courses (3.330, *sd*=1.155), and overall pleased with iPad integration in the classroom (M=3.330, *sd*=1.231) resulted in an average score of students agree or are neutral with the Likert Scale questions. Also in Lavin's[2] study, the researchers found a meaningful impact on student preparation for class, desire to take additional classes from the instructor or in the subject matter, and the overall evaluation of the course and instructor.[2]

In general there was no significant difference found for the first hypothesis. However, this may be due to the small sample size and the lack of participation in completed surveys. If the present study had a larger sample size, the results may had concluded a significant

difference such as D'Angelo and Woosley's[1] study established. Their research found modern teaching styles of PowerPoint and video were shown to be significantly greater in the effectiveness of teaching at a mean of 3.84 (.731) compared to traditional teaching styles (blackboard and overhead transparencies) which resulted in a mean of 3.21 (.777).[1] There was a small, non-significant decrease in how satisfied students were after iPad integration. On the other hand, students found iPad integration to be valuable for the course. This could be due to the lack of knowledge pertaining to navigating the iPad, short period of time the subjects utilized the iPad, or the age difference of the participants.

Conclusions

There is very little research specific to iPad integration in the literature, and no research published on the iBook Author application utilized in this study. Therefore the majority of studies utilized related to technology in general. Due to the limited research, the present study was exploratory in nature in an effort to guide future research. The present study found there to be

no significant effect of iPad integration on satisfaction or value.

However, the study did find trends in the data that majority of students found the iPads to be valuable and somewhat effective in the classroom when individual question responses are examined. It is possible that future studies will be conducted to find data that may or may not support iPad integration in the classroom. More and more classrooms are technology driven today. Technology is the new way of learning and there is supportive data that technology among the classroom is effective in education.[1,2]

If this same course was taught next semester, iPads should be utilized for the entire semester. Each student would be assigned and have access to the class materials on the iPads in and outside of the classroom. iBook Author would be used to deliver the bulk of lecture materials along with a few educational applications, videos, links, and podcasts. The main two applications that would be used are Netter's Atlas of Human Anatomy and Muscle and Bone Anatomy 3D. These applications allow the student to view diagrams of the sections or systems of the human body while they are being covered in class. Educational videos can be found on YouTube.com that condenses the same lectures materials into a short video with corresponding diagrams.

Web links to pages with more in depth information about the topic can be used for those who still don't understand or want to know more about the materials after the lecture. Lastly, podcasts can be used as another study aide for students. If students miss a class, the teacher is speaking to fast for note takers, or they want to review the lecture again podcasts would be uploaded after each lecture that allows the students to hear what was said in class with the lecture.

Recommendations

Further research on iPad integration in the undergraduate classroom would be more beneficial with a few changes in the study itself and the survey. First, it would be more beneficial for students to use the iPads during the entire length of the course and ask everyone in the class to utilize the iPads. However, California University of Pennsylvania did not have more than 20 iPads to use for this study. If this were to happen, the course instructor could use different means of delivering lectured materials such as podcasts, videos, links for webpages, educational applications, etc. during class. These materials were available to the students, however, many did not utilize

them during the two and a half weeks they had access to the iPads.

Future research would benefit from a larger sample size. A whole lecture classroom or multiple classrooms would help to determine if there is any significant effect on learning within the study. The present study was limited to the number of participants due to the number of iPads available and number of participants who completed the survey.

Additionally, future surveys can focus on ensuring that participants utilize all of the technological materials provided to them. In the present study, the subjects rated how often they used the iBook, PowerPoint presentations, educational applications, educational web links, and educational videos in and outside of class. They were to circle one of the following: 1 time, 2 times, 3 times, 4 times, and 5 or more times. It was assumed each participant would utilize all of the materials in and outside of class since the iPads were available during class and certain times outside of class. Many of the participants did not answer these questions or wrote in none. Other questions could also be modified to obtain better information about the use and value of the various applications.

Lastly, in addition to a larger sample size, the survey could be conducted online. In such a technology driven period, the majority of participants might prefer taking the survey online.

