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**Technology and Student Centered Learning: Using Digital Tools to Instruct Student
Centered Learning While Meeting the Needs of All Students**

By

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A capstone submitted in partial fulfillment of the requirements for the degree of Masters of Arts
in Teaching.

Hamline University

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ABSTRACT

Geinnotta, H. Technology and Student Centered Learning: Using Digital Tools to Instruct Student Centered Learning While Meeting the Needs of All Students (2022)

Every year, technology is further developing and the way that technology is being used in our classroom's changes. As we have seen through the Coronavirus pandemic, technology has become a vital part of education. Technology can be used in many ways through many different digital applications and this capstone project leads to answer the question, *How can secondary teachers best utilize technology to enhance student centered learning and meet the needs of all students?* As technology continues to develop, research is being conducted to determine its effectiveness as an educational tool, the impacts of technology on student learning and engagement, and what the best ways to incorporate technology in the classroom are through different instructional strategies. This project was developed to provide teachers with the knowledge and tools necessary to be able to select digital tools that serve an intentional purpose to support student centered learning. The series gives educators opportunities to explore different digital tools, discuss, and reflect on ways in which they can use these tools in their classrooms to support student learning.

This project is dedicated to my family.

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CHAPTER ONE

Introduction

Technology Through the Years

Throughout my time as a school aged student to a grad student, I have had the opportunity to watch technology evolve. As this chapter will discuss, technology is constantly changing. This constant change and growth of technology and its use in the classroom has led me to my research question: *How can secondary teachers best utilize technology to enhance student centered learning and meet the needs of all students?* Technology for the purpose of this capstone is being defined as the equipment and digital applications used for everyday use within the classrooms and our free time. My research question will be paired with my capstone project of creating a staff professional development that will provide educators with a deeper understanding of student centered learning and discussions and demonstrations of different digital tools that educators can use to enhance student learning.

Growing up, teachers would have to wheel in an overhead projector, plug it into the wall, adjust the lights and the mirror to ensure that the image was centered on the pulldown screen. They would then have to get their special transparency film sheets, sometimes clean them of their smudge marks or of the previous lesson's work and get their special transparency markers. All of this work for the teacher to project a lesson for the students to follow along with. If a teacher needed to use a television, they would grab a communal tv that was strapped to a rolling cart and use their VHS tape to display the program for that day's lesson or to play a fun Bill Nye The Science Guy video. When we got home from school, we had the option to play a few computer games like Rabbit Reader, Oregon Trail, or Clue Finders. Not only were these games

educational but they were also fun, as long as your desktop computer would load fast enough. Now, if you had to use the internet for something, you had to go through the process of connecting to the internet through your dial up connection.

Chapter Overview

Chapter One discusses the journey, both personal and professional, that led me to my research topic and question. This chapter looks at how I developed interest in researching the effectiveness of technology use in the secondary classroom. The chapter covers my history with technology use for personal and educational reasons. The purpose of this chapter is to show the relevancy of this topic to the field of education.

Middle School Years

As I progressed through middle school, technology was advancing. Teachers were now using projectors that were mounted to the ceilings and they no longer needed to wheel the projector into the room. Computer labs were popping up in our schools with chunky desktop computers that taught students how to navigate through a computer and how to type, making sure you are using your *home row* and not *hunting and pecking*. It was middle school, when I had my first email address and got AOL instant messenger to message my friends from home. During middle school, many students were receiving their first cell phones but it was not until the end of eighth grade that I received my very first, all black flip phone.

High School Years

High school was a different story. Technology was booming and was being used everywhere and for everything. Teachers were now using smart boards that were hooked up to the internet and that you could use special markers on to teach a lesson in front of the class. The internet was quicker and could be used from laptops, cell phones, and ipads. Everything you

needed was at your fingertips with the use of these portable devices, faster internet, and wifi. I was applying to colleges online, filling out applications for jobs online, and buying my first laptop to prepare me for college.

Career

Now throughout my educational career to become a teacher and through being a substitute teacher, I have had the opportunity to observe many different K-12 classrooms in different districts and different schools, to see how technology has advanced and how schools navigate teaching with technology. As mentioned, in middle and high school I had access to desktop computers with internet access, cell phones, or laptops but the way technology has advanced and evolved over the years, the classrooms of today look a lot different. Students now have one on one technology, such as Chromebooks or Ipads, to use for homework and their classrooms for daily lessons. Teachers can use different apps to interact, engage, and grade student's work. It is clear that technology is not going away and that it can be a great tool to use in the classroom. However, I wonder if teachers have been taught how to successfully integrate technology into their classrooms to benefit student learning and if students have been taught how to use technology to benefit their learning.

Through my education and my professional experience, I have had the opportunity to speak with many different teachers about how they use technology in their classrooms and their opinions of technology use. Using technology as a learning tool can be controversial with the added challenges of a student's developing brain. I experienced the arguments on whether the amount of screen time is appropriate. However, another concern a teacher faces is the impact technology has on learner outcomes. My question explores both of these aspects of technology as

a learning tool. *How can secondary teachers best utilize technology to enhance student centered learning and meet the needs of all students?*

My Journey

I originally went to college and received a bachelor's degree in business administration with a concentration in management. I did most of my education for this degree online as I was traveling and working as a nanny in a different state. My education was completely reliant on technology. I can tell you that I have not used this degree at all. As soon as I received my four year degree, I was able to become a substitute teacher. I have always had a passion for working with young people and have had jobs in daycares, as a nanny, and in schools that have allowed me to follow this passion. By having my four year degree and being able to become a substitute teacher, I completely fell in love with teaching and the classroom. After about a year as a substitute teacher, I decided it was time for me to go back to school and eventually landed on Hamline University's masters in teaching program that would allow me to gain my initial teaching license and get my masters degree. During this program, I learned many different teaching techniques, classroom management strategies, and all about student centered learning. Student centered learning is the idea that the teacher is the facilitator and that students are in control of their own learning (Wong, 2021). I thought this was so interesting because this was not the way that I had been taught and it was not the way that I was seeing some educators teach. Through this program and substitute teaching I was able to tour different schools and learn about the different ways that each school functioned and the different ways that teachers were teaching. This really sparked my interest in the different ways that each school incorporated technology into their lessons and the different methods teachers were using to deliver their content.

As a student who received their BS degree online, when COVID-19 hit, I was so intrigued how teachers were going to use technology to deliver an all online school day to secondary aged students. I wondered if teachers would run their online course like a college course and if by doing that it would give students more freedom. I was curious to see if the students would actually learn through their online experiences or if Google would be used to complete their homework, tests, or quizzes. I also wanted to know how the teachers were going to construct their lessons to be student centered and how the teachers were going to keep the students engaged with each other and their work.

Distance Learning During COVID-19

There were so many questions that I had during this time but as a substitute teacher, I was out of a job and did not have access to the classroom to see how things were being run. However, I was fortunate enough to get a job working with a group of fifth and sixth grade students in person while they were distance learning at the beginning of the 2020-2021 school year. This gave me the opportunity to see how different teachers were navigating their way around distance learning and the constant use of technology. Through this experience, I witnessed how students would copy and paste questions and answers, watch videos of lessons instead of interacting with their teachers, skip their virtual lessons with their teachers, or they would completely ignore their work. The students seemed as if they were more interested in playing games on their computers, texting their friends, or sleeping than they were in learning.

Learning After COVID-19

After schools went back to in-person learning, I was fortunate enough to be able to student teach at a high school. I had not had much exposure to this age group and I was excited to see how things were done at this level. The school that I taught at had a new administration

team and a new superintendent to the district that encouraged teachers to only use their Learning Management System (LMS) to give assignments and tests. The team of teachers that I was working with had a variety of ages and career lengths. The teachers with longer teaching careers preferred paper over technology and the newer teachers had pros and cons about both. It was really during this time of student teaching that I began questioning the effectiveness of technology use in the classroom.

