BENEFITS OF CURRENT EDUCATIONAL TECHNOLOGY: A COMPARISON OF STUDENT AND TEACHER PREPARATIONS IN A RURAL ILLINOIS SCHOOL DISTRICT

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ABSTRACT
With an ever-increasing push towards educational technology use, much emphasis has been placed on the implementation of technology programs in today's classrooms. The purpose of this study is to identify and compare teacher and student perceptions of educational technology use in a small, rural school district in central Illinois. Participants were asked to complete an electronic survey to collect quantitative and qualitative data about their perceptions of educational technology in the school district. Via a combination of descriptive analyses and independent sample t-tests, data was compared across school buildings and between student and teacher samples. It was determined that there are not currently major discrepancies between teacher and student perceptions of educational technology use in the participating district. Results have implications for only this school district suggests that district officials do not need to alter policies or practices regarding educational technology at this time.

INTRODUCTION
Unlike a few decades ago, when it was common for classroom technology to be limited to a single overhead projector and a shared television on a rolling cart, the quantity of devices currently available for use in an educational setting is staggering. In 2010 the National Center for Educational Statistics reported that over 95% of classrooms possessed at least one computer and almost all of these computers had internet access. In the few years since the collection of this statistic, there is no doubt that there has been an increase in the availability of devices for use in the classroom as large quantities of school districts throughout the United States have shifted to employ a 1:1 student to device environment. The far-reaching utilization of devices, such as laptops, tablets, and mobile technologies, is redefining the roles of both students and teachers throughout the learning process and are having a dramatic impact on the field of education.

Also altered by national initiatives, such as the implementation of the Common Core State Standards during the 2013-2014 school year and the correlating Partnership for Assessment of Readiness for College and Careers (PARCC) assessment, the teaching, learning, and assessment processes are growing increasingly dependent on the use of technology in an educational setting. National content standards, such as the Common Core State Standards (2010), Next Generation Science Standards (2013), and the C3 Framework for Social Studies State Standards (2013), all have technological elements embedding within. In order to fully meet the educational goals listed in these standards, the use of technology in the classroom setting is necessary. In an attempt to help schools across the United States finance the procurement of devices and improve their internet connections, various federal programs, such as the Investing in Innovation Fund (2009) and the ConnectED Initiative (2013), have been implemented.

Illinois, too, has taken many steps to ensure that technology is being utilized in classrooms in a way that benefits students. Since 2002 Illinois has suggested adherence to the National Educational Technology Standards (NETS) set for teachers, students, and administrators by the International Society for Technology in Education (ISTE). The adoption of the NETS by the state suggests that there is an emphasis on student growth in six areas of technology competency and that all Illinois schools will help students to meaningfully use devices in a manner that encourages the acquisition of 21st century skills. In supporting Illinois school districts, the Learning Technology Centers of Illinois have aimed to provide services and coaching since 1995 and attempt to address the expanding technological needs of Illinois schools as we progress further into the 21st century (2014).

In keeping with national and state trends, school districts have had to make significant efforts to provide devices and internet connections to students for use during the learning process (Project Tomorrow, 2015). This study's research site, a rural, public school district in Central Illinois, is no exception to this trend. Since the beginning of the 2013-2014 school year, this school district has made great attempts to ensure that the use of educational technology has

been a priority. Among these efforts the school district has worked directly with a consulting firm, offered over 20 professional development opportunities to teachers ranging from kindergarten to high school, has offered $20,000 in iPad grants to district employees, and has added two computer labs and various additional wireless routers throughout district buildings (J. Baughman, personal communication, September 2, 2015). Additionally, grades five and up utilize a BYOD (Bring Your Own Device) policy to make up for the fact that the district is currently unable to facilitate a 1:1 student to laptop environment.

With such an emphasis on technology, there has been very little comparison of teacher perceptions of technology use and student perceptions of the teaching and learning processes, particularly on a district-by-district basis. Districts, like study's research site, are addressing ISTE standards, but are left to wonder if teachers' day-to-day technology efforts and the district's initiatives are as beneficial to students as is hoped. This study is intended to highlight discrepancies in teacher and student views of educational technology use and benefits in the school district school district through addressing the following research questions:
1. How are students and teachers utilizing technology in the classroom setting?
2. How do student perceptions of technology in the district compare to teacher perceptions?

While much emphasis is being placed on increased technology use and teacher professional development, little has been done in the district to gauge if students feel they are benefitting from these initiatives. The results of this study will be of interest to teachers, particularly in grades 5-8, of the participating school district and can be used to identify technological gaps that are occurring in the district. Additionally, results will allow district officials to determine whether or not the technology initiatives are yielding the desired academic benefits for students.

METHDOLOGY
This study will employ a mixed methods design. Via an online questionnaire, students and teachers will respond to a series of both quantitative and qualitative questions about the availability of technological devices in the classroom setting as well as their perceptions of the use of such devices. A mixed methods design is chosen for the study as both quantitative and qualitative data will be collected through participant completion of the electronic questionnaire. In particular, a mixed method approach, combining both quantitative and qualitative data, has been chosen because of the necessity to quantify student and teacher perceptions for comparison.

