Technology's Effect on Student Engagement at the High School Level

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A Special Project

Presented to

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In Partial Fulfillment

of the Requirement for the Degree of

Master of Education

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Spring 2014

FACULTY APPROVAL

Technology's Effect on Student Engagement at the High School Level

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ABSTRACT

The purpose of this project is to investigate how technology can have an effect on increasing student engagement in a Career and Technical Education (CTE) classroom. After researching best practices around integrating technology in the classroom to improve student engagement, the teacher-researcher surveyed students enrolled in CTE classes at a low-socioeconomic high school in Lower Eastern Washington. Using the student surveys, the teacher-researcher analyzed the student's opinions about using technology and how it affected their learning.

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CHAPTER 1

Introduction

Background for the Project

In the world of education, there are many problems when it comes to helping students succeed. What style of teaching is most effective? How should students be scored? How can you engage the unengaged generation?

Technology that includes computers, cell phones, and tablets are everywhere in American society. For people in the 21st century, cell phones are being used to stay in contact with people from the other side of the world, computers are getting smaller and more powerful, and doctors are using tablets for efficiency of keeping information on patients.

This technology is also affecting how teachers are instructing their students. Long gone are the days of overhead projectors and dry erase markers. PowerPoint is becoming the norm to lecture. Basic research starts by a quick search of the Internet and entire degrees can be earned online. The question to be asked: is all this incorporation of technology really helping students be engaged in their learning?

Statement of the Problem

Technology has become a major priority of the education system. Schools are targeted towards having a “paperless” classroom where textbooks will be

available on tablets, assignments will be turned in online, and teachers can record themselves and load up videos of their lectures for students to watch. Is the increase of technology in the classroom actually helping students be active members of the education process?

Purpose of the Project

The purpose of this project is to identify the positives and negatives of technology in the classroom. There was also an investigation into the use of technology to increase student engagement.

Delimitations

Delimitations of this project include high school students from middle to low socioeconomic status. These students come from a wide range of exposure to technology in and out of the classroom.

Assumptions

1. Students and staff have basic knowledge of the technology that they are using in the classroom.
2. Students are aware of teachers trying to incorporate technology into their classes.

Hypothesis or Research Question

Teachers who incorporate technology into their classes, including computers, tablets and cellphones show a correlation in student engagement. By incorporating technology, students may be more engaged in the lessons being presented to them.

Null Hypothesis

The null hypothesis of this project is that the use of technology in the classroom does not show a statistically significant correlation with student engagement.

Significance of the Project

The purpose of this project may be used as information to see if the purchase of technology in the high school has shown any effect on the engagement of students. The survey may show the feelings and opinions of students who are currently using the technology and their beliefs on whether the technology is an asset to their learning. If technology does not help increase student engagement, then the district will have invested money into a program that doesn't have any significance for the students when it comes to engagement in the classroom.

Procedure

The steps that were taken to complete the project are as follows:

1. A review of literature on the topic of student engagement and technology in the school setting.
2. A technology use survey was created using Google Docs
3. The link to the survey was given to all Career and Technical (CTE) teachers with technology in their classrooms. 192 students responded.
4. Data from the survey was compiled, analyzed, and evaluated.
5. The summary, conclusion, and recommendations were made to complete the project.

Definition of Terms

Engagement: Engagement is when a person, in this case, a student is present with the context of class.

Likert Scale: Numerical scale used for a survey that includes a range response that goes from strongly agree to strongly disagree.

Personal Electronic Devices: Personal Electronic Devices are any technology that a student or teacher can use as an individual, whether a tablet or cell phone.

Tablet: A tablet is a portable computer that can be used for personal or educational use.

Acronyms

CCSS: Common Core State Standards

CTE: Career and Technical Education

OSPI: Office of Superintendent of Public Instruction.