In this class we always gave the students work time so that they did not have to take any work home. During work time, I watched as students would Google their answers, they would watch Youtube instead of completing assignments, or they would sit on their phones instead of completing their work. The school that I was at used Chromebooks and this meant that there was no way to monitor/control/lock a student's screen without being right next to the student. This school did not have access to programs like GoGuardian. GoGuardian is a classroom management system that allows educators to monitor district given devices on the schools network. The program would allow educators to lock student screens and can give reports on student usage. However, if the students are using a personal device such as an iPhone, iPad, or personal laptop this system does not work. Without a program like this in place, it was impossible to monitor all of the student's screens. No amount of walking around the classroom was going to effectively monitor all 35 student's screens. While knowing this was going to be a challenge, we had classroom expectations that were discussed with the students frequently about how they should be using their work time or about how they should use technology. But the expectations were not working and the turn in rate for assignments reflected that.

Since this particular high school was requiring that teachers use Canvas (LMS), which was new to them that year, to distribute all assignments and assessments, they did provide

school wide training on how to use it. I was able to observe that the younger teachers were able to pick up on how to use Canvas fairly quickly and that some of the older teachers were really struggling. The amount of comfortability on using Canvas between teachers was reflected through specific teacher's Canvas classroom pages. Not only was Canvas new for the teachers but it was also new to the students. The school left it up to the teachers to explain to their students how their class page was going to be set up and how it was going to be used. While student teaching at this school, I experienced many different ways that technology was posing as a challenge and how it was not being used to benefit student learning.

There may be many disadvantages with technology that I experienced while student teaching but I have also seen the advantages. Using technology to assign assignments or give our quizzes/tests makes it easier to grade student work. Depending on the assignment, the application that you are using can grade things for you. Technology also makes it easier to provide feedback for your students that gets directly sent to their devices. Technology also makes it easier to prep materials for lessons by cutting back on the time spent printing and stapling paper together and the materials are available right at the students fingertips. It can also be beneficial for students that have IEPs or ELL students because technology allows students to type rather than write, students can easily translate words, screen readers, text to speech, and can provide quick visuals for students. While there are many different disadvantages and advantages to using technology in the classroom, it was my experience and observations during student teaching that put me on this course of research. The lack of knowledge around how to use technology properly, lack of provided digital tools, and student engagement levels led me to researching technology use for my capstone project.

Rationale

Technology is always evolving and has a huge impact on the lives that we are all living in today. People spend their days on their computers and then go home and watch tv, scroll through social media, or play video games. Technology is constantly being used in some form or another to help us get through our day. Schools are implementing one on one technology for all of their students in hopes of enhancing learning and giving access. Computers and technology in the classroom used to be rare but now one on one technology is allowing students to take control of their education. Furthermore, after COVID-19, students and families now have the opportunity to choose if they would like their child to attend school in person or through an online school. In either option, students will be using technology to benefit their education throughout their entire school day. While watching as veteran and first-year teachers discussed the use of technology in their classrooms and the different opinions that these teachers had about the amount of technology used in their classrooms that led me to question many things. I questioned if other teachers were contemplating these same concerns about technology. I also wondered if teachers were being trained how to properly use technology and if that training or lack thereof was influencing their opinions about technology and how they used it in the classroom. I wondered if the technology being used in classrooms was benefiting student learning and if it was being used as a tool to help meet the needs of students. Our classrooms are filled with a variety of students. Students with IEPs, 504 plans, disabilities, different cultures, backgrounds, home lives, different reading levels, languages, and a variety of socioeconomic status etc. I wanted to know how educators were using technology to meet all of the needs being presented by their students.

It is our job as educators to help students think critically, inquire, and to develop student centered lessons that encourage all students to use these skills. Teachers are told to use technology as a tool in their classrooms to assist with student centered learning and to help meet

the individual needs of their students. However, I am not sure educators know how to do this. There are over 80,000 applications that educators can use that could be classified as educational tools (Hirsh-Pasek et al., 2020). Educators need to be taught how to use and analyze these different digital tools and applications in their classrooms to determine the ways in which they benefit student learning, enhance student centered lessons, and meet the needs of all students. For the use of technology to be effective and beneficial, teachers need to feel confident about what they are using and why (Milbrath & Kinzie, 2000). It was these thoughts and wonderings that led me to my research question: *How can secondary teachers best utilize technology to enhance student centered learning and meet the needs of all students?*

Conclusion

In Chapter One, I explained my journey as a child while growing up with technology rapidly evolving around me and how I came to discover my research question. Technology can offer many advantages and disadvantages to student learning. It can cause distractions and lead to cheating and not mastery of content but it can also be used to create more interactive lessons while meeting the individual needs of students. The role that technology plays in the classroom is relevant to investigate how it can be used to benefit student learning and all students in a positive way.

Chapter Two, provides a literature review that examines different studies and research to support the capstone question and project. Chapter two will go in depth at looking at technology use, usage recommendations, the different digital tools available, and how technology can be seen as a drawback in the classroom. The chapter will also look at student learning and engagement and how that plays a role in student learning. Finally, the chapter will discuss how instructional strategies, specifically student centered learning, benefit student learning and how

technology can be used in conjunction with that strategy to support learning. Chapter Three, will provide a detailed explanation of the project. The project will be a professional development series that will teach educators how to use technology as a tool to support a student centered classroom. During this professional development, secondary educators will be given the tools to select digital tools that will enhance student centered learning in their classroom and will walk away with a framework to guide them through the process. They will also leave the professional development with examples of digital tools and how they specifically are used to support student centered learning. The final chapter will provide a reflection on my research question and the process of the capstone project.

CHAPTER TWO

Review of Literature

Introduction

Every year, technology is further developing and the way that technology is being used in our classroom's changes. As we have seen through the Coronavirus pandemic, technology has become a vital part of education. We have seen how technology was and is used to connect teachers and students through the use of digital meetings on applications like Google Meets or Zoom. Applications like these allowed students and teachers to connect with each other from a distance. Digital meetings were being held to teach lessons, to answer questions, and to get students interacting with each other. Learning Management Systems (LMS) like Canvas or Google Classroom were used to not only connect students and teachers but they were also used to help students gain access to content/lessons and accomplish their work while distance learning. Now that we have been navigating through the COVID-19 pandemic for two years, we have seen districts evolve by offering online learning opportunities whether that be full time online learning for students or part-time. By doing this, districts are changing the ways that learning can be done and creating more options for learning. The pandemic has also changed the way that instruction is delivered in the classroom and the way classwork and homework are done.

Technology can be used in many ways, for different reasons and this leads to the capstone question, *How can secondary teachers best utilize technology to enhance student centered*

learning and meet the needs of all students? As technology continues to develop, research is being conducted to determine its effectiveness as an educational tool, the impacts of technology on student learning and engagement, and what the best ways to incorporate technology in the classroom are through different instructional strategies.

This chapter presents an overview of the different roles technology plays in a secondary education classroom. Technology use has many different aspects that can be covered. For the purpose of this capstone, the literature will first examine how technology can be used as an educational tool while keeping in mind the different recommendations of technology use. Next, the review will examine the relationship between technology use and student learning and engagement by looking at the ways that students and teens are using technology inside and outside of the classroom and the effects that it plays on their development and engagement inside the classroom. Finally, the chapter will cover instructional strategies like student centered learning and how different digital applications accompanied by different instructional strategies can be used to positively enhance student learning, comprehension, and engagement.

Technology

Technology has many different ways in which it can be used. This section will examine the rate at which technology is being used and the recommendations at which it should be used. It will also discuss the variety of digital tools that can be used for educational purposes to support student learning and how educators should go about selecting an appropriate digital tool to use. Finally, this section will cover some of the drawbacks that technology brings to our lives and to our classrooms and how that impacts student learning.

Technology Use and Recommendations

The past two years, through the Coronavirus pandemic, have shown us that technology is such an important part of everyday life. People are now fully immersed in the use of technology by having cell phones that do everything, smart watches, and portable computers. Technology is no longer just part of a person's life, so many things that we need throughout our day are accessed through technology. Students access their grades, lunch schedules, school schedules, bank accounts or debit cards, homework, daily lessons, communicate with friends and family, college information, social media, video games, shopping, and so much more right from their handheld devices. According to the CDC (2018), Kids ages 8-18 now spend, on average, a whopping 7.5 hours in front of a screen for entertainment each day, 4.5 of which are spent watching TV. Over a year, that adds up to 114 full days watching a screen for fun (Screen Time vs Lean Time, 2018). This statistic encompasses the amount of screen time, the time spent using a device such as a computer, cell phone, tablet, television, or gaming console for any reason, for kids 8-18 is the amount of time spent for entertainment purposes only. This does not account for the time that they are spending on technology for educational purposes. This amount of screen time can lead to children getting less exercise, spending time with friends and family, gaining weight, developing attention and learning issues, sleep problems, or even lead to obesity (Gavin, 2021). It is recommended by the American Psychological Association (2019) that children ages 2-5 limit their screen time to about one hour a day. When children are 6 years or older it is advised that there are more limits placed on the amount of time children spend on media and the exposure to certain types of media (American Psychological Association, 2019).