Participants
The participants for this study consist of teachers and students from a rural school district in Central Illinois. This school district is composed of three schools, employs 65 certified teachers, and serves approximately 805 students (Illinois Report Card, 2014). Of the three district schools, this study will only be conducted in the elementary school and junior high school. Both of these schools serve primarily Caucasian students, at 95%, and approximately 25% of the students in both schools are considered low income students (Illinois Report Card, 2014). The elementary school serves students in Pre K to sixth grade while the junior high consists solely of seventh and eighth graders.

For this study 30 elementary students, 15 from fifth grade and 15 from sixth grade, were invited to participate. These students were randomly selected from the three distinct classes at teach grade level. As there are 120 students enrolled in fifth and sixth grade at the elementary school, this sample represents almost one fourth of the student population. Similar to the student sample at the elementary school, 30 students from the junior high school were also invited to participate in this study to represent the 130 students enrolled.

In addition to students, this research study also includes teachers from the district. In the elementary school setting all classes are self-contained and these teachers are responsible for the delivery of all core content. Five classroom teachers, three from fifth grade and two from sixth grade, were invited to participate in this study. Unlike the elementary school setting, the junior high building is departmentalized by content area. All five of the junior high content area teachers were invited to participate in the study.

Ethical Considerations
Informed consent will be obtained from all participants of this research study. Teachers have been assured that their individual responses will not be provided to administrators and will have no impact on their evaluation process. Students have also been informed that their participation is completely voluntary and that there will be neither academic reward nor punishment should they choose not to participate. Participants have all been informed that their questionnaires will be anonymously submitted.

Because of the small size of the district and sample, particularly among teachers, there is a risk that teachers will be hesitant to provide truthful information on this questionnaire. Additionally, teachers may feel obligated to participate, even if they do not truly desire to, because the researcher is a member of the teacher population that will be included in this research.

Instrumentation
Participant responses will be collected via an electronic questionnaire that will be distributed via district issued email accounts. Two versions of the questionnaire will be utilized, one for teachers and one for students. While these two versions will be essentially the same, some language will need to be altered to reflect the roles the participants play in the classroom. Both surveys have been validated by a Panel of Experts.

The questionnaire will contain a series of yes/no, closed ended questions and various Likert scale items. The yes/no questions, asking about availability of technology in various locations, will permit the comparison of resources available outside of school setting to both teachers and students. The 19 Likert scale questions, used to identify participant perceptions of educational technology, will require participants to indicate their levels of agreement on scale ranging from 1 to 5. The Likert scale being utilized throughout the entire survey addressing attitudes towards technology in the classroom will range from 1: strongly disagree, 2: disagree, 3: neither disagree nor agree, 4: agree, to 5: strongly agree.

These questions, meant to gauge student and teacher attitudes toward technology use in an educational setting, are separated into two categories. The first category deals with students' attitudes of technology availability, instruction, and teacher knowledge in the participating school district. The second category of Likert scale questions is meant to identify student and teacher attitudes towards technology and the learning process. With a focus on student learning, this section of both the student and teacher surveys will require participants to rate their level of agreement from strongly disagree to strongly agree with statements such as "students want to participate more in class when they get to use technology". The intentional inclusion of only positive items during the Likert scale portions of the surveys was done to avoid inverted scoring during the data analysis process. Additionally, Solís Salazar (2015) points out that when only positive survey items are used validity and reliability are greater than in surveys where both positive and negative items are included.

Additionally, the questionnaire contains four open-ended qualitative questions. Participants will be asked to explain their thoughts and opinions on the benefits, drawbacks, concerns, and additional thoughts on technology use in district classrooms. The inclusion of these open-ended questions as part of the questionnaire process will permit data collection on participant thoughts that may go beyond the responses of the closed-ended questions.
1. What is the biggest benefit to using technology in school? Please explain.
2. Can you think of any situations where technology has prevented you from learning? Please explain.
3. What is one thing concerning technology use in the classroom that you wish our school did differently? Please explain.
4. Do you have any thoughts or concerns about our district's use of technology that you want to share?

All questions in the questionnaire are designed to identify student and teacher perceptions of educational technology use in grades five through eight so that the perceptions of student and teachers can be compared.

The only demographic data that will be collected from all participants is the building in which teachers work or students attend. This will help to identify any discrepancies across the two buildings and among the teacher and student participant groups. The teacher questionnaire will contain additional demographic items aimed to identify how long the participants have been teaching, their highest level of education, and whether or not they have participated in district provided or outside technology professional development opportunities.

Research Questions
1. How are students and teachers utilizing technology in the classroom setting?
2. How do student perceptions of technology in the district compare to teacher perceptions?

Limitations
There are several limitations to this study. First, this research study was only conducted at one school district in central Illinois and therefore results will likely only be applicable to this particular school district. Additionally, the

population of students and teachers at this school, a small, rural school district, is not reflective of other districts in the area, thus the findings are not likely to be transferable. The small size of the school district also limits the number of participants available in both the teacher and student participant groups. Finally, this research relies heavily on Likert scale questions and it is often difficult to determine the validity of these scales.

Data Analysis
The questionnaire being utilized is a Google form. As participants submit their responses, they will all be populated into a Google sheet. The functionality of this web based program is very similar to Microsoft Excel and all results can be downloaded in an Excel document for analysis. The quantification of student and teacher perceptions via the Likert scale items on the questionnaire, will allow the researchers to complete a descriptive analysis of the questionnaire results. This descriptive analysis of the quantitative data collected will provide information regarding central tendencies. After this initial descriptive analysis, data will be organized by school buildings. This will permit a comparison of data between student and teacher groups. In addition, student data and teacher data will be compared as a whole and by buildings. In making these comparisons independent sample t-tests will be utilized to compare means of various questions. In analysis of the open-ended questions, recurring themes will be identified. After analysis data will be displayed and organized in tables to assist with making sense of the results.