PED: Personal Electronic Device

CHAPTER 2

Review of Selected Literature

Introduction

By the year 2014, society had adapted to the use of different forms of technology, from a point of sales system to a cell phone being used to place a phone call. According to a study conducted by Madden, Lenhart, Duggan, Cortesi, & Gasser (2013) "9 in 10 teens have a computer or access to one at home"(p. 1) and "78% of teens now have a cell phone … [and] those who fall into lower socioeconomic groups are just as likely and in some cases more likely than those living in higher income and more highly education households to use their cellphones as a primary point of access" (p. 1). Teenagers in this decade were surrounded by technology and constantly utilizing it to stay connected.

No matter what a student's background was, they could be expected to be aware of technology and know how to use it to fulfill their wants and needs. The increase of available technology allowed students have an even playing field when it came to their education. As the Madden et al. (2013) stated, high or low socioeconomic status no longer had an impact on students' exposure to the internet; just on their means of accessing it.

Technology led to a new way for people to be engaged in their world, including the education process. Madden et al. (2013) discovered in their studies

of students' smartphone use that the persistence of smartphones created an atmosphere where, "95% of teens are online, a percentage that has been consistent since 2006" (p. 1). Knowing that the chances for a decline in teenage use of technology were very unlikely, how were educators using this resource as a way to engage their students in their content and the education process?

This chapter has examined the following topics: (a) student engagement, (b) technology in the classroom, and (c) technology and its effect on student engagement.

Student Engagement

In the education setting, "academic engagement [has been identified] as one of the primary predictors of high achievement in school(s)" (Park, Holloway, Arenetdz, Bempcehat, Li, p. 391, 2011). Researchers found that when a student was engaged in his or her learning, it could help fill a psychological need to feel competent (Park et al, 2011). In the study conducted by Park et al (2001), the effects of engagements (specifically, the emotional engagement of a student) were measured to determine success in the classroom. The engagement of a student could change due to outside influences (Park et al, 2011).

A struggle that researchers have found in the study of student engagement is to be able to work with students who are not trying to "do school" in a way that they are doing what they need to for achievement (Yoneawa, Jones, &

Joselowsky, 2009). Views on engagement changed throughout the years. To become more multi-dimensional, studies looked for connections between many different behaviors and emotional engagements.

The Center for Educational Leadership at the University of Washington created a framework titled, "5 Dimensions of Teaching & Learning" that included student engagement. The framework discusses how "engagement strategies capitalize on and build upon students' academic background, life experiences, culture and language to support rigorous and culturally relevant learning" (CEL, 2012). For students to truly engage in their learning, it needed to be relevant to their lives and personalities. When learning tapped into student interest, there was an increased level of buy-in, as students could connect to what they were learning and were therefore more eager to further their education (CEL, 2012).

Student engagement looked different from class to class, but it still had the same purpose. Fink and Markholt (2011) asserted that student engagement should show intelligent work where students understood the purpose of their tasks and were encouraged to express their thinking.

According to Trowler (2010), student engagement could be shown in different forms. Trowler (2010) stated that there were three dimensions of engagement: behavior, emotion, and cognitive (p. 5). In each dimension, signs of engagement included behaviors like attending classes, being an active participant and seeking information beyond the topics covered in class (Trowler, 2010). All

of these behaviors of engagement could be read as positive or negative, but all are nonetheless considered forms of engagement in the classroom (Trowler, 2010).

As addressed by Trowler (2010), "student engagement is the responsibility of both students and their institutions" (p. 16) Engagement is not only the student's responsibility, but also the teacher's. The article "Understanding and Promoting Student Engagement in University Learning Communities" by Kerri-Lee Krause (2005) addressed that there were ways to enhance students engagement in their classes. The list of principles by Krause (2005) included, "create and maintain a stimulating intellectual environment" (p. 12) and also encouraged teachers to "acknowledge the challenge" (p. 13). Both of these points discussed how the teacher needed to encourage students to be active in their learning and that, as a teacher, they needed to understand the frustrations that can come along in the education process. (Krause, 2005) For a truly engaged classroom, student and teacher are working together to create an environment that encourages students to be active in their learning.