Over the past few decades and especially over the past two years, technology has become more prominently used in the classroom. Teachers and schools are using technology in many different ways. The pandemic made educators quickly shift from how things were normally done

to a brand new type of teaching. The COVID-19 pandemic has created a world where teachers were/are required to create online lessons, homework, and assessments (Winter et al., 2021). For many teachers this was a struggle. Talis (as cited in Winter et al., 2021) reported that, “According to OECD’s Teaching and Learning International Survey 40% of teachers had no professional development in technology use and almost 20% saw a high need for more training” (p. 1). The EducationWeek research center survey on how COVID-19 shaped technology use, gathered that educators across the country have increased their technology usage by 46% for educational purposes since the start of the COVID-19 pandemic. Educators have grown by expanding the amount of digital tools they incorporate into their lessons and the use of digital tools to communicate with their students (Bushweller, 2022).

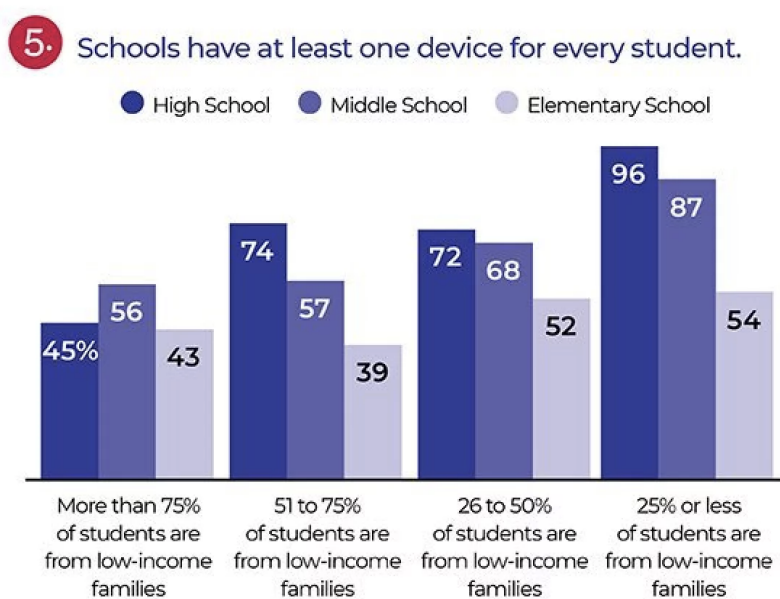
With the increase of technology use in the classroom, instruction and the way that class time is spent has significantly changed. According to the EducationWeek Research Center survey conducted in 2020, on how COVID-19 shaped technology use, educators were asked if the amount of time devoted to certain aspects of teaching has changed due to the pandemic. 87% of educators responded that the amount of time spent troubleshooting technology, their technology or students, has increased due to the changes with technology use due to the pandemic (Bushweller, 2022). Now that many schools and classrooms have implemented one-on-one technology, this has increased the amount of technological issues that are having to be dealt with during class time. Some of these issues may include but are not limited to, dead devices, troubleshooting issues, internet connection issues, or broken devices. While there may be simple solutions to some of these problems, not all technological issues are easily solved and may require the assistance of someone who is trained in technology. It was also reported that teachers are spending about 71% less time on student instruction with the use of technology than they

were before using technology. This could be due to many different reasons like the shift in the need to solve technological issues, or technology enhancing instruction (Bushweller, 2022).

With the use of technology becoming more prevalent in our education systems, school districts have shifted to creating environments where students have access to one-on-one technology. This means that each student has their own district issued device to use for educational purposes. Figure 1 from EducationWeek survey on how COVID-19 has shaped technology use, illustrates the increase of one-on-one technology for students at different grade levels.

Figure 1

One on One Technology



**Results show responses from teachers.*

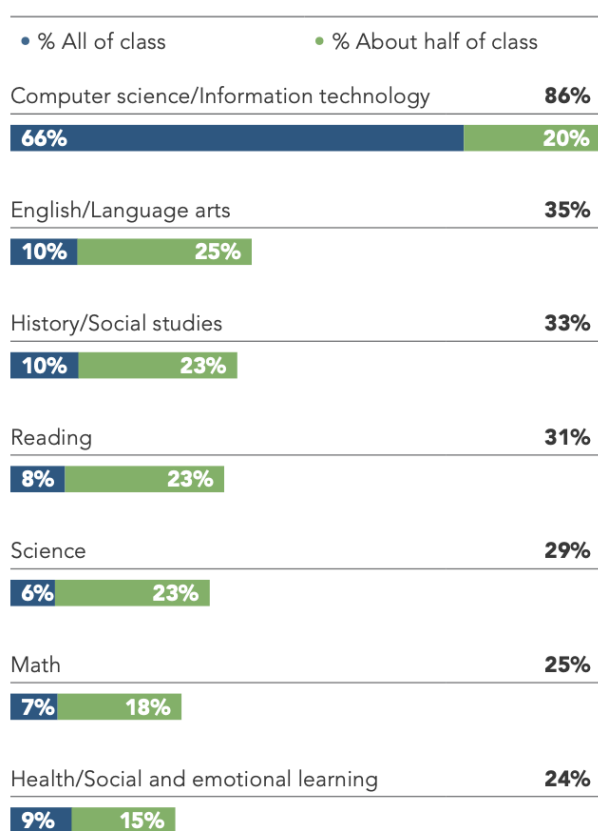
SOURCE: EdWeek Research Center survey, 2020

As seen in Figure 1, middle schools and high schools are more likely to have at least one device for every student in their buildings. According to a study done in 2019, about 95% of teachers are using technology in their classrooms (Nagel, 2019). The use of one-on-one technology is

creating new opportunities for teachers to incorporate the use of technology into their instruction. One-on-one technology allows students to work at their own pace, come back to information as needed, and allows educators to individualize instruction. However, with these new opportunities, it increases the amount of time that students are spending on screen time for educational purposes. Figure 2, illustrates the amount of time secondary students spend on technology using digital tools to support learning during class time. In figure 2 it shows that different classrooms are using digital learning tools at different rates during this class time.

Figure 2

Time Spent Using Digital Learning Tools



Digital Educational Tools

There are many different ways that educators can use technology in their classrooms to deliver instruction and to engage students. According to the EducationWeek survey on how COVID-19 has shaped technology use in 2022, 73% of educators reported that they believed that the use of one-on-one technology will create an environment for higher quality teaching and learning (Bushweller, 2022). However, without the proper training, teachers may not know how to effectively use technology as an educational tool. With the advancement of technology and the increase in one-on-one technology, educators can now use websites, online games, applications, smartboards, and many more digital tools to aid learning. “About two-thirds of teachers (65%) say they use digital learning tools to teach every day” (Gallup, 2019, p. 15). As we saw in Figure 2, students in secondary classrooms spend about half of their classroom time using technology with the support of digital tools.

For a digital tool to be useful, teachers are looking for different aspects that may be beneficial to their classrooms and to their students. About 35% of teachers are looking for digital tools that allow them to see immediate results on their students’ progress. About 30% of teachers are looking for a digital tool that allows them to customize the instruction based on the students’ needs and abilities. Another 30% of teachers are looking for a digital tool that is easy to use and engages students with school and the content they are currently learning. It is also important to educators that the digital tools that they are using in their classrooms support content that aligns with state standards (Gallup, 2019). Digital tools are not meant to replace traditional instruction but to supplement instruction and serve as a resource.