Literature Review
The increase in availability of devices and the push from both state and federal organizations has prompted a dramatic expansion of school districts' technological infrastructures. Through the ConnectED initiative, President Obama (2014) has issued a "challenge to connect 99% of students to next-generation connectivity within five years". Due to this and the wide support the ConnectED initiative has obtained, there is no doubt that there will continue to be an increase in device quantities and the access to reliable internet for students both in and outside of the classroom setting.

Such drastic changes in the educational world general elicit quite a bit of research. Four main categories related to technology integration can be identified and related to this study; they are one-to-one programs, the use of mobile devices in the classroom, teacher perceptions of technology integration, and student perceptions of technology use in an educational setting.

One-to-One Environments
The increased availability of technology has led to an increase in the availability of technological devices in the classroom setting. Because of this, many school districts have implemented a one-to-one student to laptop program. Such an increase in these programs has permitted quite a bit of research to be conducted on the effects of one-to-one implementation in the school setting. Of the benefits identified, one is increased access to word processing tools, research materials, and the ability to collaborate with among teachers and students. These are all skills that correlate with the ISTE student standards that are meant to help students to "learn effectively and live productively in an increasingly global and digital society" (ISTE, 2007). Additionally, one-to-one programs have the potential to positively affect learning environments and transform learning communities so that they are more learner-centered (Dunleavy, Dexter & Heinecke, 2007). Team building activities and student collaboration can be significantly enhanced through one-to-one implementation. Particularly in the middle school setting, one-to-one implementation supports the commonly utilized middle school model via the creation of team environments and encourages frequent interdisciplinary assignments and projects (Downes & Bishop, 2015). Because they encourage collaboration and provided for many means of communication, one-to-one programs can play a significant role in helping to establish a positive learning community (Downes & Bishop, 2015).

Despite the many benefits of implementing a one-to-one program, particularly in the middle school setting, there are many misconceptions of these programs. Many believe that one-to-one implementation automatically leads to better teaching and learning experiences, but this is not the case. One-to-one programs can serve as a means to transform teaching and learning process, but teachers and administrators must actively seek to transform classroom practices. The teaching and learning environments created by one-to-one implementation must be accompanied by practices of technology immersion in order to yield significant positive results. The use of one-to-one programs alone does not ensure technological superiority over other programs. Laptops have the potential to add value to the teaching and learning processes, but also have the potential to create classroom management issues (Dunleavy, Dexter & Heinecke, 2007). This potential is only unlocked when teachers and students are able to utilize the devices in a manner that does more than substitute laptops for paper and pencil assignments.

Mobile Device Use

It's no surprise that the increase in availability of mobile devices is affecting today's students and the ways in which they learn and interact with the world outside of the classroom setting. In 2013 it was estimated that approximately 65% of students in the United States grades six through eight routinely use smartphones (Project Tomorrow, 2013). Despite this increase in technology use outside of the school, many schools discourage the use of student-owned mobile devices in the classroom setting (Rivero, 2013). While this may currently be the norm, there are schools that are defying this trend and have implemented 'Bring Your Own Device' (BYOD) policies so that students have access to a technological device, particularly when the school does not have the means to adopt a one-to-one policy.

It has been suggested that the implementation of such policies, as opposed to one-to-one, has the potential to positively affect the teaching and learning process. The use of student-owned devices suggests increased student comfort with technology. As students increasingly use mobile devices outside of the classroom, it has been found that students who use personal mobile devices in the classroom report a higher level of comfort with the devices and applications for educational purposes. This is due to the fact that students who use their own mobile devices in the classroom are able to connect their knowledge of technology across multiple settings and can apply technological knowledge they acquired outside of the classroom setting to their learning (Swan, Van't Hooft, Kratcoski, & Unger, 2005). In addition to this increased transfer of technological knowledge, BYOD policies seen to increase student engagement and collaboration (Rivero, 2013). Mobile applications and access to online learning management systems (LMS) encourage students to work together and increase their nonlinguistic communication skills in and out of the classroom setting (Nielsen & Webb, 2015). This increased collaboration is not hindered because of the differences in student devices and generally relies on browser-based programs and applications that can be accessed by most devices (Raths, 2013).

Despite these benefits, the use of mobile devices in the classroom presents various obstacles to be overcome by teachers, administrators, and students. While the majority of students today have access to a mobile device, the use of a BYOD policy has the potential to draw attention to low income students, without devices and can expand any technology or learning gaps that already exist between them and their peers (Bruder, 2014). Additionally, the smaller size of mobile and other handheld devices presents a potential classroom management problem as students may be tempted to use the devices for non-school related activities and communications during the school day. In particular, this provides students with the opportunity to find ways around technology security settings to access social networking sites during the school day. This then has the potential to contribute to cyberbullying and other behavioral concerns throughout the school day (Bruder, 2014). Furthermore, the use of student-owned mobile devices creates an environment where devices have different functionalities and presents issues for teachers when it comes to problem solving with devices, particularly when they are unfamiliar with specific devices and their properties.

