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Mobile learning has changed the way in which learners learn and has afforded the ability for learners to learn anywhere and at anytime anytime, anywhere learning. Learning no longer is about the possession of information, but places emphasis on the learner’s ability to integrate and analyze information. The great advantage of mobile learning comes from being able to learn without being restricted to time and space, and this is highlighted in the Technology Acceptance Model, extended from the Theory of Reasoned Action, where it highlights the usefulness and the ease of use that mobile learning has afforded modern society (Wen-Chun & Yeng-Hong, 2016, p. 1667). Usefulness can be interpreted in many ways, but I understand it in my context of teaching high school students to be able to get them college and career ready to handle the demands of the world. Most college and career bound students will be using the mobile learning format in their everyday lives. While there are numerous benefits to mobile learning, it does come with its dilemmas. Again, putting this in the context of my framework, I see firsthand the ethical dilemma posed by mobile learning. Mobile learning is not afforded to all learners and it is not afforded to all learners in the same capacity, which begs me to question whether mobile learning creates a bigger gap of education inequality. Literacy rates in underprivileged areas are significantly lower because of reasons such as the lack of means or accessibility. This is no different for mobile learning. It is important to be mindful that “Socioeconomic status impacts significantly on whether a student has access to a home computer and internet connection” (Crawford & McKenzie, 2011, p.536), thus threatening the notion of anytime, anywhere learning that mobile learning has the potential to afford. This is not to say that there is no place for mobile learning opportunities in underprivileged areas. This just means that teachers need to be mindful of their learners and their environments and design something that supports them in their lives. In an effort to seek this information, a survey was created

Determining BYOD Capacity

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### Abstract

With technological advancements everything we could possibly need is literally at our fingertips; however, not everything is fair for us to access. This paper discusses the ethical and legal considerations facing instructional designers. It is absolutely vital that instructional designers abide by fair use policies and when utilizing technology to deliver instruction. This paper summarizes the fair use policy that instructional designers must practice.

### Determining BYOD Capacity

Technology has impacted not only education, but it has impacted almost every facet of our lives. Technology has not just become a trend in education. It has become a resource and a tool of education for both teachers and students. While digital technology has expanded throughout the modern world and it affords us numerous advantages that were previously untapped, it does come with constraints that need to be considered. Technology use in education has afforded learners to collaborate in ways that have never been possible before. It has allowed learners to have information at their fingertips as they gather information from multiple sources. Technology has brought forth the opportunity for learners to learn remotely whenever and wherever they may be. It has also provided resources to educators in being able to provide the best lessons to their students.

Technology is very much a presence in my life both professionally and personally. I grew up in a time when technology was changing and forcing its way into the education front. My college years required me to learn how to turn in assignments online and to collaborate with students online. Technology did not have a big presence, but it was something I felt that was slowly integrated into my college education. By the end of my college career, technology was used for everything. Instead of visiting a professor during office hours, emails became the primary form of communication. Instead of scheduling meeting times with partners or groups, we worked at our own individual paces on a shared document where we collaborated at our own conveniences. Since then, technology has definitely infiltrated my life and everything is now operated using technology - calendars are synced between computers and phones, assignments are graded online, messages and letters are written online, and I am constantly on my laptop,

phone, ipad or tablet. My classes are all conveniently online and I can work at my own place at my own optimal times. To say that technology exists in my life is an understatement. To say that technology operates my life or helps me exist in my life is more accurate.

Having taught in this district for a number of years, I see how unfamiliar my students are with using technology in education. They use technology in their personal lives, but they have little to no experience using it in the framework of education. Since obtaining a Master of Arts in Education Technology, my goal has been in meeting my students where they are currently and to get them College and Career Ready in the area of technology use to both deepen and widen their education journey.

#### Digital Technology Use in Education

The integration of technology has not proved to be a seamless transition at Cedar Springs Public Schools, a rural school district in West Michigan, which is true of most schools in similar demographics. The International Society for Technology in Education (ISTE) define technology integration as the assimilation of technology resources and technology enabled practices as a routine and seamless element of the day, so that students are prepared to use technology for the workforce (NCES, 2002). While there has been an overall move towards the adoption and implementation of technology in education across the United States, there are districts like Cedar Springs who are falling behind due to the lack of resources available by the government and the community does not have the means to provide such access. In an effort to determine the Bring Your Own (BYOD) capacity of the school, a survey was conducted for administrators and technology professionals and another survey was conducted for students to determine student accessibility off campus. For the purpose of gathering accurate data for the high school, the

information gathered is in inventory that pertains to the high school building. For the purpose of gathering accurate data to help guide my students better, the information gathered reflects the survey conducted with 130 of my own students. The results of the survey will be broken down into the following five categories: devices, operating systems, software, security, and storage.