Technology

In 2014, different types of technology were found in a variety of classrooms around the world. It was no surprise to see that, in classrooms in the 21st century, a teacher would often have a computer connected to a projector, computers or tablets available for student use, and increased wireless Internet

around the school building. It was used as a way to "instruct students, handle administrative tasks, and correspond with parents" (Hirose, p. 2, 2009). With the adaption of new educational standards like the Common Core State Standards (CCSS) (2010), it was predicted that there would be more technology use in the everyday classroom. Stated in the CCSS (2010) for English Language Arts and Literacy in History/Social Studies, Science, and Technical subjects, students who "use technology and digital media strategically and capably" are identified as being college and work-bound (p. 7). The state of Washington told students that technology was an integral part of the education process and their future careers. Working with technology could help the students create connections with their work to the real world (Hirose, 2009).

Technology was not a foreign concept to 21st century students. Hong, Hwang, Hsu, and Chen (2012) identified that students "interact with computers in all setting almost every day." (p. 255) Most students had been exposed to all facets of what technology could offer and knew that when it came to technology, "playfulness and learning can be viewed as two ends of a continuum" (Hong et al, p. 255, 2012). Hong et al. (2012) conducted a study that concluded that technology, in the form of an online game, could be a successful tool in the learning process and decreased the anxiety of the students participating.

According to a study by Bonds-Raacke and Raacke (2008) that looked at the use of Tablet PCs in a classroom, the "students reported that the use of

technology not only enhanced the classroom experience, but that they benefited from the use of technology" (p. 238). The students were able to acknowledge that the use of the technology was a useful tool to their success in the classroom. The students in the study did identify that the instructor's knowledge of the technology use was essential also to reap the potential benefits. (Bonds-Raacke & Raacke, 2008).

However, some researchers also found that the availability of different technology in the classroom could have a negative effect on the education process. Froese, Carpenter, Inman, Schooley, Barnes, Brecht, and Chacon (2012) conducted a study about the use of cell phones in the classroom and the expected and actual learning that happened. Froese et al. (2012) discovered that their "data confirm[ed] that students expect texting to disrupt their classroom learning and that texting does disrupt their learning" (p. 329). This research showed that technology could be a disturbance to the learning process when used out of context, but when used for class purposed can be an asset.

Technology and Its Effect on Student Engagement

Researchers found that the use of technology in the classroom could create more student-driven lessons and a less teacher-driven classroom environment (Jenkins, Mimbs, Kitchel, 2009). In this study, Jenkins, Mimbs, & Kitchel (2009) discovered that "by utilizing various types of technologies within the classroom,

teachers are better able to meet the learning needs of more students as well as keep them engaged in the lesson" (p. 9). This gave the students the chance to work at a pace that could help them be more successful.

To address the lack of growth in student scores on state and classroom assessments in the subject of reading, Ernest Fleishman (2004) did a study incorporating the Scholastic program READ 180 that uses "technology to constantly monitor and adjust the instruction for each individual student" (p. 2). READ 180 used technology to keep students active in their learning to help build on their prior knowledge at a pace that fit their level. Hasselbring and Goin (2004) discussed how the READ 180 technology needed to "be relevant and intrinsically motivating" (p. 5) for students to be engaged in their learning of reading. In their research, Hasselbring and Goin (2004), found that "the capacity of technology [can] afford students the instruction and practice they need to become fluent, understanding readers" (p. 20). Technology has been used as a tool to increase the engagement of students in the classroom by adapting the reading to fit the students' needs and build on their prior learning (Hasselbring & Goin, 2004).