With over thousands of applications and websites for educators to choose from when they are designing their instruction, it is important that educators know how to navigate and select the

appropriate applications. According to the Science of Learning, there are four evidence based pillars of learning that should be followed to help educators select tools that support a learning goal. The four pillars that educators should use as a guideline when selecting digital tools are active learning, engaged, meaningful and social interaction (Hirsh-Pasek et al., 2020). Active learning is the idea that students should have an active role in their learning. Now this does not mean that students are actively learning if they are just clicking or swiping on a screen. This means that the students need to be *minds on* with the content (Hirsh-Pasek et al., 2020). There are many applications that provide distractions to students while using apps. For example, there may be advertisements on the side of the application. These distractions are not allowing students to be minds-on. An application is considered to have met this pillar if it gives the students an “appropriate level of control and agency depending on their age and experience, allowing them to proceed at their own pace and sustain their interest” (Hirsh-Pasek et al., 2020, p. 10)

The second pillar in the learning process is engagement. This can mean behavioral engagement, like following directions or participating, emotional engagement, reactions, or cognitive engagement, students being invested in their learning or problem solving (Hirsh-Pasek et al., 2020). Technology allows students multitask, but this can decrease their engagement with the content or activity that is being performed. Applications that allow students to get immediate feedback, help the students feel in control of their learning, which leads them to staying engaged.

The third pillar in the learning process is meaningful learning. This means that the students are able to make connections with their experiences and existing knowledge (Hirsh-Pasek et al., 2020). Applications that fit this learning pillar, allow students to practice what they have learned and build from their prior knowledge and experiences. This type of

learning will also encourage students to be more motivated to learn and increase their engagement.

The final pillar is social interaction. Educators should be looking for applications that allow students to interact with others in a collaborative way. However, social interaction needs to be high quality for it to be effective when benefitting the students' learning (Hirsh-Pasek et al., 2020). Applications that would fit this pillar, allow students to work face to face or have direct feedback from their peers. These pillars all work towards supporting the goal of finding an application that supports the educator's learning goal for their students.

Variety of Digital Tools

There are many different digital tools that teachers use. Included in the list of digital tools are the uses of one-on-one technology like laptops or iPads for the students. Some of the tools educators may use in their classrooms are Smartboards which allow teachers to project their computers and interact with the screens. Another example of a digital tool that educators use is a learning management system (LMS). Districts use different LMS and one example is Google Classroom that combines Google Docs, assignments, allows for communication between teachers and students, collaboration, and can be used with Google Meets (Climans, 2021). Other examples are Schoology, Canvas, SeeSaw etc. LMS are used to keep instruction all in one place, organize classes, assign, turn in, grade assignments, and track student grades. With the use of one-on-one technology, students can also use Google Apps or Microsoft systems to create documents that allow them to create papers, take notes, create presentations etc. Another digital tool is Kahoot. Kahoot is a quiz tool that also incorporates the feel of a game. It is engaging and easy to use while allowing the students and teachers to access student knowledge. There are

many different digital tools that can be used inside and outside of the classroom that have an impact on student collaboration.

Digital tools can also be used to increase student collaboration. Digital tools like GoogleDocs, Nearpod, Peardeck, or Jamboard can be used to encourage student collaboration with peers, teachers, and the content being taught. A digital tool like Nearpod, can add certain interactive elements to instruction and assignments. Nearpod allows for the educators to utilize polls during their lessons to gauge comprehension or to encourage collaboration and interaction. There are many different tools and features available while using a digital tool like Nearpod. Some of the tools allow students to draw pictures, answer open ended questions, and allow teachers to provide instant feedback to the student's submissions. Not only is Nearpod a great resource for encouraging collaboration but it is also great for assessing student learning. Nearpod is a tool that can be used in the physical classroom and also in a digital classroom.

Another digital tool that can be used to increase student collaboration is Jamboard. Jamboard is a digital whiteboard that allows students to interact with the content and each other simultaneously. It allows the students and educators to manipulate images, content, and allows them to share data in real time (Vijayan, 2017). Like Nearpod, Jamboard has many different tools to use to keep students engaged and interacting with each other. Jamboard creates an opportunity for students to use the drawing tool, upload images/content from other sources like Google, create textboxes, and create post it notes. Jamboard creates a space for whole classrooms, physical or virtual, to interact or it allows small groups of students to interact. Jamboard is a tool to be used by educators to gather information about students' understanding.

To add to the list of digital tools that encourage student learning is an application called Edpuzzle. Edpuzzle is a great tool that allows educators to take any Youtube video and break it

down into sections and insert questions, multiple choice, short answer, or open ended, into the videos (Ware, 2021). This tool promotes student learning by allowing the students to watch videos at their own pace and as many times as they want.

There are a variety of digital tools that also can be used to fulfill the four pillars of learning. Applications like Nearpod allows students to be minds on, engaged, partake in meaningful learning, and social interaction through the design. Nearpod allows students to follow along or individually go through a presentation while answering questions, adding drawings, interacting with the content through games and assessments (Perez, 2017). Educators can create presentations within Nearpod to connect with all four pillars of learning. Applications like Kahoot!, Quizzizz, Jamboard, Google Drive, Google Meets, or Zoom also align with the pillars of learning by providing engagement opportunities for the students and allowing educators to create meaningful content that connects to students' prior knowledge while providing social interaction through either face to face meetings or immediate feedback.

There is an abundance of digital tools available for educators and students and due to this and the COVID-19 pandemic, we have seen an increase of virtual/distance learning. Digital tools like Zoom, Google Meets, GoogleDocs, Nearpod, Jamboard, and learning management systems (LMS) allow teachers and students to learn virtually. Rahayu and Wirza (2021)

Advantages of online learning: flexible in time and place, provide opportunities for relations between learners by the use of discussion forums, helps eliminate barriers that have the potential of hindering participation, including the fear of talking to other learners, motivates students to interact with other, cost-effective, takes into consideration the individual learners differences, permits each student to study at his or her own pace and speed whether slow or quick. (p. 393)

Technology and digital tools have helped virtual learning be successful. Through the use of digital tools and LMS, teachers and students have access to real time information and communication. As mentioned, tools like GoogleDocs, Nearpod, Peardeck and Jamboard allow students to collaborate virtually with each other to encourage their engagement and learning. They also help create student accountability by providing real time interactions and by allowing teachers to give feedback right away. This real time interaction allows these digital tools to be used as formative assessments by educators. By using digital tools to increase student collaboration, educators are also impacting student learning and their engagement.

Drawbacks and Downfalls

As mentioned, there are many aspects to technology and even though technology and digital tools can have positive impacts on the classroom and student learning, there are also some drawbacks and downfalls. As we have seen, technology has allowed for the creation of new spaces for learning. Virtual classrooms are used to connect students and educators from afar but they also come with their downfalls. One of the disadvantages to virtual learning is the lack of interaction the students receive. While learning from a computer, a student does not get the social interaction like they would be in a physical classroom or school environment. They are more removed from society from having to be stuck behind their computer screens. While this environment may help students learn the content and do well academically, they will not be gaining other skills necessary to display or share their knowledge (Rahayu & Wirza, 2020). Even though there are digital tools that can help students engage with each other, they are not getting the same opportunities that they would in a traditional classroom to discuss and collaborate with their peers. In online environments, educators are not always present to help students engage with each other and to help guide conversations.

Another drawback that technology brings to the classroom is that it comes with distractions. Applications can have advertisements that are on the sides of the screen while the students are using it or these advertisements may pop up throughout the application. Some applications have music that is playing in the background (Hirsh-Pasek et al., 2020) An example of this is Kahoot!, there is music playing while students are completing the activity. Not only do applications come with distractions but just having technology in the classroom can be a distraction. If a student is using a Chromebook or laptop, the student can have many different tabs open at one time. This takes away from the activity or content that the students are supposed to be participating in.

Online learning and the use of one-on-one technology also makes it difficult for educators to monitor cheating. Some districts and schools have purchased applications that allow educators to monitor student devices. One of these programs, as mentioned earlier, is GoGuardian. GoGuardian allows educators to monitor district given devices but if a student is using a personal device, they are still able to cheat. When most students are coming to class with their own devices it can make monitoring student work time very difficult. Now, not all districts purchase programs like lockdown browsers or GoGuardian to help their educators monitor student work time on technology and their LMS, where assessments are taken, do not monitor the amount of time students click out of their assessment. Without these programs, monitoring their work time and assessments on technology would sometimes mean needing to be directly behind the student watching their screen. Working with technology means that students always have access to Google and this access, along with not being able to monitor student devices, means that student learning could be hindered. Not only does technology make it difficult to monitor students for cheating but it also makes it difficult to monitor student work time. With having access to

technology in the classroom whether through a school provided device or a personal device like a cell phone, students have so many distractions at their fingertips. Students spend their class time on social media, texting with their friends or watching videos. This can be happening during instructional time or during independent work time. These distractions can have a huge impact on student learning.