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APPENDICES

APPENDIX A

Review of Literature

REVIEW OF LITERATURE

Technology in the Classroom

Technology is beginning to be the new era of teaching in the classroom. Many teachers are encouraged to make lessons that are able to utilize technological devices or programs in the classroom.[1] Most students have access to some sort of technological device at home or school and many students prefer using technology during lectures. Teachers can set up real world applications on devices that encourage more students to participate in classroom activities. Students are more inclined to use technology today because of its popularity and the usefulness of the programs associated with the devices. Phones and iPods are used a planners, applications on smartphones and iPads make it easy for students to research topics through the dictionary or internet or by taking a simple picture of the lecture on the board. Technological devices can be used in many different ways in the classroom. There are multiple ways we can enhance learning in the classroom and this has been shown through more teachers integrating technological

devices and applications that coincide with their lectures into lectures.[1]

The purpose of this Review of Literature is to examine the effectiveness of technology integration within the classroom. This will be presented through previous studies of students' perceptions, behaviors, and characteristics pertaining to the integration of technology; specifically, the use of iPads, PowerPoint presentations and Podcasts in the classroom. The following sections will discuss more in depth studies relating to this research. The Review of Literature will end in a brief summary relating each of the technological advances within lectures today.

Integration of Technological Devices in the Classroom

In D'Angelo and Woosley's[2] study, the researchers investigated three questions regarding classroom technology. The questions are as followed:

> "What kinds of technology are students experiencing in the classroom?[2]"; "Do students perceive certain education technology environments as being more conducive to their learning?[2]"; "Are there differences in how various subpopulations of students view the

effectiveness of various learning technology environments?[2]".

The survey was distributed among a large university to four criminal justice classes. Of the 251 respondents to the survey, 64% were criminal justice majors, while 12% were minoring in criminal justice.[2] The survey included demographic questions; whether the students were exposed to technologies in the classroom such as the use of a chalkboard, PowerPoint Presentation, group work on the blackboard, overhead transparencies, blackboard, on-line courses, or video; the use of the Likert scale to survey the perceptions of the students on each of the above technologies. The perceptions investigated were whether the students' knowledge of the lecture increased or decreased with the integration of technology in the classroom. The survey showed 95.2% were taught via a chalkboard; 97.6% via PowerPoint Presentation; 42.6% via group work on the blackboard; 96.4% via overhead transparencies; 83.7% via the blackboard; 19.9% via on-line courses; and 79.1% via video. Effectiveness was measured on a scale of 1-5 with 1 being strongly disagree, 3 being undecided, and 5 being strongly agree. Modern teaching styles of PowerPoint and video were shown to be significantly greater in the effectiveness of teaching at a mean (M) of 3.84 (.731)

compared to traditional teaching styles (blackboard and overhead transparencies) which resulted in a M of 3.21 (.777). The study also shows modern teaching styles were utilized significantly less than "techno teaching styles[2]" which are considered to be the use of a blackboard and on-line classes. The students thought they were gaining more knowledge if the lecture was delivered via a PowerPoint Presentation than techno style materials. The results also showed the effectiveness of traditional styles were significantly greater than the delivery of materials through techno styles. The researchers feel students are more comfortable with PowerPoint Presentations because of both the visual graphics or videos and the written information on the slides. Overall, students thought they learned more from PowerPoint presentations and they were shown to be slightly more effective than traditional classroom styles.[2]

Bielefeldt[3] did a two year correlational study that provided information on classroom characteristics towards technology use in the classroom. The characteristics include how the teacher provides the lectures and the roles of the instructors. Results were gathered through 144 classroom observations by three trained observers. Observations were conducted through the ISTE Classroom

Observation Tool on classrooms in the United States that were given technology grants for student and teacher use. The observer would watch the class for engagement throughout the lecture. If a student was not paying attention for more than three minutes, the student would be counted as not engaged with the lesson. Majority of classrooms only had one or two students who were not engaged with the lecture out of an average size class of twenty-four. The three observers concluded that more students are inclined to use technology individually compared to the use of technology by teachers. With a classroom of whole student participation, teachers were more inclined to use technology. Overall, students were more engaged with technology derived classrooms.[3]