The beginning of the 21st century lead to a strong push for technology use in the classroom, especially for Career and Technical Education teachers (Kotrlik & Redmann, 2009). A study conducted by Crichton, Pegler and White (2012) titled "Personal Devices in Public Settings: Lessons Learned from and iPod Touch/iPad Project", discussed how the use of technology could be very

successful for student engagement. However, for the integration to run smoothly and the maximum level of engagement to be achieved, the student, teacher, and IT team needed to receive quality training (Crichton, Pegler & White, 2012).

Hattie (2009) identified in his book Visible Learning that, "studies compare teaching in classes with and without computers … rather than comparing students learning in different ways when using computers." (p. 221) Hattie (2009) found that, "the use of computers is more effective when the student, not the teacher, is in the 'control' of learning." (p. 225)

Technology use in a classroom was not always identified as the best choice to help with student engagement. Wu and Huang (2007) conducted a study that compared a student-centered classroom that included use of technology and a teacher-centered classroom. Wu and Huang (2007) concluded that the class that was student centered was comprised primarily of "low-achieving students" who "did not receive direct support from the teacher that could constantly draw their attention to the content" (p. 747). This suggested that technology integration could become more of a deterrent to the learning process for students who already struggled in class if they were not properly engaged.

Hattie's (2009) study pointed out that teachers tended to assume that their students would be able to perform certain tasks and objectives due to their level of education. Students were expected to be able to stay on task when they were put in front of a computer or given a tablet. In these situations, the teacher needed to

be clear about the objectives with the students rather than relying on the technology to do all the teaching. Hattie (2009) stated that "teacher clarity could have a large effect on student success in the education process" (p. 126). This clarity on tasks and explanations was a necessary link for technology to be used effectively to increase engagement.

Summary

Student engagement was viewed in a variety of dimensions when it came to student success. Researchers agreed that engagement could be looked at through different lenses, but they all lead to the idea that student success occurred when a student was truly engaged. The engagement that was happening was ideally both student- and teacher-centered to be truly successful. The engaged student is an active participant in the classroom and works with the teacher to create an environment for growth and learning (Krause, 2005). This engagement can include the use of technology for the student and teacher to help with growth and learning.

Technology was identified as a teaching tool that educators needed to embrace and use to their advantage. As stated above, CCSS (2010) required students to be efficient in their use of technology to help further their skills outside of the classroom. Research also found that technology was useful in updating lessons

and creating the real-world connections students needed to help them understand concepts in class.

Overall, researchers suggest that technology is an extremely useful and valuable tool in increasing student engagement.

CHAPTER 3

Methodology and Treatment of Data

Introduction

This chapter will focus on the methodology of how the project was completed. First, permission was given by the Career and Technical Director of the district to survey students for the research. Background research was conducted to create survey questions and reviewed by the teacher-researcher's peers to limit potential bias from students.

Methodology

A review of literature was conducted for the basis of this project that included using Heritage University's Library system and the Internet. The project was completed quantitatively using a cross-sectional survey on students enrolled in CTE classes. According to Gay, Mills, and Airasian (2012), "a cross-sectional survey is one in which data are collected from selected individuals at a single point in time" (p. 184-5). The teacher-researcher asked students to take the survey once during a weeklong time period.

Participants

The participants of this project were high school students ranging from 9th to 12th grade that were enrolled in a CTE class. The CTE classes were chosen for

their incorporation of technology in their daily class routine. The school population consisted of students that were seventy-seven percent Hispanic and seventeen percent Caucasian, with the remaining six percent covering other races. Seventy-five percent of the student population is on free or reduced lunch, which allows us to conclude that the majority of the student population falls near or below the poverty line.

Instruments

The teacher-researcher created a survey using the Likert Scale. The Likert scale uses responses that range from strongly agree to strongly disagree and gives each response a numerical value to it (Gay, Mills, and Airasian, 2012). In this survey was then was given to students to get opinions about their use of technology in the classroom. The teacher-researcher used the program Google Documentss as the way to distribute the survey to the students.