Teacher Perceptions of Technology

As with any change made to the teaching and learning processes, educational technology has elicited a variety of teacher perceptions. In particular, teachers have reported initial resistance and discomfort with changes related to technology implementation (Donovan, Hartley, & Strudler, 2007). Technology implementation is often perceived as a risky decision that reflects teachers' personal opinions of technology use. Teachers who have positive perceptions of one-to-one technology use are more likely to embrace the technological shift and attempt to utilize the devices with students. Similarly, teachers who feel negatively about technology or are concerned about the devices being distracting to students are more likely to avoid use of the devices (Howard, 2011). While a variety of positive teacher perceptions towards technology integration are often reported, negative perceptions are often overlooked and disregarded.

Regardless of teachers' initial opinions of technology implementation, it seems as if professional development related to technology has the potential to dramatically alter teacher perceptions of the implementation process. Teachers believe that they need opportunities to learn about ways in which instruction and assessment and classroom management procedures can be adjusted in order to effectively establish a classroom setting where technology is valuable to both them and students (Dunleavy, Dexter & Heinecke, 2007). The availability of professional development, whether offered by a school district or sought out by independent teachers, seems to be vital for the success of any technology program's implementation (Howard, 2011).   These professional development opportunities are necessary for teacher support of technology implementation and is supported by Thornburg's

(2014) statement that, "We make a big mistake when we think the new tools, by themselves, impact learning" (p. 30).

Even with sufficient professional development, teachers still have various concerns about using technological devices in the classroom. These concerns generally fall into two categories: technical and hardware concerns and classroom management matters. The first of these categories, technical and hardware concerns, deals primarily with teachers' perceptions that they are unable to fix devices or problem solve technical issues upon their occurrences. These concerns suggest a need for building or district wide technical support and routine device maintenance. Additionally, teachers worry about the logistics of wide-scale technology implementation in the classroom and whether or not devices batteries can last for an entire school day. For example, the locations of outlets in classrooms and how access to these energy sources may interfere with students' abilities to complete classroom assignments is a source of concern for teachers (Dunleavy, Dexter & Heinecke, 2007).

The second category of teacher concerns deals with the implications on classroom management procedures. Teachers recognize that the use of technological devices in the classroom adds another complex component to managing students' behavior and progress on assignments. Utilization of laptops or mobile devices in the classroom setting provides students access to a plethora of learning tools, but also has the potential to provide distractions and disruptions during the teaching and learning processes. In particular, the increased reliance on or availability of internet search engines gives students access to materials that are neither appropriate nor relevant to their coursework (Dunleavy, Dexter & Heinecke, 2007). This becomes an issue for all teachers, especially if teachers already struggle with classroom management, and is just one more aspect of student management to consider on a daily basis. Additionally, this suggests the need for schools, particularly those utilizing a BYOD policy, to create and enforce a set of rules for technology use in the classroom (Bruder, 2014).

Student Perceptions of Technology
As implementation of any technology program affects students' roles as learners and members of the classroom community, it is important to identify students' perceptions of technology use in the classroom. Seeing as today's students, particularly middle school aged students, have never experienced life without cellphones, laptops, and tablets, it is no surprise that students mostly report positive perceptions of technology use in the educational setting.

Students claim that using technology in class increases their engagement and desire to participate. This is due to the fact that students enjoy using technology, but is also due to the fact that students have increased comfort with technological devices because of their interactions with technology outside of the school setting. In describing students' comfort and desire to utilize technology in the classroom, it is reported that "75% of students think every student should have access to a mobile device during the school day to support learning" (Project Tomorrow, 2014). Students' positive attitudes towards this technology seem to influence the fact that they report low levels of anxiety when using tablets and other handheld devices in the classroom (Gorhan, Oncu, & Senturk, 2014).

Students have also reported that using technology gives them more ownership of their learning and allow them to be active participants in teaching and learning process, unlike settings where they cannot use devices (Baytak, Tarman & Ayas, 2011). The utilization of technology provides students with opportunities to demonstrate their learning and apply skills in ways that are not easily done with pencils and paper. Often times this new flexibility leads to increased creativity in the classroom and can bridge core content areas and the fine arts in a way that, again, intensifies students' engagement in the learning process (Vaidyanathan, 2012).

Despite their overwhelming positive perceptions of technology use in the classroom, studies suggest that students acknowledge the devices are only a resource for their learning, much like a calculator is a resource in math or textbooks have assisted in core content areas. Students see these devices not as their source of knowledge and learning, but as tools that can help them through the learning process (Swan, Van't Hooft, Kratcoski, & Unger, 2005). Most significantly, students have reported that they realize that it is the teachers and administrators who create their learning environments, not the use of technological devices, which have had the most influential impact on their perceptions of educational technology (Prettyman, Ward, Jauk, & Awad, 2012).

Results
Through the collection of both quantitative and qualitative data via electronic surveys, this study utilized a mixed method design. Two different versions of an electronic survey were distributed to teachers and students within the

participating school district. The purpose of this study was to identify middle school student and teacher perceptions of technology use in this School District. Both versions of the surveys were split into five sections to gather data about student and teacher attitudes and opinions of technology use in this particular school district. These five sections are: (1) demographics, (2) device availability at home and school, (3) attitudes towards technology in school, (4) attitudes towards technology and learning, and (5) open responses.