Groves[4] article provides information on five teachers from New South Wales, Australia and how they came to understand the changing of technology in the classroom. Teaching experience ranged from three to twenty-four years for these five teachers. They were to complete an introductory situational analysis, a professional learning session, three or more two hour sessions in class and a debriefing afterwards. Data were collected through the learning sessions listed above and observation of teaching, interviews, and a group interview of the students. The data

showed writing and pedagogy changes within the classroom texts since the integration of technology in the traditional classroom. As for pedagogy changes, the data showed two main ways to improve teacher use of technology: teachers should work "at their own pace[4]" and talk with colleagues about how they are integrating technology into their classrooms. Writing among these teachers changed by incorporating multimodal texts such as visual learning, video and editing, designing activities or websites, and using digital photos for learning purposes. In this study, the main reason for changing teaching practices among these teachers were conversations among colleagues.[4] Another article by Mitchell provides information on why teachers should implement technology use in the classroom. Many colleges use technology to increase the marketing of students and the university; increase productivity of students; increase cost effectiveness; and prepare students for employment since some may have been limited to traditional teaching materials.[5]

Technological Devices Impact on Students Behaviors, Perceptions, and Characteristics

Technology had been added to the classroom as a way to help improve student learning. Some researchers find the change beneficial for the students learning environment and the student's academic scores.[6-10] The next few articles discuss researcher's findings of students behaviors, perceptions, and characteristics towards technology integration in modern classrooms.

In Lavin's[6] study, the researchers provide information on whether technology in the business classroom has impacted the quality of learning for students through surveying students behaviors and perceptions in a Midwestern university. Students who were in a technology driven classroom were surveyed about how they would feel if they were switched to a traditional style of teaching and vice versa for students who were in a traditional style teaching setting. The survey consisted of demographic questions; questions regarding technology using a five point scale from one being "was significantly positive[6]", 3 being "no difference[6]", and 5 being "was significantly negative[6]". The results of approximately 550 surveys concluded that taking technology out of the classroom would

cause a positive effect on how much students study for class or exams, successfulness of note taking, attendance, and how the students view their instructor's lecture effort. However, this study also showed if technology was taken out of the classroom it would have a negative impact on student learning specifically attentiveness, amount of knowledge learned, and to take another class by same instructor or in the same subject. A student would also favor the course and instructor if technology was added to a course. For a traditional style class, students said it would be more beneficial to integrate technology for all reasons except technology would have a negative impact for interaction with teachers and taking more of the subject courses. The time a student would study for class or exams, note taking, attendance, and interaction with teacher in and outside of class were neutral for both groups. Overall, students had positive behaviors and perceptions if technology is added to a traditional classroom. If technology was taken away from technology driven classrooms, students behaviors would not be affected. Technology has a positive impact on students when they learn, prepare for class, take better notes, attend more classes, etc.[6]

In Perry's[7] study, they provide information gathered through survey from 139 students in sciences classes. The researchers wanted to assess the technological experience level of each student and their opinions on how they feel about technology being integrated into the classroom. The survey consisted of demographic questions, computer usage questions, and answers to questions after watching an online program. Results showed 86% of students like technology in the classroom and showed positive results with watching and answering questions about the online program.[7] Another study by Baser[8] shows a list the perceptions of students towards the integration of technology in the classroom. The researchers gathered quantitative and qualitative data for this study from junior high students. The survey consisted of demographic questions, computer experience, opinions of computer usage, and open-ended questions. Out of 189 participants, 63.5% stated they have a computer at home; 50.8% of the participants feel they are proficient at using a computer, 43.9% feel they are at an intermediate level and 5.3% are novice; 85.2% use a computer for homework while 73.5% use the computer for games; 84.1% stated they use the internet for homework while 77.2% use the internet for fun. The qualitative data showed 121 of the 189 students stated

using technology increases their academics and 156 participants believe teachers who use technology have a positive effect towards students academics as well.[8]

The next two research articles show characteristics and perceptions of technology added into the classroom. Eastman's[9] article provides characteristics of business student's perceptions towards interactive technology. The characteristics measured are if students are more engaged with technology in the classroom; how well students prepared before class; students attitude towards technology; and if students are satisfied with technology in the classroom. Results showed a positive relationship between paying attention and a positive attitude; a positive relationship between a positive attitude and satisfaction; and no relationship between being prepared because of technology and the students attitude.[9] Vandewaetere's[10] study focuses on the perceptions of students when adapting to technology in the classroom. The researchers tried to show results of a mediational paradigm but failed to do so. This study does show a relationship between adaptively, perceptions, and motivations among technology integrated into the classroom.[10]

iPads/Tablets in the Classroom

IPads and digital tables are the new way of the era. The next few articles show the use of iPads and tablets in the classroom for lectures. A few researchers provide information on the enhancement of student performance after the integration of technology in the classroom in the following paragraphs.[11-17]