#### Category 1: Survey on Devices

In surveying the number of devices in the high school building, it was found that there are 400 devices at the high school. The breakdown of the 400 devices available are listed on Table 1 below. These devices range from Dell desktop computers, laptop carts of various laptops as well as the new addition of Chromebook carts purchased this year.

Description	# Available
Computer Lab 1 - Journalism	35
Computer Lab 2 - D2 Wing	40
Computer Class 1 - E2 Wing	35
Computer Class 2 - D1 Wing	40
Early Middle College Cart	30
Independent Study/Online Course Lab	30
Special Education Lab	20
Special Education Cart	35
Academy Cart	60
Media Center	75

Of the 400 devices available to students, the majority of these labs are only available to students when teachers sign out the labs for class use, which does not happen often due to the limited number of labs available and the regulations for teachers in terms of checking out labs. Teachers

must sign out labs two weeks prior to the date needed and cannot sign out more than two consecutive dates. These regulations deter teachers to utilize technology in their classrooms.

Computer Class 1 and Computer Class, which houses 75 of the 400 (18.75%) devices, are only available to students when they are that teacher's classroom. These are teacher classrooms and are not accessible to students outside of their scheduled course time. The Computer Lab 1 is technically called the "Journalism Lab" and are booked three hours of the day with journalism courses and therefore the 35 of the 400 (8.75%) devices are only available three hours (50%) of the day. The 60 of the 400 (15%) devices are committed to the Early Middle College Cart and the Independent Study/Online Course Lab all day and are unavailable to students whose schedules do not show they are enrolled in either Early Middle College, Independent Study, or Online Courses. This is the same for 60 of the 400 (15%) devices committed to the Academy and the 35 of the 400 (8.75%) devices in the Special Education cart. The 20 of the 400 (5%) devices in the Special Education Lab are utilized by the students in the Cognitive Impaired program in the district. Of the 400 available devices, only 115 (28.75%) of devices are available to general education students in the building with no special courses.

The number of devices available to the majority of students throughout the day is not enough to regularly use technology in the curriculum. In an effort to assess whether implementing a BYOD program is practical for my community of learners, I conduct a technology survey of students to see whether I can implement some technology integration in my class and curriculum. Table 2 shows the results of the 130 students in my English 10 course and their availability to devices at home. Having given this survey for years, the noticeable trend has shown the increasing number of students who have access to devices in their personal lives.

However, while more and more students have access to Smart Phones, the data in Table 3 shows the access students have to the internet has not changed. In fact the number of students with unreliable access to the internet has been on an upward swing.

Table 3

*Internet Access at Home*

Description	# Available	%
WiFi Access	119	91.54%
Broadband Access	14	10.77%
Dial Up Access	7	5.38%
Unreliable Access	62	47.69%
No Internet Access	12	9.23%
Not sure, but I have access	27	20.77%

Table 2

*Devices Available to Students at Home*

Description	# Available	%
Desktop Computer	22	16.92%
Laptop Computer	47	36.15%
Chromebook	16	12.31%
iPad	28	21.54%
Android Tablet	14	10.77%
Smart Phone	117	90.00%
None	14	10.77%
Other	60	3.08%

## Category 2: Operating Systems

All desktops and laptops available in the high school building operate on the Windows Operating System and all the Chromebooks operate on the Chrome OS. While teachers have



been asking for ipads and other Apple products, which would utilize the iOS, this has not happened as of yet in the high school building. Table 4 shows the survey results of what operating systems students run outside of school. Due to the fact that the majority of students have Apple iphones, the majority of students (63.85%) run iOS. Some students are unsure about what operating system they run.

Description	# Available	%
Android	37	28.46%
iOS	83	63.85%
Other	8	6.15%
I do not know	24	18.46%
None	18	13.85%

### Category 3: Software

The software most utilized by teachers are PowerSchool and Microsoft Word. Teachers are still using Microsoft Words far more than Google Docs and have struggled to transition to using cloud based storage and technology. The preference among teachers is to use Microsoft Office software over Google software. Teachers prefer to use Microsoft Word more than Google Docs, Microsoft PowerPoint over Google Presentation, and Microsoft Excel over Google Spreadsheet. This data shows that most of the teachers are using the technology that they have been using and are staying within their comfort zone. The teachers have used Microsoft software in their schooling and are more familiar with the way in which to use this type of software, that they are continuing to use a product that they know and have operated. The end of the year

technology survey given to teachers at the end of the school year shows that teachers are slowly making the switch from Microsoft software to Google software.