The teacher-researcher reviewed the survey questions to determine validity so that data collected would correlate with the hypothesis. According the Gay, Mills, and Airasian (2012) the validity is, "the degree in which a test measures what it is intended to measure" (p. 633) Survey questions were created to insure that the focus was on technology and engagement in the classroom.

Design

The teacher-researcher created a survey comprised of twelve questions regarding the use of technology in the classroom. The teacher-researcher used a Likert Scale to evaluate the responses from the students with 1 being strongly agree and 5 being strongly disagree. The survey included questions that included: previous knowledge of using technology, training from teacher in use of technology, and did they enjoy using technology in the classroom. Survey was reviewed and edited by colleagues before being distributed to students in CTE classes.

Procedure

The teacher-research created the survey using Google Documents to create a single generation source to collect survey results from students. The link to the survey was emailed to CTE teachers on a Friday afternoon with directions to give the survey to students during their entry task time. CTE staff was instructed to share with students that it was a voluntary survey and it was not mandated that their students participate. There was a one-week window were the survey link would be active for students. On the second to last day that they survey link was live, the teacher-research emailed the CTE teachers, asking them to remind their students that they had one more day to participate and then the link would be

closed. Once the survey time period was closed, the teacher-researcher compiled all the results onto a master excel document to analyze.

Treatment of the Data

The data from the student surveys was stored in a master excel document on a secured computer. The data was put through statistical tests using Excel 2010. The teacher-research interpreted the data according the research question: Is there significant correlation between the use of technology in the classroom and student engagement?

Summary

To address whether the use of technology in the classroom and student engagement is correlated, the teacher-researcher created a survey to give to students who are currently enrolled in CTE courses. The survey was designed to query unbiased views about technology from high school students who are using it in their classes on a daily basis. Students had a one-week time period to take the survey before results were collected and stored in Excel. The teacher-researcher then analyzed and interpreted the result to address the research question, which asks: Is there significant correlation between the use of technology in the classroom and student engagement?

CHAPTER 4

Analysis of the Data

Introduction

Research was conducted by the teacher-researcher who wanted to see students' responses to how technology may affect their engagement at their school. A survey using a Likert scale was offered to CTE Students to voluntarily take when enrolled in classes that utilize technology on a daily basis. Students had a 5-day time frame to take the survey.

Description of the Environment

The project was conducted in a low socioeconomic high school in Lower Eastern Washington. The teacher-researcher distributed the survey using the Google Documents to all CTE teachers in the building. The teachers were asked to volunteer their entry task time to have all their classes throughout the day complete the survey. Students were given a one-week time period to complete the survey.

Hypothesis/Research Question

Teachers who incorporate technology into their classes, including computers, tablets and cellphones (use technology in their classrooms) will have students who report greater student engagement. This will be measured by

evaluating the statistical significance of the correlation at $p \leq .05$. By incorporating technology, students will report being more engaged in the lessons being presented to them.

Null Hypothesis

The null hypothesis of this project is that the use of technology in the classroom does not show a statistically significant correlation with student engagement.

Results of the Project

Entire Data Set

The teacher-researcher used the Excel 2010 to find the Pearson R results. Tables 1 through 4 show the relationships for specific questions using the Likert scale, with 1 being strongly agree and 5 being strongly disagree that were included on the survey. There were a total of 192 (n=192) students that were surveyed.