Another drawback to technology, as mentioned above, is the time spent dealing with technological issues and the lack of proper teacher training. With the use of technology comes the need for proper training to troubleshoot devices when they are not working. This requires districts to have IT professionals on their staff to help combat the technological issues that arise (Daniel, 2020). Teachers and students are not trained or equipped to handle technology issues as they arise. For example, sometimes computers just do not turn on. This requires someone to know the exact steps to be taken to reboot the computer. These technological issues can interfere with instruction time and student work time, minimizing the amount of time students have to learn and complete assignments. The lack of technology training that is provided to students and educators can also be a downfall to using technology in the classroom. The use of technology in the classroom requires teachers to have the proper training to use technology effectively. With technology comes a whole new list of job duties and responsibilities for educators using it in their classrooms. They must now be able to use a variety of digital tools, for example learning management systems, and be able to troubleshoot any technological problems that arise during their day (Daniel, 2020).

Finally, technology can be seen as a downfall because of the amount of money and resources needed to use technology successfully. As seen in Figure 1, areas with more low income families have less access to technology devices for their students. One of the advantages

for technology and the use of digital tools is that it allows the students to access the information needed and work on their assignments from anywhere. However, even though a district may provide technology to their students, it does not mean that when the student goes home that they will have access to the internet. When relying on technology to provide students with their information, content and assignments online, it can be limiting to those students who do not have access to the internet or a computer at home. The lack of technological access, can play a role in student learning and engagement.

Student Learning and Engagement

We have examined the impact that technology use can have on a student's well being and it is also important to examine the relationship between technology use in the classroom to student learning and engagement. As stated above, there are thousands of applications that can be used as educational tools and teachers are looking for different characteristics when selecting a digital tool to use in their classroom. When selecting a digital tool to use in your classroom, it is important to identify an outcome of what the educator wants the students to take away from the lesson or activity. According to the Science of Learning, it is important for educators to determine a learning goal and select an application that supports that learning goal. (Hirsh-Pasek et al., 2020). When looking at the research question, *how can secondary teachers best utilize technology to enhance student centered learning and meet the needs of all students*, it is important to look at the benefits and downfalls that come along with using digital tools to increase student engagement and enhance student learning. One benefit of using technology in the classroom is that technology has the potential to connect learners, content, and educators to each other from near or far. Having personal devices and one on one technology in the classroom gives students access to many resources which can have a positive impact on their learning

(Moon, 2021). Technology has made it possible for teachers to create lessons online that allow students to access the information they need from the classroom or from the comfort of their own home. This minimizes the amount of content that students are missing while absent and increases the ability for students to collaborate and engage with peers and teachers without physically being in the classroom. Through this, it also allows the parents to be more involved in their student's education by being able to access lessons for their students. It has also made it possible for students to participate in distance learning. When districts create opportunities for students to learn outside of the traditional in person classroom, they are giving the students more flexibility to meet their own learning needs. For example, virtual learning can provide the opportunity for the students to work at their own pace and to access information as many times as they need. The variety of digital tools allows for educators to assign assignments that meet the individual reading levels or learning styles by providing readings or videos with content information (Goedhart et al., 2019).

Not only does technology provide an opportunity to physically connect learners and content inside and outside of the classroom but also provides the opportunity for educators to reach all learners. According to the Office of Educational Technology, The National Education Technology Plan (NETP) creates a national vision to plan for learning enabled by technology (Woodall, 2017). This means that districts are transforming learning experiences with the goal to increase equity and accessibility. The Office of Educational Technology defines equity as the educational means to increasing all students' access to educational opportunities with the focus on closing achievement gaps and removing barriers that students face based on their race, ethnicity, gender, national origin, language ability, identity, socioeconomic status, or a disability.

They also define accessibility as the design of apps, devices, materials, and environments that support and enable access to content for all learners (Woodall, 2017).

Our classrooms are ever changing and no two students are alike. There is a variety in student learning styles, abilities, educational performance, cultures, and socioeconomic status in our classrooms. Technology can help educators create lessons that incorporate the tools necessary to reach auditory, visual, and kinesthetic learners all from one lesson by using a variety of technological tools. Auditory learners, or learners who gather information through listening and speaking can use tools like dictation on GoogleDocs to help process their information. Technology can reach visual learners, those who learn best through reading or seeing a demonstration, through the use of one on one technology, Smartboards, powerpoints, videos etc by providing a visual for the students to reference during the lesson or activity. Kinesthetic learners, those who interact with activities to learn, can be reached through applications that allow them to create projects or play games. Technology allows for the personalization of learning and allows students to have more of a choice. They can choose their pace, how they want to organize or display their information, and how they connect with the content (Woodall, 2017). Technology also creates the opportunity for educators to individualize learning opportunities for different level learners and for those with IEPs, 504 plans, and English Language Learners. Districts now have assistive technology that can help meet the individual needs of students. Some examples of an assistive technology device that districts may use are high-resolution monitors or electronic communication devices (Duhaney & Duhaney, 2000). Applications such as Newsela, allow educators to select news articles that make real-world connections for their students. It also allows the educators to assign the same article at different reading levels based on the needs of their individual students all while simultaneously allowing

the students to work at their own pace (Newsela Inc, 2022). Technology also allows the students the ability to come back and visit sources, content, projects, and complete practice exercises at a later time. Other applications like Notability, which is an interactive notebook, allows students to build organization skills and take responsibility in their own learning. Depending on the technology that the student has (iPad, Chromebook), Notability allows students to write or type on their digital surface in a way that best works for them (Ginger Labs, 2022).

Technology also provides opportunities to increase student engagement in the classroom. This can be done through the use of video tutorials or games, otherwise known as Gamification. According to Brookings, Gamification increases learner engagement by presenting exercises as games and/or by encouraging learners to compete with each other (Ganimian, 2021). The process of using games in our classrooms is not only for entertainment purposes but adding gaming elements helps to enhance learning. The theory behind Gamification is that it can benefit students by stimulating behaviors related to learning (Zaric et al., 2021). Digital learning tools can be fun, interesting, and match students' learning styles and needs. As we have learned, digital applications have many different characteristics and reasons why educators use them in their classrooms.

One reason an application may be used in a classroom is to create more fun and increase engagement. It is important to note that Gamification is not used to replace instruction but is used to enhance instruction (Sailer & Homner, 2019). According to the EducationWeek survey in 2020 about four in ten students wish digital learning tools allowed them to play games (Bushweller, 2022, p. 39). Applications like Kahoot!, allow students a game-based learning experience to study, interact with content, and interact with their peers. One example of a way that Kahoot! can be used in the classroom by using it for a review game. This method gets the

students interacting with the content and will help them form deeper connections with the information and concepts. Using Kahoot! as a review allows the student and educators to see where there are gaps in the understanding of the content (Baszuk & Heath, 2020). Applications like Kahoot! can be used as formative assessments by educators to see individual or classroom understanding. While gamification can increase student engagement, it also has its drawbacks to being used in the classroom. When using Gamification digital tools like Kahoot! it can lead to relying on extrinsic motivation (Colby, Johnson, & Colby, 2013). Extrinsic motivation being the motivation that is related to outside rewards. Gamification heavily relies on extrinsic motivation rewards like points, badges, or scores to keep students interacting and engaged, after time, rewards need to be increased to retain student interest (Colby, Johnson, & Colby, 2013).

There are disadvantages to relying on technology when enhancing student learning and engagement. When incorporating technology into the classroom, it is important to consider the availability of technology, one on one technology or school computer labs, internet connections in the classroom and at the student's homes, and the comfort and experience levels of educators, students, and families when using technology. Every school system is going to perform differently when it comes to the outcomes from technology use due to these disadvantages.