In Geist's[11] study, researchers examined the practicality and efficacy of iPads for ten weeks in a preparation class for senior level teachers. Preloaded software was put onto the iPads. Teachers were to use the iPads to access course materials (readings, videos, and class system). Teachers were encouraged to use the iPads for other classes, keep personal journals of the ten weeks, and experiment with ways to integrate this device into the classroom of their own. Results were taken by observations, the ten week journals, and surveys. This study concluded that teachers found iPads to be beneficial in the classroom as e-readers and informative via the web during lectures.[11]

Saine's[12] study revealed information on iPods, iPads, and SMARTBoards being integrated into the traditional classroom. These technologies are improving the way students engage in classroom work. Students are excited to

use these technologies in the classroom. Some teachers find these technologies to help improve the creativity of students thinking while others find technology to be a great way to provide information to students in a fun and exciting new way.[12]

Weisberg's[13] study provides collective feedback on students, faculty, and administrative behaviors, attitudes, and perceptions on digital textbooks (devices). This two year study was conducted at Sawyer Business School at Suffolk University. The students were broken into six groups. Five groups were given technological devices while one group was given regular textbooks. Results were provided though quizzes, discussions, and journals throughout the semester. Surveys were also given before and after each semester. Students are accepting technology as it is integrated into the classroom, however, there was no significant difference in the devices and textbooks.[13]

In Crichton's[14] study, researchers show the opportunities and challenges for students and teachers when integrating handheld devices into the classroom. Results were collected through surveys, developmental activities every month with teachers, copies of the teacher's lesson plans, and class observations. With iPod Touch devices added to the classroom, students would use them to listen

to podcasts, but insisted on using a laptop for the internet, agendas, writing papers, etc. Prior to this study, 60% had never used this device and 70% understood how to use it within an hour. Most students preferred to use technology in the classroom and now the study will integrate the use of iPads into the classroom to see how well students adapt to them.[14]

Murray's[15] article provides information on if iPad devices will positively affect teaching and learning of K through level 12 students. Even though the iPad only came available for a few weeks previously, it had already sold 3 million units. The reasoning many believe for the iPad being so popular so quickly can be linked to the same applications as the iPhone and iPod Touch. This article mainly focuses on the applications of the iPad that can be used in a classroom setting and if these applications are able to allow certain styles of teaching that other traditional techniques could not.[15] Another article that describes how technology should be used for teaching is Hill's[16] article. It provides background information on how iPads, Personal Digital Assistants, and Smart Phones can be integrated into the classroom to improve educational lectures. Since technology in the classroom is the new style of teaching, teachers should be educated on how to

include technological devices such as the ones listed above into lectures, assignments, and creative projects.[16]

Enriquez's[17] study provides information on how teachers can enhance classroom learning by integrating tablet PC's and other wireless technological devices into lectures. It shows how teachers can provide a more interactive classroom, improve learning, and provide feedback with the use of technology. Results from surveys show positive student perceptions of technology integration. This had led researchers to believe technology would be better used in problem-solving courses compared to traditional classrooms.[17]

PowerPoint Presentations in the Classroom

The following articles demonstrate results that correspond with the purpose of this study: information on the effectiveness of PowerPoint presentations in the classroom. In Lai's[18] study, students found PowerPoint presentations with annotations were helpful in the classroom. 170 students were subject to both PowerPoint presentations with annotations and a lecture with a whiteboard. Majority of students learned the information better since the lecture included both verbal and graphical

visuals. A survey showed PowerPoint presentations allowed the students to better interpret the lecture rather than a lecture that consisted of a whiteboard full of notes.[18]

In Bartsch's[19] study, the researchers gathered information on whether students would choose PowerPoint presentations over traditional overhead transparencies and if they received better grades after sitting through lectures from these presentations. The thirty-nine students in a Social Psychology class sat through different presentations (transparencies, basic PowerPoint, and expanded PowerPoint) throughout the semester. Each type of presentation was used many times to decrease bias. Since PowerPoint presentations were new at the time of this study, to decrease bias from students choosing PowerPoint presentations over overhead transparencies because they were different, the researchers gave PowerPoint lectures to students all semester. Results were gathered from each students quiz at the end of each unit; an anonymous survey from 1-9 (1 – learned nothing, 5 –learned some information, 9- learned a large amount of information); and a survey rating 1-9 (1- Strongly Disagree, 5- Neutral, 9- Strongly Agree) on how the students liked each presentation. This study showed students preferred and felt like they learned more from PowerPoint lectures compared to transparencies.