Participant Demographics

Of the 10 teachers that were asked to participate in the study, 9 completed the electronic survey. The teacher participant population was comprised of 56% elementary school teachers and 44% junior high teachers. Data table 1 highlights additional demographic information of the teacher participant population, such as participants' years of experiences and highest level of education.   The collection of teacher demographics also allowed teachers to communicate whether or not they have participated in professional development related to technology over the past two years.   It was discovered that 100% of teacher participants have participated in technology professional development offered by the school district. It was also found that 44% of the teacher participants have participated in technology related professional development outside of the school district.

Data Table 1: Teacher Participants' Demographics in a Central Illinois School District

Category	Number
Building of Employment	
Elementary School	5
Junior High School	4
Years of Experience	
0-4	2
5-9	3
10-14	1
15-19	0
20-24	2
25+	1
Highest Level of Education	
Bachelor's degree	6
Master's degree	3
Doctorate degree	0

In addition, 30 elementary school students and 40 junior high school students were asked to participate. A total of 50 students, 22 elementary students, 26 junior students, and 2 students whom did not identify their school, participated by completing the electronic survey. In looking at the student participants, table 2 illustrates that 52% of student participants were from the junior high building while 44% were from the elementary school.

Data Table 2: Which school building do you currently attend?

Students Participants' Building of Attendance	
	Percent
Elementary School	44
Junior High School	52
Undeclared	4

The second section of the student and teacher surveys permitted participants to identify the types of devices they have access to at home and in the school setting. Through a series of "Yes/No" questions, participants were able to list what types of technology they have access to at home and throughout the course of the school day. Comparison of the types of devices that are available to teachers and students has the potential to explain discrepancies in teacher and student perceptions of technology use in school. Data Table 3 shows that teachers all have access to internet access, wireless internet access, and laptop computers at home and in the workplace. The table does identify some differences in the availability of cell phones, tablets, and desktop computers between these two settings.

Data Table 3: Teacher Device Access at Home vs. School

Teacher Device Access		
	Home	**School**
Internet Access	100.00%	100.00%
Wireless Internet Access	100.00%	100.00%
Cell Phone	100.00%	55.56%
Tablet (iPad, Nook, Kindle, etc.)	100.00%	88.89%
Laptop Computer	100.00%	100.00%
Desktop Computer	66.67%	77.78%

Similar to Data Table 3, Data Table 4 shows what devices students have at home and in the classroom setting. Student participants, like the teachers, have almost identical access to internet access, wireless internet access, and laptop computers in both the home and school settings. Student data echoes the teacher data regarding differences in access to cell phones, tablets, and desktop computers across the home and school settings. Within the student participant population there is quite a difference in access to cell phones in a school setting depending on which school building students attend. Students at the junior high reported 76.92% access to cell phones at school while student in the elementary building only reported 40.91% access to cell phone access during the school day. As students among the two buildings have similar access to cell phones at home, this is in school difference is likely due to the fact that the fifth grade, located in the elementary school building, has not yet adopted the BYOD policy that grades 6 through 8 currently have in place in their classrooms. Decreased access to tablets in the classroom setting, compared to the home setting, can also be explained by the fact that tablets are distributed to teachers in our district based on a highly competitive grant system that has only been in place for a few years.

Data Table 4: Student Device Access at Home vs. School

Student Device Access		
	Home	**School**
Internet Access	98.00%	98.00%
Wireless Internet Access	92.00%	90.00%
Cell Phone	76.00%	62.00%
Tablet (iPad, Nook, Kindle, etc.)	84.00%	76.00%
Laptop Computer	92.00%	98.00%
Desktop Computer	52.00%	92.00%

Attitudes towards Technology in School

The third section of the survey, questions 5 through 13, dealt with participants' attitudes towards technology in the school. These 9 items were Likert scale items and **participants** rated their agreement or disagreement with statements regarding technology in school on a scale of 1 to 5. Data Table 5 compares the means and standard deviations of each of these Likert items. As students and teachers within this school district have access to similar devices, it was assumed prior to data collection that there would be no difference in the means of the participant responses for each of the items in this section from the survey. In particular, the means of questions 7, 8, 10, and 11 are quite close. This suggests that student and teacher perceptions are similar concerning the amount of new technology learning completed in the school building, teachers' abilities to instruct better when utilizing technology, teachers' abilities to assist students struggling with technology difficulties, and teachers' knowledge of how to use technology for learning purposes.

Data Table 5: Attitudes towards Technology in School

Attitudes towards Technology in School		
	Students	**Teachers**
Question 5		
N	50	9
Mean	4.30	3.44
S. Deviation	0.89	1.01
Question 6		
N	50	9
Mean	4.18	2.33
S. Deviation	1.04	0.87
Question 7		
N	48	9
Mean	3.85	3.33
S. Deviation	1.13	0.87
Question 8		
N	50	9
Mean	4.00	4.11
S. Deviation	0.88	0.93
Question 9		
N	50	9
Mean	3.02	2.11
S. Deviation	1.13	0.33
Question 10		
N	50	9
Mean	3.92	3.67
S. Deviation	0.83	0.71
Question 11		
N	50	9
Mean	3.72	3.33
S. Deviation	1.01	0.87
Question 12		
N	50	9
Mean	4.12	4.67
S. Deviation	0.63	0.50
Question 13		
N	50	9
Mean	2.56	3.33
Standard Deviation	0.97	0.87

While many of these means are close, it is not the case for all of the Likert items within this section of the survey. Figure 1 helps in identify the questions whose means differ greatly. As shown, questions 5, 6, 9, and 13 vary by more than 0.75. As is clear by looking at Figure 1, student and teacher perceptions vary when concerning the availability of devices for students to use during the school day, students' acquisition of keyboarding skills in school, the amount of total technology learning that has taken place in the school, and who is best able to problem solve and/or fix technology problems.