Instructional Strategies

When referring to the research question, *how can secondary teachers best utilize technology to enhance student centered learning and meet the needs of all students*, it is important to identify and define different instructional strategies and pedagogies that are most effective when wanting to instruct student centered learning. Teaching pedagogy: the idea of how teachers teach, the different practices and methods. These teaching methods can differ between individual teachers, school, or district beliefs. For many years, teachers have been running their

classrooms with a teacher-centered approach. This is a more traditional approach to teaching and education. In this approach, the teacher's role in the classroom is as a lecturer, presenter of information to students and then the students passively receive the information (Lathan & Bio, 2022). In this approach, the teacher is typically at the front of the classroom while students usually sit in individual rows. In a teacher centered classroom, knowledge is flowing in a one way motion, from the teacher to the students (Ahara, 1995). Assessments are usually done with the idea that students need to have all of the content information memorized. In this method of teaching, assessments are usually done through the use of fill in the blank, multiple choice, or true-false questions (Ahara, 1995). The idea is that students will master what they are learning from the teacher and from their books. The teacher-centered approach does not allow much room for interactive lessons, collaboration, or for chances to develop critical thinking skills. Even though this method of teaching has been used for many many years, some philosophers did not agree with it and believed that this was not the best way for students to be learning. Dewey, a philosopher and educator, believed that students learn best from natural situations, their interests, and he believed that the traditional classroom was not designed for the development of young minds (Williams, 2017).

Dewey believed that education should create opportunities for students to socially engage with their learning experiences. Dewey's beliefs led to the development of another instructional strategy, the idea of student centered learning/teaching. Student centered learning is the idea that students are in charge of their learning while the teacher acts as the facilitator. The student centered approach differs from the traditional teacher centered approach in many ways. Another theorist and educator, Rogers believed that students need to be placed at the center of the learning process (Chegenizadeh, Nikraz, & Zadeh, n.d). Student centered learning and teaching

really focuses on the needs of the students. This means that the educator, as the facilitator, is creating lessons based on the different abilities, interests, and learning styles of the students in their classrooms. Instead of the teacher teaching from the front of the classroom for the entire period, in this approach, the teacher is engaging the students and encouraging them to teach themselves and to learn from each other. This pedagogy places the importance on the students, their voices and their active participation in learning. This active learning can be seen through hands-on learning, Project Based Learning, and collaboration.

Another way that this approach differs from the traditional teacher centered approach, is the way that the classroom layout is designed. Within a student centered classroom, students sit in flexible groupings. This can be seen in desk/table clumps, a double horse shoe design, or in other ways. The purpose of this is to encourage students to interact with each other. When the students are interacting with each other, they are sharing thoughts and ideas and learning from each other. It is the belief that through a student centered classroom, students will be able to develop their own ideas and develop critical thinking skills.

Differentiation allows for a student centered classroom. With the students at the forefront of their learning and education, the lessons are developed around their needs. With this approach, there is not just one way of doing things. Different ways to differentiate in a student centered classroom is to provide the students freedom to work with a group or work independently or create assignments and assessments in multiple formats. For example, giving the students opportunities to create their own projects or to complete assignments in a way that works best for them.

Technology and Student Centered Classroom

Technology can aid in creating a successful student centered classroom. As we have seen throughout this chapter, technology has the ability to transform a classroom. Technology has the power to individualize learning. Digital tools allow educators to assign assignments, class work, and assessments based on the individual student needs. Technology also allows students to take charge of their own learning by allowing students the flexibility to learn and complete tasks at their own pace. We have seen how Newsela allows students to take learning into their own hands by reading articles designed at their reading level (Newsela Inc, 2022). With over 80,000 applications that are available to educators and that are being labeled as *educational*, it is important that educators select the right technology and digital tools to use in their classroom to add to their student centered classroom. (Hirsh-Pasek et al., 2020)

Classroom Procedures

As previously mentioned, one of the downfalls of technology is that staff and students do not always have the proper training or skills needed to use technology successfully. It is important for teachers wanting to establish a student centered learning community to have classroom expectations, rules, and procedures in order for the use of technology to be successful. When the classroom has clear expectations, especially about the use of technology, the downfalls discussed earlier in this chapter are minimized. As mentioned, most students in a secondary classroom have access to their own personal devices. This could be a cell phone, a tablet, or a smart watch. Usually these devices are brought to class with the student. Creating classroom rules and procedures around the use of personal devices in class can help enhance student engagement and benefit their learning.

Summary

All of the literature and information covered in this chapter is beneficial when referring back to the research question, *how can secondary teachers best utilize technology to enhance student centered learning and meet the needs of all students?* Technology has changed the way teachers teach and the way that students learn. This chapter has provided us with ample information on the different ways technology is used in a classroom, examples of digital tools that educators use, the advantages and disadvantages of using technology in our classrooms, and how technology can be used with different instructional strategies.

The information in this chapter will be used to help create a professional development training for educators in a secondary setting. The project and professional development will address the gap of educators not knowing which digital tools to use in their classrooms to support student learning. The project is important because it will provide educators with the tools and guidelines necessary to select digital tools that will support student centered learning in their classrooms. It is my goal to create this professional development that will provide educators with different digital tools and ways of using these tools in their classrooms to start teaching or continue to teach with a student centered approach. The following chapter will discuss how I will transform this into professional development, the goals of the professional development, and will discuss the ways in which the professional development will be executed.

CHAPTER THREE

Project Description

Introduction

Chapter Two synthesized a variety of research in regards to the use of technology to encourage student centered learning. Chapter Two also provided a variety of digital tools and how they can be used to enhance student centered learning. The research provided a blueprint to address my capstone question: *How can secondary teachers best utilize technology to enhance student centered learning and meet the needs of all students?* Chapter Three will describe the project, a professional development series, that was created to address my research question. The chapter will discuss the goals of the project, the setting, audience, timeline, how it was created, and the rationale. Finally, the chapter will conclude with brief insight to Chapter Four containing a reflection on the project.

Project Description

While reviewing literature for Chapter Two, it was clear that there are so many uses for technology in the classroom to support student centered learning. The literature points out that there needs to be restrictions on how technology is used and how long students should be using it for it to be considered a tool for learning. The four pillars of learning developed guidelines for educators to assess if an application is going to support a learning goal and support student centered learning (Hirsh-Pasek et al., 2020). This project was created to inform and guide teachers on how to appropriately and effectively utilize digital tools to enhance student centered learning that supports a learning goal. The project will provide teachers with the training necessary to effectively select digital tools for their classrooms that will enhance student centered

learning. This section will discuss the goals of the project and provide a detailed description of the project.

Context

Over the past few years and through the COVID-19 pandemic, schools and educators have had to rely on technology to help teach their students. Through the pandemic, it was an adjustment for all involved in education to transition to learning through technology. Educators did not have a choice but to switch to distance learning during this time. COVID-19 not only changed the way that learning was delivered during the pandemic but it has also changed the way that learning is done after the pandemic. For example, teachers are now using more technology in their classrooms to deliver lessons, coursework, and assessments rather than using paper. School districts are now offering more opportunities for students to be distance learners and learn from the privacy of their own homes through technology. However, as the literature states, teachers and students were never taught how to successfully use technology as a digital tool to aid student learning. This means that there is an unbalanced approach in what and how often technology is being used in instruction. The literature in the previous chapter specifically discussed how technology should be used to aid student centered learning. This project was designed to provide educators with the knowledge necessary to help select digital tools that will aid student centered learning, how to use those tools, and how to use those tools to assess student learning and engagement.

Rationale

As seen in the previous chapter, there is a lack of training for educators when technology is concerned. It is important that educators feel confident in the digital tools that they are using so that the tools are effective in enhancing student centered learning and are meeting the needs of

their students. For my project, I will be creating a professional development for educators on some of the ways that technology should be used in the classroom to enhance student centered learning. While thinking about my project, I have been researching different ways to create a professional development and better understand what makes a professional development more valuable. I also read Wiggins and McTighe and focused on their idea of the “backward” design (Wiggins & McTighe, 2011). In the reading they were discussing building a unit lesson plan. Even though I am creating a professional development series, I found this helpful when thinking about constructing a beneficial professional development. I thought that the most important parts that I can use to build my professional development were the different stages and questions provided. These stages required me to think about the actual outcomes I wanted to achieve and how to build the training.