However, students did 10% worse on the quizzes after given an expanded PowerPoint presentation compared to transparencies and basic PowerPoint presentations.[19]

In Burke's[20] study, the researchers surveyed the effectiveness of PowerPoint presentations versus the traditional classroom lectures. Out of 262 participants, 230 surveys were used in this study. The survey consisted of Likert-type questions pertaining to the effectiveness of the presentation such as whether the student understood the lecture; interactions in the classroom (burnout, talking to others, attention spans, motivation, behaviors, attitudes, talking notes, etc.); and the material presented in the presentations. Results showed that more students feel PowerPoint presentations provide a better cognitive learning and positive perceptions of influence compared to during traditional lectures.[20]

The use of a blackboard in the classroom is a great way to deliver information and keep up with the instructor. However, writing on the blackboard takes up a lot of time and limits ways to present the information.[21] Instructors found a better way to decrease time spent on creating presentations and delivering more information and visuals to the class through PowerPoint presentations. This frees up the teachers time from writing on the board to

interacting with the students. It also is easily stored, reusable, and provides pictures, graphs, texts, sounds, etc. that corresponds with the lecture. The effectiveness of PowerPoint lectures in the classroom seems to be favored by students. However, even though students feel they learn better or like PowerPoint presentations better, in Bartsch's study, majority of students scored less on the PowerPoint lecture quizzes.[19] PowerPoint lectures are known to be a great tool to deliver verbal and visual displays in the classroom[19], but more studies should be conducted to better understand why students prefer PowerPoint lectures but seem to lack interpreting this information.

Podcasts in the Classroom

Podcasting was founded in 2003 after the creation of the iPod by Apple Inc.[22] It was first used in Willowdale Elementary School in Nebraska by students for art history. It is now used in the classroom as a way to relay messages by recording their voice and/or typing a text message. Podcasting shows discipline-based reading, writing, and research. It allows the student to edit, orally read to student or record a presentation, learn new technology, and increase problem solving and creative thinking.[22]

Hew's[23] article provides information on the most common uses of the Podcast in K-12 and higher levels in school. The article breaks it down into three categories the researchers gathered information about: how participants were using podcasts; effects of using podcasts for learning; and how podcasts influenced participants learning. The most common uses of the podcast were students listening to lectures from professors or to review material on their own time. Another plus with the podcast is students can replay specific parts of the lecture that they missed at any time.[23]

In Beard's[24] study, fifty nursing students were selected for this study on whether podcasts or regular textbook reading met learning objectives. The students were to read a chapter and listen to the podcast within one week before attending class. Once students attended class, they were asked to complete a seven question pretest on the material. After completing the pretest survey, the instructor read aloud a similar material on the same topic and a thirty minute discussion. The students were then given a posttest to complete which was the same pretest. Results were shown by a paired-samples t test to compare the two styles of teaching. Even though students scored better after reading aloud and taking part in the

discussion, 80% of students preferred the podcast lecture over the textbook. However, only nine students actually listened to the podcast within the week.[24]

Bartlett's[25] article provides background information and how podcasts can be used in the classroom. There are applications that can be downloaded for each subject in school. When it comes to reading, the podcasts allow students to portray a story through the authors' voice and tone. Examples of how to integrate podcasts into the classroom other than lectures could be for teachers to assign students to create their own podcasts for projects. Podcasts are a way to deliver information and a way for students to show their artistic side.[25]

Summary

In closing, the previous research has provided information on how technological devices can be used in the classroom through many different techniques. Learning in the classroom can be enhanced using more teachers providing lectures through these technological devices and programs.[1-25] Technology integration among traditional style classrooms has shown to be beneficial among students and instructors.[1-25] Of course, technology also had its downfalls, but

overall the perceptions, behaviors, and characteristics of students were positive towards technological devices having been integrated into the classroom.[6-10] Overall, the researcher's showed studies that can be examined to determine if technology integration was effective in teaching methods.