Table 1:

	Technology helps me get my work done in class:	*I enjoy using technology in my classes to do my school work:*
Mean	2.15625	1.916666667
Variance	1.273887435	1.406631763
Observations	192	192
Pearson Correlation	0.709884225	
Hypothesized Mean	0	

Difference		
df	191	

Table 2:

	Technology helps me get my work done in class:	*Technology has helped me achieve better grades in my classes*
Mean	2.15625	2.364583333
Variance	1.273887435	1.31140925
Observations	192	192
Pearson Correlation	0.611911552	
Hypothesized Mean Difference	0	
df	191	

Table 3:

	Technology helps me get my work done in class:	*I use technology to look up concepts from class that I do not know:*
Mean	2.15625	1.869791667
Variance	1.273887435	1.359920375
Observations	192	192
Pearson Correlation	0.560498717	
Hypothesized Mean Difference	0	
Df	191	

Table 4:

	Technology has helped me achieve better grades in my classes	*I enjoy using technology in my classes to do my school work:*
Mean	2.364583333	1.916666667
Variance	1.31140925	1.406631763
Observations	192	192
Pearson Correlation	0.650826902	
Hypothesized Mean	0	

Difference	
df	191

The teacher-researcher used a 95% ($p \leq .05$) confidence level when analyzing data and was willing to accept that there could be 5% difference due to chance. After looking at the results for p in all of the tables, all but Table 4 suggested that the two variables had a robust and significant correlation.

Separated Data Sets

The teacher-researcher separated all students who marked Mostly A's and D's or lower as their grades from the data set and ran the same test to find the Pearson R to see if there would be a difference between high achievers and low achievers and how they viewed technology and it's engagement. Tables 5 through 12 show a small sample of the total students surveyed with 66 students claiming to receive Mostly A's in their classes and 18 students claiming to receive D's or lower.

Table 5: Mostly A's

	Technology helps me get my work done in class:	*I enjoy using technology in my classes to do my school work:*
Mean	2.212121	1.924242
Variance	1.585082	1.548019
Observations	66	66
Pearson Correlation	0.668449	
Hypothesized Mean Difference	0	
df	65	

Table 6: Mostly A's

	Technology helps me get my work done in class:	*Technology has helped me achieve better grades in my classes*
Mean	2.212121	2.333333
Variance	1.585082	1.394872
Observations	66	66
Pearson Correlation	0.675972	
Hypothesized Mean Difference	0	
df	65	

Table 7: Mostly A's

	Technology helps me get my work done in class:	*I use technology to look up concepts from class that I do not know:*
Mean	2.212121	1.878788
Variance	1.585082	1.554312
Observations	66	66
Pearson Correlation	0.447898	
Hypothesized Mean Difference	0	
df	65	

Table 8: Mostly A's

	Technology has helped me achieve better grades in my classes	*I enjoy using technology in my classes to do my school work:*
Mean	2.333333	1.924242
Variance	1.394872	1.548019
Observations	66	66
Pearson Correlation	0.677036	
Hypothesized Mean Difference	0	
df	65	

Table 9: D's or Lower

	Technology helps me get my work done in class:	*I enjoy using technology in my classes to do my school work:*
Mean	2.166667	1.777778
Variance	1.205882	1.124183
Observations	18	18
Pearson Correlation	0.740989	
Hypothesized Mean Difference	0	
df	17	

Table 10: D's or Lower

	Technology helps me get my work done in class:	*Technology has helped me achieve better grades in my classes*
Mean	2.166667	2.444444
Variance	1.205882	1.202614
Observations	18	18
Pearson Correlation	0.862959	
Hypothesized Mean Difference	0	
df	17	

Table 11: D's or Lower

	Technology helps me get my work done in class:	*I use technology to look up concepts from class that I do not know:*
Mean	2.166667	2.111111
Variance	1.205882	1.398693
Observations	18	18
Pearson Correlation	0.709601	
Hypothesized Mean Difference	0	
df	17	

Table 12: D's or Lower

	Technology has helped me achieve better grades in my classes	*I enjoy using technology in my classes to do my school work:*
Mean	2.444444	1.777778
Variance	1.202614	1.124183
Observations	18	18
Pearson Correlation	0.747616	
Hypothesized Mean Difference	0	
df	17	

The teacher-researcher used a 95% ($p \leq .05$) confidence level when analyzing data and was willing to accept that there could be 5% difference due to chance. The P values for all but Table 6 and Table 11, in the Mostly A's and D's and Lower survey research showed to have correlation.