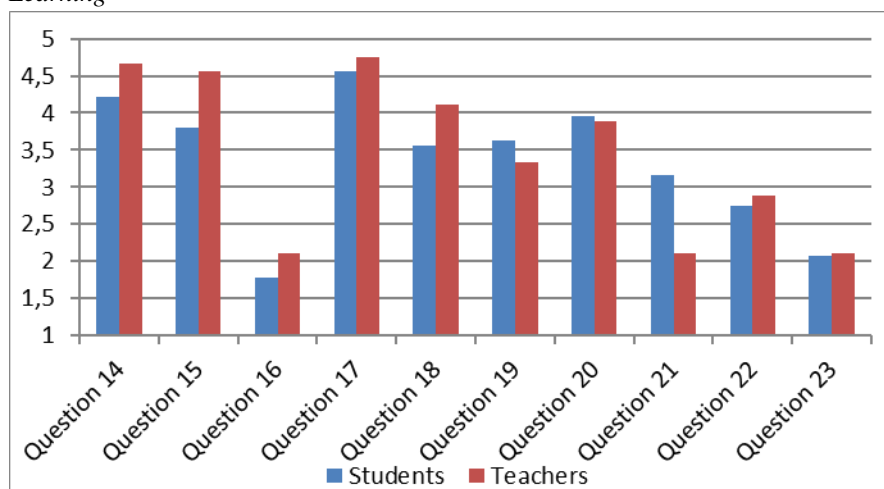*Figure 1: Student & Teacher Attitudes towards Technology in School*
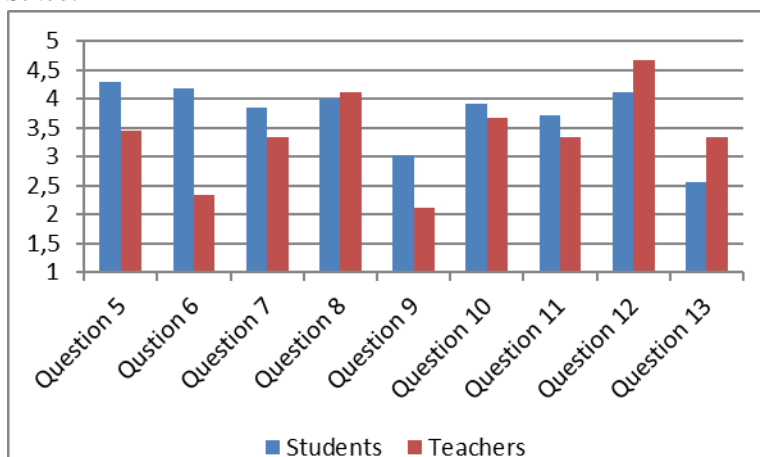
When comparing the data for this particular section of the survey, a paired t-test was run to compare the means of the items. As the t-value was 1.39 and was smaller than the critical value of 2.30 the null hypothesis, that the means were the same, can be rejected. This means that there is a statistically significant difference in the means of the data points from this section of the research survey and that the attitudes of students and teachers regarding technology in school do vary as a whole category.

Attitudes towards Technology and Learning
The fourth section of the survey, similar to section three, was utilized to gauge participant attitudes. In this particular case, the Likert scale items from this portion of the survey were intended to gauge participants' attitudes towards technology and learning. Figure 2 shows the differences between student and teacher means for questions 14 through 23. As can be seen in the figure and verified in Data Table 6, the means of questions 17, 19, 20, 22, and 23 were very similar. This suggests that teacher and student perceptions are similar regarding students' opinions of using their own devices in the classroom, the learning that could be done without the use of technological devices, improvements to student organization due to using technology, how technology complicates or simplifies tasks, and the amount of stress that technology causes students.

Figure 2: Student & Teacher Attitudes towards Technology Teaching and Learning

Data Table 6: Attitudes towards Technology and Learning

Attitudes towards Technology and Learning		
	Students	**Teachers**
Question 14		
N	50	9
Mean	4.22	4.67
S. Deviation	0.86	0.50
Question 15		
N	50	9
Mean	3.80	4.56
S. Deviation	1.03	0.53
Question 16		
N	50	9
Mean	1.78	2.11
S. Deviation	0.91	0.60
Question 17		
N	50	8
Mean	4.56	4.75
S. Deviation	0.79	0.46
Question 18		
N	50	9
Mean	3.56	4.11
S. Deviation	1.07	1.17
Question 19		
N	49	9
Mean	3.63	3.33
S. Deviation	0.95	0.87
Question 20		
N	50	9
Mean	3.96	3.89
S. Deviation	0.78	0.78
Question 21		
N	50	9
Mean	3.16	2.11
S. Deviation	1.08	0.60
Question 22		
N	50	9
Mean	2.74	2.89
S. Deviation	1.05	1.05
Question 23		
N	50	9
Mean	2.08	2.11
S. Deviation	1.12	0.60