APPENDIX B

The Problem

STATEMENT OF THE PROBLEM

The purpose of the study is to examine the effectiveness of iPad use after being integrated into a traditional classroom. It is important to examine this relationship because technology among the classroom is popular in this era. More instructors are integrating technology to create more interesting lectures by using visual graphics, sounds, etc. Additionally it would be beneficial for instructors to know if integrating technology in the classroom is effective in students' knowledge of the lecture and satisfaction of using iPads and its associated programs.

Definition of Terms

The following definitions of terms will be defined for this study:

1) iPad – released by Apple Computer, Inc. in 2010.[26] It provides the following features: multi-touch interface, multimedia processing, virtual keyboard, iBook application, and other applications used by the iPhone.[26]
2) PowerPoint – an application, released by Microsoft, used to create presentation slides.[27]

3) Podcast – a digital audio recording that can be played or downloaded over the computer.[28]

4) Application – computer programs used on the iPads. Software programs used as tools[29] to complete a project, gain knowledge, etc.

Basic Assumptions

The following are basic assumptions of this study:

1) The subjects will be honest when they complete their demographic sheets.

2) The subjects will be honest when they complete their satisfaction survey.

3) The subjects will follow along on the iPad without being distracted with applications that do not relate to the study.

4) The subjects will have experience using PowerPoint presentations.

Limitations of the Study

The following are possible limitations of the study:

1) The validity of the technology satisfaction survey has not been established.

2) Subjects may be distracted during lecture with other applications that do not coincide with this study.

3) Amount of subjects that will volunteer and fully complete the survey.

Significance of the Study

This study will show results of student's satisfaction and perceived effectiveness of iPad integration. It will also show if students are satisfied with iPad use among the classroom. This study is important to the field of teaching to determine if students are satisfied with iPad integration and to determine how students perceive the effectiveness of iPad use.

APPENDIX C

Additional Methods

Appendix C1

iPad Integration Survey

SURVEY

Demographic Questions:

1. Are you male or female?

_____ Male

_____ Female

2. What is your age?

_____

3. Approximately, how many credit hours have you completed at this undergraduate institution?

_____

4. What is your major?

_____ Athletic Training Education Program

_____ Physical Therapy Assistant

_____ Other

Informative Questions:

1. In general, how much experience do you have utilizing technology in daily life?
   a. Far below average
   b. Below average
   c. Average
   d. Above average
   e. Proficient
2. In general, how much experience do you have utilizing technology in the classroom?
   a. Far below average
   b. Below average
   c. Average
   d. Above average
   e. Proficient

3. Do you own or have consistent access to an iPad? If yes, answer #4 and 5. If no, skip to #6.

   _____

4. How much experience do you have with iPads?
   a. Far below average
   b. Below average
   c. Average
   d. Above average
   e. Proficient
5. How often do you utilize the iPad in daily life?
   a. 1-2 times a day
   b. 3-4 times a day
   c. 5-6 times a day
   d. More than 6 times a day
6. How much experience do you have utilizing educational applications for iPads, iPhones, iPods?
   a. Far below average
   b. Below average
   c. Average
   d. Above average
   e. Proficient
7. How much experience do you have utilizing PowerPoint Presentations?
   a. Far below average
   b. Below average
   c. Average
   d. Above average
   e. Proficient

Technology Integration

Please rate the following course applications as you used them in collaboration with the iPad.

iBook

How often have you used the iBook in class during the length of the study

1	2	3	4	5
1 time	2 times	3 times	4 times	5 or more times

How often have you used the iBook outside of class during the length of the study

1	2	3	4	5
1 time	2 times	3 times	4 times	5 or more times

PowerPoint Lecture

How often have you used the PowerPoint lecture in class during the length of the study

1	2	3	4	5
1 time	2 times	3 times	4 times	5 or more times

How often have you used the PowerPoint lecture outside of class during the length of the study

1	2	3	4	5
1 time	2 times	3 times	4 times	5 or more times

Educational Applications

How often have you used applications in class during the length of the study

1	2	3	4	5
1 time	2 times	3 times	4 times	5 or more times

How often have you used applications outside of class during the length of the study