After reviewing the data, the teacher-researcher is able to reject the null hypothesis that technology does not have a correlation on student engagement for this project. With the robust correlation in the data sets, the teacher-researcher can assume the strong correlation between student engagement and technology may be worthy of future investigation to discover the relationship between the highly correlated variables.

Findings

The teacher-researcher was able to show in the data that there is a robust correlation between student's use of technology and their engagement in the class

through the data presented in the tables. Table 1 through 3 showed a P value with a less than 1% degree of chance when the teacher-researcher was willing to take a 5% chance. When looking at Tables 1 through 3, the teacher-research can suggest that for these classes technology is having an effect.

Looking at the separated data that consists of students marked Mostly A's and D's or Lower as their grades, there was a change in correlational data compared to the entire set. Comparing Tables 1, 5 and 9 showed that students who marked Mostly A's (Table 5) P value aligned with the entire data set (Table 1) of a less the 1% of chance while the D's or Lower (Table 9) showed the accepted 5% of chance.

Data between the different sets that had a big difference was comparing Tables 2, 6, and 10. When looking at if technology helped get work done correlated with technology helping achieve better grades, the students who marked Mostly A's (Table 6) showed no true significant correlation. All three of these tables showed that the correlation between responses was not significant enough for the project.

Discussion

The purpose of the project was to see if teachers who utilize technology in their classrooms, there would be a higher level of student engagement in their classes. With the results from the sample taken by the teacher-researcher, in the

classes that were surveyed, the teacher-researcher found a significant correlation between technology and student engagement.

After completing the project, the teacher-researcher felt that the results of the project are consistent to similar studies about technology and student engagement. The research conducted by Crichton, Pegler and White (2012) discussed that with equal knowledge by teacher and students in the school building there can be success with student engagement. The teacher-researcher would agree with this research from their findings.

Even though the small sample of this project showed that technology may have some effect on student engagement, however the teacher-researcher acknowledges the limitation that this was a small sample of students in a specific content area and that this project was limited to determining whether or not a statistically significant correlation was present. A larger sample of students and data collected from a broader group of students may be more informative.

Summary

The teacher-researcher evaluated the results of a survey given to 192 students enrolled in CTE courses to better understand the students' feelings about technology and their engagement. After analyzing the data collected using Excel 2010, the teacher-researcher was able to assume that in this sample, technology and student engagement did have a strong correlation. Using a confidence level of

95% ($p \leq .05$) many of the correlations between the questions surveyed showed a 99% ($p \leq .001$) confidence level that the variables were statistically correlated (the small P-value suggests that less than 1% of the result was due to chance).

With review of the data, the teacher-researcher would state that with results that show less then 1% of the data being of chance, there is a robust and significant correlation for technology and student engagement. The teacher-researcher wondered in their hypothesis that by incorporating technology in instruction would students be more engaged in the lessons being presented to them? The results of the project suggest that, in this small group of students sampled, that technology in instruction is highly correlated to student engagement.

CHAPTER 5

Summary, Conclusions and Recommendations

Introduction

The use of technology in the classroom has become a common use among high schools today. Schools are looking for ways to help students becoming engaged in their classwork to increase achievement on state testing. Technologies, like tablets, computer, and PEDs have been looked at as the possible answer to getting students to be engaged.

Summary

With technology becoming a daily part of the 21st century, there have been many schools trying to utilize it to help with student engagement. There are many programs that include the use of computer, tablets, and PEDs in the student's daily class life in the hope that students will be more engaged in their classwork.

The teacher-researcher wanted to look at possible correlations between technology used in school and so-called student engagement. The research question: Is there a correlation between the use of technology in the classroom and student engagement? The teacher-researcher created an online survey to ask students about their use of technology and if they think they are more engaged in

their classes. The survey was created using Google Documents and reviewed to limit bias. The link to the survey was emailed to CTE teachers in a low-socioeconomic high school for voluntary participation that use technology day to day to share with their classes. The link was active for a week for students to take the survey and then when closed, data was collected and analyzed.