There are multiple areas where the differences in the means of the student and teacher data are quite large. In particular, the data regarding questions 15 and 17 suggest differences in student and teacher thinking about how technology impacts learning. Teachers reported a larger relationship between technology use and student motivation than students reported. Additionally, there were discrepancies between student and teacher opinions concerning the statement "Students could learn just as much in class without using technology." Teachers generally disagreed with this statement and overall had an average of 2.11 while students tended to report that they "neither agreed nor disagreed" and averaged 3.16 for this item. Similar to the results of the t-Test of the section 3 data, a paired sample of means resulted in a statistically significant difference in the means of the items for this section of the survey. With a t-value of -0.64 and critical value of 2.26, it can be stated that teacher and student perceptions of the role technology can play in the learning process vary.

Open Response Questions
The final section of the survey comprised of consisted of four open response questions to be answered by the participants. As this section of the survey collected qualitative data, a theme analysis of participant responses was completed. Various key words and concepts were identified for each of the four questions in this section and student and teacher surveys were analyzed separately.

Item 1: What is the biggest benefit to using technology in school? Please explain. In review participant responses about the most significant benefit of utilizing technology in the school setting, multiple student and teacher themes appeared. Displayed in Data Table 7, students claimed technology gives them access to a large amount of information, helps in the organization process, and is fast and easy to use. Similar to students, teachers stated that access to information is one of the largest benefits of using technology in school. In addition, teachers identify technology as a factor in increasing student motivation and declared the availability of instant feedback as useful to students and teachers throughout the learning process.

Data Table 7: Themes from Open Response Item 1.

	Frequency
Students	
Access to Information	10
Organization	9
Fast and Easy to Use	13
Teachers	
Access to Information	5
Student Motivation	3
Instant Feedback	2

Item 2: Can you think of any situations where technology has prevented students from learning? Please explain. In addressing the second open response question, 33 students and 2 teachers stated that they could not identify a situation where technology diminished student learning. Aside from this, both students and teachers listed occasions on which technology was distracting to the student learning process as examples of how technology has prevented student learning. Additionally, both groups of participants stated that device and connectivity issues have also influenced students' learning processes. One teacher stated that the use of technology has prevented students from having other learning experiences. It was suggested that some technology activities, such as researching with the internet instead of reference books, are contributing to the loss of specific learning.

Data Table 7: Themes from Open Response Item 2

	Frequency
Students	
No	33
Technology as a Distraction	8
Device/Connectivity Issues	7
Teachers	
No	2
Technology as a Distraction	1
Device/Connectivity Issues	3
Loss of Other Learning	1

Item 3: What is one thing concerning technology use in the classroom that you wish your school did differently? Please explain. When asked what they wish this particular school district changed about their use of technology in the classroom 17 of the student participants claimed there is nothing that needs to be changed.

Teacher and student participants both suggested that more devices or quicker device repairs and different device access would benefit students. For example, students and teachers suggested that the ability to print from student devices would enhance student learning.   Additionally, multiple teachers suggested that classroom laptops be replaced with Chromebooks as these devices would support the Google platform used by the entire school district. Students suggested that incorporating technology in more ways, like in math, would help student engagement and that there should me more of a focus on addressing how students are inappropriately utilizing their personal technology devices during class time. Finally, teachers suggested that there needs to be an increased focus on the development of students' technology skills, like keyboarding (See table 8).

Data Table 8: Themes from Open Response Item 3

	Frequency
Students	
Nothing	17
More Devices/Repairs	5
Different Device Access	3
Development of Tech. Skills	4
Increased Use in Classes	8
Inappropriate Use in School	8
Teachers	
More Devices/Repairs	2
Different Device Access	3
Development of Tech. Skills	
	2

Item 4: Do you have any thoughts or concerns about the district's use of technology that you want to share?
The final question on the participant surveys was an open response item that gave participants the opportunity to voice any additional thoughts or concerns about the ways technology is being used in classroom setting in grades five through eight. As shown in Data Table 9, the majority of the student participants had no additional thoughts to share. Some of the students who shared additional thoughts restated ideas identified as themes in other open response items. In particular, students stated there is a need for the replacement and repair of current district devices and that there are students who misuse the privilege to utilize technological devices in the classroom setting. Teachers, like the students, either chose not to add any additional thoughts or suggested that technology in the district could be improved through the replacement or repair of the current devices. A number of participants from both the student and teacher populations wanted to share their appreciation of the district's technology emphasis, especially for students in grades five through eight.

Data Table 9: Themes from Open Response Item 4

	Frequency
Students	
No	33
Replacement/Repair	2
Appreciate Tech. Efforts	5
Misuse of Tech. at School	5
Teachers	
No	2
Replacement/Repair	2
Appreciate Tech. Efforts	2

Discussion
The research findings of teacher and student perceptions of educational technology are quite comparable with the literature reviewed prior to the implementation of the survey. Data concerning device availability, teacher perceptions of technology, and student perceptions of technology correspond with many of the findings previously outlined in this report. Additionally, the overall lack of differences in student and teacher perceptions found in this study is unexpected.