1	2	3	4	5
1 time	2 times	3 times	4 times	5 or more times

Educational Web Links

How often have you used web links in class during the length of the study

1	2	3	4	5
1 time	2 times	3 times	4 times	5 or more times

How often have you used web links outside of class during the length of the study

1	2	3	4	5
1 time	2 times	3 times	4 times	5 or more times

Educational Videos

How often have you used videos in class during the length of the study

1	2	3	4	5
1 time	2 times	3 times	4 times	5 or more times

How often have you used videos outside of class during the length of the study

1	2	3	4	5
1 time	2 times	3 times	4 times	5 or more times

Satisfaction: Please rate the following questions on how satisfied you were with iPad use in the classroom when compared with the class sessions without iPads. Please rate the questions by using the scale provided below.

1 - Not at all satisfied

2 - Slightly satisfied

3 - Somewhat satisfied

4 - Very satisfied

5 - Extremely satisfied

1. How satisfied were you with your course before the integration of the iPad?
2. How satisfied were you with your course after the integration of the iPad?
3. How satisfied were you with using the applications on the iPad?
4. How satisfied were you with the material presented on the iPad?
5. How satisfied were you with the iBook application on the iPad?
6. How satisfied were you with the use of videos in the iBook?
7. How satisfied were you with the use of web links in the iBook?
8. Overall, how satisfied were you with the integration of the iPad in the course lecture?

Valuable: Please rate the following questions on how valuable they were to your learning during iPad use in the classroom when compared with the class sessions without iPads. Please rate the questions by using the scale provided below.

1 - Not at all valuable

2 - Slightly valuable

3 - Somewhat valuable

4 - Very valuable

5 - Extremely valuable

1. How valuable was the integration of the iPad for this course?
2. How valuable were the applications on the iPad?
3. How valuable was the material presented on the iPad?
4. How valuable was the iBook application on the iPad?

---

5. How valuable were the videos in the iBook?
6. How valuable were the web links in the iBook?
7. How valuable would a course over 15 weeks be if it utilized iPads?
8. Overall, how valuable was the integration of the iPad in the course lecture?

Please rate the following on the below scale.

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

1. IPad integration enhanced my ability to learn.
2. IPad integration helped me learn the material more in depth.
3. IPad integration distracted me from the lectured materials.
4. IPad integration increased the quantity of notes I took.
5. IPad integration increased the quality of notes I took.
6. I was more attentive for this course after iPad integration.
7. I had more interaction with the instructor due to iPad integration.
8. I have a desire to take additional courses that are associated with iPad use.
9. IPad integration has made learning the material easier.
10. IPad use in the classroom will help me better prepare for exams.
11. Ipad use outside of the classroom will help me better prepare for exams.
12. IPad use should continue to be used in this course.
13. IPad use should be integrated into other courses.
14. Overall, I am pleased with the integrations of iPads into the classroom.

Comments

What recommendations do you have to improve the utilization and usefulness of iPads in the classroom?

APPENDIX C2

IRB: California University of Pennsylvania

Institutional Review Board
California University of Pennsylvania
250 University Avenue
California, PA 15419
instreviewboard@calu.edu
Robert Skwarecki, Ph.D., CCC-SLP,Chair

Dear Ms. Edgar:

Please consider this email as official notification that your proposal titled "Effectiveness and Satisfaction of iPad Integration in the Undergraduate Classroom" (Proposal #12-034) has been approved by the California University of Pennsylvania Institutional Review Board, with the following stipulations:

-- In section 12 of the consent form, text equivalent to "and all data will be discarded" must be included in the description of discontinuation of participation in the study.

Once you have amended the consent form, you may immediately begin data collection. You do not need to wait for further IRB approval. At your earliest convenience, you must forward a copy of the consent form for the Board's records.

The effective date of the approval is 2/14/13 and the expiration date is 2/15/14. These dates must appear on the consent form.
Please note that Federal Policy requires that you notify the IRB promptly regarding any of the following:

(1) Any additions or changes in procedures you might wish for your study (additions or changes must be approved by the IRB before they are implemented)
(2) Any events that affect the safety or well-being of subjects
(3) Any modifications of your study or other responses that are necessitated by any events reported in (2).
(4) To continue your research beyond the approval expiration date of 2/15/14 you must file additional information to be considered for continuing review. Please contact instreviewboard@cup.edu

Please notify the Board when data collection is complete.