The teacher-researcher reviewed and analyzed the data to discover the level of correlation between technology and student engagement. With results that showed less than 1% ($p \leq .001$) of chance, the teacher-researcher was able to state that there was a robust and statistically significant correlation. The results of the survey led the teacher-researcher to state that in the small sample taken, the hypothesis that technology is highly correlated with student engagement.

Conclusions

Based on this project, the teacher-researcher wonders if, in some cases, technology can have an effect on student engagement? As discussed previously, Crichton, Pegler and White (2012) talk about how use of technology can be very successful for student engagement. With the knowledge that a broader project would be needed to make larger assumptions about student engagement and technology, the teacher-researcher wonders if it might show a similar strong correlation between technology and student engagement?

Recommendations

Based on the conclusions above, the teacher-researcher would suggest expanding the project to include a wider range of students. While the small section of students was adequate to see correlation in a specific program (CTE), the teacher-researcher would recommend for future research that asking the entire student body of the high school or all high school students in the district take the survey might be informative. The broader range of participants may give the teacher-researcher a better understanding of how technology may affect student engagement.

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APPENDIX

Technology Survey

Please fill out the following survey to the best of your knowledge. It should only take a maximum of 5 minutes to complete. For the purpose of this survey, technology is any computer-based device you may use that includes: Computers, Laptops, Tablets/iPads, Cell Phones.
*Required

My grades are: *Mark only one oval.

- o Mostly As
- o Mostly Bs
- o Mostly Cs
- o Mostly Ds or Lower

Technology helps me get my work done in class: *Mark only one oval.

1 2 3 4 5

Strongly Agree Strongly Disagree

I use technology to look up concepts from class that I do not know: *Mark only one oval.

1 2 3 4 5

Strongly Agree Strongly Disagree

I enjoy using technology in my classes to do my school work: *Mark only one oval.

1 2 3 4 5

Strongly Agree Strongly Disagree

My teacher has taught me how to us the technology in our classroom for school work: *Mark only one oval.

1 2 3 4 5

Strongly Agree Strongly Disagree

I find technology in the classroom distracting: *Mark only one oval.

1 2 3 4 5

Strongly Agree Strongly Disagree

I am uncomfortable using technology in my classes: *Mark only one oval.

1 2 3 4 5

Strongly Agree Strongly Disagree

Technology has helped me achieve better grades in my classes * Mark only one oval.

1 2 3 4 5

Strongly Agree Strongly Disagree

How many of your current classes use technology on a regular basis?
(ex: using the computer for assignments 3 times a week.) *Mark only one oval.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8

Do you use you phone to access the internet for class related purposes? * Mark only one oval.

- Yes
- No

How many hours a week on average are you using the following outside of school:
*Mark only one oval per row.

	1-2 Hours	3-4 Hours	5-6 Hours	7-8 Hours	Not Applicable
Cell Phone					
Computer/Laptop					
Tablet/iPad					
MP3/iPod					

What tools have you used in your education experience? * Choose all that apply

- Edmodo.com
- Khan Academy
- Presentation Programs (PowerPoint, Prezi, etc)
- Word Collage Software (Wordle, Tagxedo, etc)
- Moodle
- iPad/Tablet
- Cell Phone
- MP3
- Remind101
- CoolMathGames.com
- FreeTypingGames.com
- Library Website
- Wikipedia
- Search Engines (Google, Yahoo, MSN)
- Images Sites (Google Images, Yahoo Images, etc)
- Blogging Websites (Blogger, Blog Spot, Pintrest, etc)
- Word Processor (Word, Open Office, Pages, etc)
- Microsoft Excel
- Microsoft Publisher
- Other