Stage one required the readers to identify the desired results. As it is described in the *goals* section, I wanted the educators to come out of the professional development with different strategies and technological resources that they could use in their classrooms to enhance student centered learning. Stage two called for determining acceptable evidence. This stage got me thinking about the different ways educators can access if the strategies and/or resources are making a difference in their classrooms. This will be covered more in depth in the *assessment* section. The final stage, stage three, was to plan learning experiences and instruction. This got me thinking about how I wanted to run my professional development to make sure that the educators were gaining valuable information and that they saw the training as worthwhile. This stage will be explained more in depth in the *description* section.

To also help create the structure of my professional development, I turned to an article on Effective Teacher Professional Development. Using the educator’s prior knowledge,

collaboration, and allowing time for reflection and feedback were beneficial when creating an effective learning experience for adults (Darling-Hammond et al., 2017). The structure of this professional development was built on the idea that the educators need to work together in small groups to learn from each other. Some of the sessions of this professional development required educators to bring in resources and digital tools that they have previously used in their classrooms to inform other educators about their benefits. After the educators were able to present the digital tools that they use to a small group, they had the opportunity to discuss how they could be used differently, the drawbacks, and how the tool is successful. The sessions drew on the three principles from Darling-Hammond et al (2017) on using the educator's prior knowledge, collaboration, and the ability to reflect.

Goals

The goal of this project was designed to help answer the research question: *How should teachers use technology at a secondary level to instruct student centered instruction and learning?* The goals of this professional development would be to:

1. Have an understanding of a student centered classroom. Specifically on what it means to create a student centered classroom and why it benefits students.
2. Be able to identify the benefits and drawbacks of using digital tools and technology in the classroom.
3. Identify how to select digital tools that will support a student centered classroom.
4. Identify different uses of digital tools to support a student centered classroom in their educational field (ex. Social Studies, Math etc)
5. Have conversations with their peers about other digital tools, uses, success stories, and classroom procedures that support a student centered classroom.

At the end of the professional development, educators will be given the tools to select digital tools that will enhance student centered learning in their classroom and will walk away with a framework to guide them through the process. They will also leave the professional development with examples of digital tools and how they specifically are used to support student centered learning.

Description

Given the goals of this professional development, the training was done in a series of sessions throughout the school year. The purpose of having multiple sessions spread out throughout the school year is because technology is constantly changing and educators need the time to reflect on the effectiveness of the technology they have been using. The digital tools used at the beginning of the year may no longer be beneficial towards the middle of the year. The multiple sessions allow educators the time necessary to explore different digital tools and to provide feedback to others on what worked and what didn't. Also, digital tools are always changing by adding new features to be used so it was important to reassess the digital tools. Having multiple sessions allowed the educators to share and explore digital tools and their effectiveness. Two sessions, two hours each, were held before the beginning of the school year and four mini sessions were held throughout the year that were about an hour long.

The first session was two hours long and was held before the beginning of the school year. The educators came into the cafeteria to find that small groups were already created for them. The groups consisted of educators that taught different grade levels and different subject matters. The layout and construction of the small groups allowed educators to interact with each other while following along with the presentation. Each session required the educators to bring their computers and their curriculum to help interact with the content being shared. The purpose

of the first session was for educators to gain an understanding of what a student-centered classroom is, what it looks like, how educators can create a student-centered classroom, and what the benefits are. After the educators had a good idea of what student centered learning was and why it benefits our students, we looked at the benefits, drawbacks, and recommendations of technology for secondary aged students and how technology could be used as a tool to support student centered learning. Throughout the session, a Google Slides presentation was used to help guide the professional development. The presentation had activities and discussions built into it to help keep the class on track. A Jamboard was also used to increase collaboration between the large group of educators to share their ideas and access their prior knowledge and experiences with student centered learning and technology. The educators had the opportunity to define student centered learning on their own, discuss with a small group, and with the large group. The Jamboard also provided the opportunity for the educators to share how they create a student centered classroom to enhance student centered learning, share what a student centered classroom looked like and sounded like. The session included a five minute break that allowed the educators to get up, stretch, and get a drink if needed. At the end of the session, the educators were asked to fill out an exit card through Google Forms on how they will use what they learned in the session in the first few weeks of school. At the end of the session, educators were able to give examples of how student centered learning benefits students and this was assessed by having the educators fill out a Google Form on how they will use what they learned in the first few weeks of school to benefit the learning of their students.

The second session, also held before the beginning of the school year, was two hours long. The educators came into the cafeteria to find that small groups were already created for them based on random content and grade levels. These small groups were different from the

previous session. The layout of the small groups allowed educators to interact with each other while following along with the presentation. Each session required the educators to bring their computers and their curriculum to help interact with the content being shared. The purpose of this session was to introduce the Science of Learning, the four pillars and how to select a digital tool to support student centered learning in our classrooms (Hirsh-Pasek et al., 2020). A Google Slides was again used to guide the session. The pillars were broken down into sections that allowed the educators to engage with the material as it was being taught. As each pillar was taught, a definition and connection to student centered learning was provided. The educators were then asked to have a discussion with their small group on what digital tools could fulfill the requirements of that pillar. Once the small groups had a chance to discuss, they were asked to put their examples on a Jamboard. There were only two pillars discussed in this section, active learning, and engagement. They were both broken down into this design of introducing it and then having the educators think of examples that could fulfill each pillar. This session also included a five minute break for educators to get up and stretch. The final activity of this session, asked the educators to work with their small groups to come up with a list of questions that could be asked to determine if an application/digital tool fit under the two pillars. Each group was then asked to share with another small group and eventually upload their questions on to a provided Google Doc. This activity was used as an assessment tool to determine the understanding of how to select a digital tool to support student centered learning. At the end of the session, educators were able to create a worksheet of questions that helped identify applications that fit the four pillars and they were able to identify applications that could be used to encourage student centered learning.

The third session was a smaller session of an hour and a half long that was held a few months after school started. The educators came into the cafeteria to find that small groups were already created for them based on random content and grade levels. These small groups were different from the previous sessions. The layout of the small groups allowed educators to interact with each other while following along with the presentation. Each session required the educators to bring their computers and their curriculum to help interact with the content being shared. The purpose of this session was to introduce the final two pillars: meaningful learning and social interaction. The design of this session was the same as the previous session and also used Google Slides to guide the presentation. The pillar was introduced and made a connection to student centered learning. The educators were then asked to have a discussion with their small group on what digital tools could fulfill the requirements of that pillar. Once the small groups had a chance to discuss, they were asked to put their examples on a Jamboard. The activity for this session was the same for the previous session. The educators were asked to work with their small groups to come up with a list of questions that could be asked to determine if an application/digital tool fit under the final two pillars. This session also included a five minute break for educators to get up and stretch. At the end of this session, the groups were mixed to discuss the questions that they came up with. Finally, the groups were asked to upload their list of questions to the provided Google Doc, this was the same doc from the previous session. This activity was used as an assessment tool to determine the understanding of how to select a digital tool to support student centered learning. At the end of the session, educators were able to create a worksheet of questions that helped identify applications that fit the four pillars and they were able to identify applications that could be used to encourage student centered learning.

The fourth session was held a few months after the third session and was only an hour long. The educators came into the cafeteria to find that they could create their own small groups based off of their content areas. Allowing the educators to create their own small groups for this session meant that the educators could have discussions based on similar grade levels, interest areas, or content areas. The layout of the small groups allowed educators to interact with each other while following along with the presentation. Each session required the educators to bring their computers and their curriculum to help interact with the content being shared. The purpose of the fourth session was to discuss different apps/digital tools that can be used in our classrooms to support student centered learning. The session started with recapping what to look for when selecting an application that supports a learning goal. The groups were then asked to use the Google Doc of questions created in the previous sessions to narrow down and create a solid list of questions/guidelines that can be used when looking for an effective digital tool. After the small groups came up with their list of questions, they were introduced to the four pillars in quadrants on the Google Slides presentation. It was their job to work with their small groups to come up with five different digital tools that they have used in their classroom and determine where they would fall in these quadrants to determine their effectiveness. An example was provided to them before they were asked to work on their own. A discussion was then held as a large group to determine how they found where each digital tool fell in the quadrants. The final activity was to finalize a list of questions/guidelines that all educators can use to determine if an application/digital tool fits the four pillars and supports a learning goal. At the end of this session, educators were able to identify where applications fall on the four pillars.