The same end of the year technology survey shows the alarming rate of internet browsers used by teachers. The data from this survey shows that approximately half of the teachers are still using Internet Explorer as their web browser option. When asked why they use their preferred browser in a follow up survey, the majority responded that it was what they knew and an option available to them. When investigating this further, the technology team found that the default browser set on the majority of the devices, including the teacher computer stations, was Internet Explorer. Since this realization, the technology team created an informative handout to push for the use of Google Chrome or Mozilla Firefox. It was also determined that the majority of the technology tickets written by teachers in regards to PowerSchool, the Student Information System (SIS) utilized by the district and the most widely used software in the district, was due to the fact that PowerSchool was not compatible to Internet Explorer.

In 2014, the District Technology Team was created as a grassroots movement to try and promote education technology in the district. Four individuals (teachers, instructional coaches, and a special education instructor) came together with the goal of advancing the district's use of technology in teaching and learning. This group has surveyed the teachers and used the information to help plan a yearly Professional Development centered around technology use in education for teachers and students. This group would also host a number of Professional Development opportunities after school in teaching about different software ranging from classroom management to collaboration to communication and even to Learning Management Systems. The purpose of this group was to fill the technology toolbox of the teachers and help

them find ways to experiment with technology in their teaching. The goal for the 2015-2016 school year was for every teacher to take an existing project or assignment and to integrate a technological component and to observe what the use of technology did for the learners. Some educators asked students to create a presentation using a presentation software while others asked students to document their project using web-hosting software such as Weebly or Wix and comment on the work of their peers. The software utilized by the teachers in the building are changing based on not only the needs of the students, but also the education and familiarity of the resources available to the teachers.

#### Category 4: Security

There is limited information available in regards to the district and building's security features. Due to the fact that the Survey for Administrators and Technology Specialists was presented during the month of July when everyone is on vacation, little to no specific information was gathered. The district made the move to outsource their technology needs in 2013 and there is no one currently in the district who has a clear understanding of the specific technology details. The survey response by administrators demonstrates that the principals of the building have no knowledge or understanding about the security systems and protocols that they referred directly to the technology specialists. I was unable to reach the two main technology specialists for the district because they were also on vacation, leaving no one to be able to answer the questions about the building security. I finally got a hold of the director of the company, who tried to help, but could only tell me that the current security measures "follows Fed and State requirements". When asked to explain what the Federal and State requirements were, he could not answer.

The search for answers regarding security led me to ask teachers about whether they had any issues in regards to security features using technology and there were some issues and concerns shared. There were a number of cases, seven from the responses received, where students were utilizing technology in an inappropriate way that should not have been made possible or where Hapara, a security system that was previous in use, was no longer possible. These concerns demonstrate that teachers and administrators know little to nothing about the Federal and State technology guidelines that exists. What we do know is that there are a number of sites such as YouTube, Facebook, Twitter, Instagram, Pandora, Glogster, Vimeo, and television network sites to name a couple that are restricted, but we also know that students are able to find creative solutions to access these sites.

The technology security issue has also become an area of concern since 2014 when the no cell phone policy was lifted and students were permitted to bring their devices to class. Even though students are only allowed to use their devices for educational purposes and with the permission of their teachers, allowing cell phones in the classrooms has added to student behavioral issues with students spreading rumors, instigating student fights, students taking photos of teachers and other adults, and even threats, bullying, and sexting. Security is of utmost importance and this is an area that the district and building need to have a better understanding of in order to move forward towards adopting and implementing a BYOD policy.

#### Category 5: Storage

The information on the amount of storage available on the devices in the building was also an area that there was little to no information about and referred to the technology specialists who are on vacation. The school has Google Apps for Education, which gives each user

unlimited storage for Google Drive, Gmail, and Google Photos. Prior to Google Apps for Education, the school gave each student access to their own hard drive storage, which is still available to students. Teachers and departments are also given hard drive storage space on a shared drive and that has been at maximum capacity for the last three years. Instead of transferring documents into the unlimited storage given through Google Apps for Education, many of the teachers are concerned that there will be technology glitches that will delete their files if they transfer it into Google Drive. Some of the younger and more technology savvy teachers have started to organize and save their files on Google Drive and deleted everything on the shared drive to free up storage space for those who still have not moved to utilize the storage capacity provided through Google.

I work with teachers from both camps and have promoted the use of Google to store and share files, but have met resistance by teachers who are used to the way things were done prior to the adoption of Google Apps for Education. However, the storage and access capability of Google Docs and Google as a whole has made things like typing papers so much easier for my students. No longer do they need to remember their flash drives between school and home, no longer can they use storage and document saving as an excuse, and no longer are they required to print off their papers for submission.

While I was unable to get the information about the amount of storage space available on the devices in the building, I do find comfort that most all the software and technology utilized does not require storage space. Using technology in education has become easier in the sense that much is offered online through websites rather than downloadable software that requires storage space.

### Conclusion

From the findings of the survey and from the information I know from sitting on the District Technology Team, it is my conclusion that the high school building at Cedar Springs Public Schools is not ready to implement a BYOD environment. The main reason for not being ready to implement a BYOD environment is the lack of devices available to students. The majority of the students only have their Smart Phones to rely on and the use of phones in the classroom, even for education purposes, have created other issues in terms of student discipline and security.