Regards,
Robert Skwarecki, Ph.D., CCC-SLP
Chair, Institutional Review Board

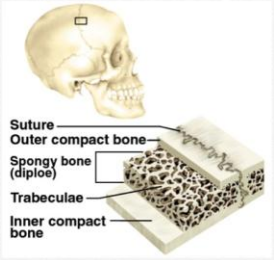
APPENDIX C3

Picture Examples of iBook Author

iPad 1:40 PM 63%

Structure of Flat Bone

Flat Bone



- External and internal surfaces of flat bone are composed of compact bone
- Middle layer is spongy bone
  - No marrow cavity

To view an application of flat bone structure please click here

4

iPad 1:40 PM 63%

Shapes of Bones

REVIEW 1.1 Bone Shapes

The talus is considered to be which shape of bone?

- **A.** Short
- **B.** Long
- **C.** Irregular
- **D.** Flat

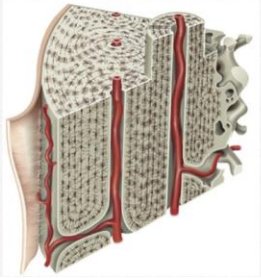
Check Answer

3

iPad 1:26 PM 58%

Bone As A Tissue

Bone Tissue



Bone Tissue

- Dynamic tissue that continually remodels itself
- Bones and bone tissue
  - bone or osseous tissue is a connective tissue with a matrix hardened by minerals (calcium phosphate)
  - bones make up the skeletal system
    - individual bones are made up of bone tissue, marrow, cartilage & periosteum
- Functions of the skeletal system
- support, protection, movement, blood formation, mineral reservoir, pH balance & detoxification

2

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Abstract

TITLE: EFFECTIVENESS AND SATISFACTION OF IPAD INTEGRATION IN THE UNDERGRADUATE CLASSROOM

RESEARCHER: Teresa Edgar, ATC

ADVISOR: Thomas F. West, PhD, ATC

CONTEXT: Technology is utilized in the majority of the classrooms today; however, there is limited research on whether technology is effective in delivering the lectured materials.

OBJECTIVE: This study examined the perceived effectiveness of iPad integration in the traditional classroom through a survey pertaining to satisfaction, value, and general effectiveness of utilizing the iPads.

DESIGN: Descriptive survey.

SETTING: Anatomy and Physiology II course at California University of Pennsylvania. Patients or Other Participants: 15 out of approximately 120 undergraduate health science students from a stratified sample (Gender=2 males, 10 females; Major=9 athletic training education program, 3 physical therapist assistant program; age=22.5±4.94; completed credit hours=29.9±20.42).

INTERVENTIONS: Once majors were determined for each subject in the course, participants were randomly chosen from health science majors at this university. Participants received an email with the informed consent form and information pertaining to this research. Subjects utilized iPads during each lecture for 2.5 weeks. A hard copy survey pertaining to the satisfaction value, and effectiveness of iPad integration in the traditional style

classroom was distributed to each participant. The participants had one week after the length of the study to complete the entire survey. A paired-samples *t* test was conducted to compare the mean satisfaction score before and after iPad integration in the undergraduate classroom. Value was determined by gathering frequencies of how valuable the subjects found iPad use in the classroom.

MAIN OUTCOME MEASURES:
Respondents will answer Likert style questions pertaining to satisfaction, value, and general effectiveness of iPad integration.

RESULTS: 12 out of 15 completed surveys concluded no significant difference was found for both hypotheses. Hypothesis 1 found ($t(11) = .886$, $p>.05$). Hypothesis 2 found 9.1% of students did not find the iPad to be valuable at all. However, 45.5% found the iPad to be very valuable in the classroom. A statistical test was not run due to the limited number of participants. Additional results were found for satisfaction, value, and general questions pertaining to effectiveness of iPad integration.

CONCLUSION: This study found there to be no significant effect of iPad integration on satisfaction or value. However, the study did find trends in the data that majority of students found the iPads to be valuable and somewhat effective in the classroom when individual question responses are examined.

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