Device Availability
In discussing perceptions of educational technology, identifying limitations and areas of concern regarding access to devices, particularly in the school setting, has the potential to explain any disparities among student and teacher populations. In the case of this particular study, BYOD surely plays a role in students' thinking about technology use in the classroom. Although 38% of students reporting that their preference is to utilize a school issued device during the school day, the majority of the student population claimed that using devices permitted by the district's BYOD policy is preferable. This aligns with the research of Swan, Van't, Hooft, Kratcoski, and Unger (2005) and suggests that students' prior knowledge of their personal devices' functionality helps them to focus on their educational tasks.

Via data analysis, it was also discovered that both the participant groups have access to similar devices across settings regardless of their status as student or teacher. To illustrate, both students and teachers reported more access to desktop computers at school than at home and this is likely explained by the placement of multiple desktop computers in each elementary classrooms and access to computer labs with desktop computers in the junior high setting. Because teachers and students have similar access to devices in the school and home settings, differences in student and teacher perceptions of educational technology are not likely related to the populations' access to various devices.

Teachers Perceptions of Technology
The overall success with the implementation of educational technology and the lack of participating teachers' discomfort is likely aided by their willingness to pursue professional development opportunities dealing with technology. Corresponding with Howard's (2011) findings dealing with the relationship between technology implementation and professional development opportunities, access to training has impacting teachers' perceptions of technology use in the classroom. Additionally, Thornburg's (2014) research supports the district's initiatives to provide learning opportunities for employees as a means of ensuring that investing in devices makes a significant, positive impact on teachers' ability to provide instruction and students' ability to learn.

The enthusiasm of participants about technology is likely due to the fact that they widely agree, with a mean of 4.67, that the whole district thinks using technology for learning is important. This positive environment, as described by Howard (2011), is presumably the reason that participating teachers were supportive of increased technology implementation throughout the district and have positive perceptions of technology use in general. In identifying barriers to such a change, teachers did point out that students primarily use technology for research and to utilize word processing tools to produce electronic documents, but, like many districts embracing the use of technological tools for educational purposes, have previously lacked a rigorous, formal keyboarding curriculum for students.

As teachers' positive perceptions of educational technology were supported by prior research, so are teacher concerns. Dunleavy, Dexter, and Heinecke's (2007) research suggests that logistics, hardware problems, and device malfunctions are an area of concern for teachers. In this particular study participating teachers remained neutral about their abilities to solve technological problems and did identify broken devices as hindrances to their capabilities to effectively make use of technology in the classroom setting. Due to the varying functionality of devices associated with the BYOD setting, it's probable such a setting negatively impacted teacher perceptions of their ability to problem solve technological issues in their classrooms. Furthermore, teacher requests to incorporate larger quantities of specific devices, in this case Chomebooks, suggest their discomfort and/or frustration with school issued and student devices that do not fully support the Google platform, which is utilized by students in grades five through eight in the participating school district on a daily basis.

Student Perceptions of Technology
The student perceptions, similar to teacher perceptions, identified through this research also parallel previously reviewed studies. Reflective of Gorhan, Oncu, and Senturk's (2014) findings, student participants reported low

levels of stress related to technology use and asserted that using technology in an educational setting is enjoyable. In fact, students communicated interest in increased technology use throughout the core content areas. Additionally, students indicated that technology use in school is assisting with more than just their assignment completion. Organization and time management were two areas students identified as being positively affected because of the use of technology in the classroom setting.

Despite the many ways in which technology is aiding students in their learning, it was reported that technology is a distraction for some students. In particular students reported in appropriate use of devices during the school day. This suggests, as does Bruder's (2014) research, that there is a need to readdress the ways in which the school district enforces rules for technology use in the BYOD setting.

Differences in Teacher and Student Perceptions
In was anticipated that discrepancies in student and teacher perceptions of educational technology would be identified through this research. While there are some minor differences in the ways that these participant groups view both technology in the participating district and technology for learning, the data indicates that students and teachers think very similarly regarding the use of educational technology in grades five through eight.

Recommendations
Because only minor differences in student and teacher perceptions of technology use in grades five through eight were identified via this research, it is suggested that no immediate modifications be made in regards to the use of educational technology within grades five through eight. The findings detailed above as well as the literature reviewed support the district's adoption of a BYOD policy in lieu of transitioning to a one-to-one device to student environment.

Additionally, strong student perceptions were identified regarding teachers' knowledge of utilizing technology for learning and their abilities to solve technological problems as they arise. Teachers' perceptions of these concepts, while not as positive as students, suggest that they are currently receiving the appropriate professional development through the district and elsewhere to meaningfully facilitate learning with the aid of technological devices in the classroom setting.

In order to maintain these beliefs as technology evolves, it recommended that the district continue to focus resources on educational technology use in grades five through eight. Frequent offering of technology related professional development opportunities and maintenance and/or replacement of outdated devices of on a regular basis will undoubtedly aid in the retention of positive teacher and student perceptions of the districts practices regarding educational technology.

Conclusion
As technology continues to evolve, so will its place in the field of education. While the results of this study are only pertinent to this school district, it is necessary for all school districts and individual educators to continuously evaluate teacher and student perceptions of their educational technology use. Regular assessment of perceptions regarding technology use in the classroom setting has the potential to drive educational decision making in a manner that best addresses the needs of students and teachers. Furthermore, such a practice would allow school districts to routinely reflect on whether or not their technology policies and practices reflect technology advancement and provides opportunities for educators to verify that students are equipped with the necessary technological skills to successfully contribute to our technology-rich society

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