The main concern I have about adopting and implementing a BYOD environment at the high school is in regards to security. BYOD has an inherent security risk as “[w]hen students are allowed to take devices home or bring their own devices from home, there’s an increased chance of malware infection. Therefore, maintaining security in a BYOD environment becomes more challenging” (“Deploying BYOD...”, 2013, p. 1). Supporting BYOD requires more attention and involvement in technology than the building and district currently have. While I understand the need to outsource technology, I believe that implementing a BYOD policy would require us to have a knowledgeable someone in house who is available and accessible. The technology specialists who are the points of contact for the district are also responsible for four other districts and therefore is unable to respond to matters quickly. There is currently no one in house, even among the administrators, who have a sound knowledge and understanding of anything regarding information technology (IT). Not having anyone available who has some semblance of understanding about IT should be resolved prior to deploying BYOD. “Supporting BYOD goes beyond traditional management and security measures undertaken by an IT department. For one

thing, staff training on the different devices is key to success” and we currently don’t have any training on the different devices or how to utilize all that we currently do have access to (“Deploying BYOD...”, 2013, p. 2).

While I do believe that the current state of the resources we have available does not make us BYOD capable as of yet, I do strongly believe that it would be more than beneficial for us to align our technology goals with the idea of getting us to be BYOD ready by a certain year. When I think about about what makes students College and Career Ready, their technology literacy is a big component of that. In order to help prepare these teenagers to compete and keep up with their national peers, they need to have the exposure and the experience using technology. These teenagers may have grown up in a technology empire, but they have never been truly taught how to use technology. Many of our educators have never been truly taught how to use these technologies either. In her article titled, “On the Horizon: Trends, challenges, and education technologies in higher education” Diane Skiba speaks to the challenges of instilling a BYOD culture and that prior to adopting such programs, there must be “faculty buy-in to make [it] successful” (Skiba, 2016, p.183). In addition to training educators, there needs to be a training of students in terms of the appropriate use of technology in terms of etiquette and security. These are all things that could be taught and implemented as part of a course as we work towards being able to implement a BYOD culture.

Without a clear vision and purpose, no program will ever be successful. We can’t just jump into the BYOD trend. We must comb through all the various facets involved in making this decision as we would any other decision. If such a program were to be implemented, we need to design backwards with great intentionality. Not only do we need devices, but we need education,

training, policy, consider the network to ensure sufficient bandwidth, we need to consider storage and troubleshooting, along with a plan to keep up with not only purchasing new devices, but also maintaining these devices. I believe the first step in getting this building and district to a place where we can really discuss the possibility of BYOD is to start with a team where everything is disclosed, where there is transparency, and where there are checks and balances. In order for any plan or system to be implemented, there needs to be a strong foundational team that the people trust to guide them.



## References

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Appendix A: Survey for Administrators and Technology Specialists ([goo.gl/forms/d2rhHaNnjsv3oty32](https://goo.gl/forms/d2rhHaNnjsv3oty32))

The Survey for Administrators and Technology Specialists only resulted in three responses - two from the building administrators and one from the director at the company the district outsources technology to who did not have the specific information in regards to the district. The survey can be accessed by clicking the hyperlink above. Much of the survey was written as a means of gathering data for the purpose of this report as well as to education myself on the different IT specific information that I, too, had little to knowledge about.

The survey was unsuccessful in that there was no one who was able to provide a comprehensive answer to the questions asked. There are only two individuals who are able to answer these questions and the two individuals were on vacation and are instructed to not provide information unless it was approved by an individual at the district, demonstrating that there is little to no trust and transparency in the district. Being that it is summer and that July is the month that all administrators are on vacation, it was difficult to get a hold of the individuals who would permit me to gain access to such information. The process of trying to gather information for the purpose of this project demonstrated that not only are we not ready to act on implementing a BYOD policy, but we have bigger issues that we as a district need to address.

Appendix B: Student Technology Survey ([goo.gl/forms/4wCPsJCWRnIFtGjp1](https://goo.gl/forms/4wCPsJCWRnIFtGjp1))

The Student Technology Survey is given to students in the first week of the semester. This survey has been given to students every term since 2013 to better understand what learners have access to outside of school in order to guide the teaching practices implemented in the course. The survey also provides a place for me to understand how students have been utilizing technology. The survey also asks students to create technology oriented goals for both their personal and professional lives.

The data collected has shown that while student access to Smart Phones have increased through the years, student accessibility to reliable internet and use of technology in education has maintained the same. Students also take a survey at the end of term to discuss how they felt about their initial technology goals. The ultimate goal is to see an improvement and to provide them with the necessary tools to continue to access technology in their education.