The fifth session was held later in the year and was an hour long. The educators came into the cafeteria to find that small groups were already created for them. The groups consisted

of educators from different content and grade levels so that they would get an understanding of how digital tools are used at different levels. These small groups were different from the previous sessions. The layout of the small groups allowed educators to interact with each other while following along with the presentation. Each session required the educators to bring their computers and their curriculum to help interact with the content being shared. The purpose of this session was to discuss how to identify applications and digital tools that support a learning goal. At the beginning of the session, different digital tools were introduced to the educators through a Google Slides presentation. A Google Slides presentation was created to give the basic information about digital tools like Nearpod, Kahoot!, Jamboard, Peardeck, Newsela, and Quizizz. After each digital tool was presented, the educators were asked to give one example of how they could/do use the digital tools discussed to support a learning goal and student centered learning. The educators were then asked to use the GoogleDoc provided to write about different digital tools that they use within their classroom based on their content and curriculum. They had to provide what they use the application for and their experiences with it. Once the educators had time to do this, they were then free to meet with other small groups to discuss the digital tools and applications others use in their classroom. This session was about the educators talking to each other and learning the benefits of using other applications in their classrooms. Throughout the year, a Google Slides presentation was created for educators to upload the digital tools that they find effective to share with the school. At the end of this session, educators were able to identify applications and digital tools that support a learning goal. This session was assessed by having the educators create a goal for their own individual classroom for using digital tools to enhance student centered learning. This was then submitted as a Google Form.

The final session in this series was only thirty minutes long. The educators came into the cafeteria to find that they can create their own small groups. Allowing the educators to create their own small groups, made it possible for educators in similar grades and content areas to work together and discuss. The layout of the small groups allowed educators to interact with each other while following along with the presentation. Each session required the educators to bring their computers and their curriculum to help interact with the content being shared. The purpose of this session was to discuss how educators used different digital tools/applications to support student centered learning throughout the year. Educators were given a short amount of time to update the Google Doc with new information on digital tools and then were given time to rotate around the room to discuss different digital tools that they have used throughout the year and their pros/cons to support student centered learning. Through this, the educators were able to talk and learn from each other's experiences. The final assessment of this series was to have the educators turn in a reflection through Google Forms on the different digital tools that they have used in their classroom to support student centered learning. The assessment asked the educators to identify the application/s they used, how they used it, how it supported learning, and what the pros and cons were. They were also asked to reflect on how the information they learned during the series would affect their lessons and curriculum by using technology to enhance student centered learning.

Setting and Audience

The concepts and some of the tools used throughout this professional development could be applicable for all educators but this series was specifically designed for educators in the secondary setting. The school used for this professional development was a suburban middle school in Minnesota. All teachers grades 6-8 will attend this professional development because

each discussion point and digital tool talked about can be changed to meet the needs of a specific grade level. However, when doing small group work the groups have the opportunities to meet with their appropriate grade levels and in small groups of mixed grade levels. This middle school has about 1,000 students in 6th to 8th grade and about 50 teachers. The student population consists of about 83% white, 5% Asian, 3% Latinx, 2% Black, and 1% Native American students. About 10% of the student population is on free or reduced lunch. As mentioned, this professional development series could be adapted for grade levels K-12. It is my hope that it can be used in the future to benefit all educators that are integrating technology into their classrooms.

Timeline

This project was completed over the course of about three months in the summer of 2022. About a month and a half were used to research professional development structures and appropriate material for the series. The rest of the time was spent creating the necessary documents that were used in this professional development like the Jamboard and the Google Slides, finalizing the details, and reflecting on the capstone project work. Due to this timeline, the professional development series can be put into use for the 2022-2023 school year.

Assessment

To assess the professional development's effectiveness, the sessions had individual assessment points. The point of doing multiple assessments throughout the series was to determine if concepts needed to go further in depth and to determine if future sessions needed to be adjusted. The assessments required the educators and those leading the professional development to reflect on the effectiveness of the sessions. The first session was assessed by having the educators fill out a Google Forms asking them how they will use what they learned in the first weeks of school. The purpose of this assessment was to see how educators planned to

use their new knowledge of student centered learning to benefit their students in the first weeks of school. The assessment for the second and third session was done by having the educators submit a list of questions on a Google Doc that were centered around the Science of Learning four pillars. The purpose of this assessment was to determine if the educators grasped the concept of the pillars and what an application/digital tools needs to have in order to fit under those pillars. In the fourth session, an assessment was done through the use of Google Slides. The educators were asked to analyze different digital tools that they have used in their classrooms to determine where they fall within the four pillars. The purpose of this assessment was to ensure that the educators were able to apply their knowledge on the four pillars to applications they will actually use in their classrooms to support a learning goal. The fifth session was assessed through the use of a Google Form. The educators were asked to create a goal for their classroom to use a digital tool to support student centered learning. The final session required the educators to submit a reflection on different applications/digital tools that they have used throughout the year and how it supported student centered learning.

Summary

The professional development series described in this chapter was created to address my capstone question: *how can secondary teachers best utilize technology to enhance student centered learning and meet the needs of all students?* It was the goal of this series to provide educators with the information and resources needed to use technology as a tool to enhance student centered learning in their classrooms. For technology to be used effectively, educators must feel comfortable using it and this series was designed to teach educators how to use and select a variety of digital tools that support a learning goal. This project was designed around the principles of an effective professional development discussed by Darling-Hammond, Hyler, and

Gardner (2017). The series created the opportunities for educators to learn, collaborate, reflect, and provide feedback with each other about their previous backgrounds with technology, what technology works, what is not working, and possible solutions.

Chapter Four provides a reflection on the capstone project and process and how it went about answering the research question: *how can secondary teachers best utilize technology to enhance student centered learning and meet the needs of all students?* This chapter will discuss the limitations and successes of the project and finally how implications that the project will have on others.

CHAPTER FOUR

Introduction

The purpose of this capstone and project was to answer the question: *how can secondary teachers best utilize technology to enhance student centered learning and meet the needs of all students?* This question was approached in a couple of different ways. Chapter one covered my journey while growing up with technology to working in a field that is implementing more and more technology. Chapter two looked at a variety of sources in a search for answers to my research question. It covered technology and the ways that it can be beneficial or a drawback in the classroom. It went in depth on the different ways that technology can increase student learning and engagement. Finally, it covered different teaching strategies while focusing on the importance of student centered learning. In chapter three, the information and sources from chapter two were used to build a professional development series for secondary educators to find meaningful ways to use technology to support a learning goal and student centered learning. All three of these chapters led to the creation of my project.

Chapter four, is a reflection of the capstone process and project. It will also cover how the information from the literature review provided the foundation to creating the professional development. The chapter will also cover the potential limitations and the areas for growth and the implications on secondary teachers and students. Finally, the chapter will discuss potential outcomes for the future followed by a summary.

Reflection

I decided to approach the capstone course the semester after I finished my student teaching. I came to this decision because the idea of centering my capstone project around technology came from my experiences while student teaching and coming out of the COVID-19

pandemic. I wanted to start my capstone project while these experiences and ideas were fresh in my mind and while the topic of technology was very relevant in the world of education. I knew that as I am starting my teaching career, technology and my project are going to be really relevant to my career. Throughout this process, I have had the opportunity to research different digital applications that will benefit me in my career as a teacher. There are so many different applications available to teachers and students and this process has allowed me the opportunity to explore and evaluate the effectiveness of some of these applications in terms of student learning. I am grateful that I started the capstone process before I became a full time classroom teacher because it allowed me more time to become prepared with tools to benefit student learning.

This process has been extensive, time consuming but also so rewarding. This capstone was the most research that I have ever had to do for a class. This process taught me the importance of using multiple sources, how important time management can be, and how important organization is. As I researched, I found that some articles were packed with great information that would then give me ideas of different directions that I wanted to research. However, I also found that some research avenues fell short and would lead me to dead ends. This required me to think outside of the box to really find the information that I was looking for. As a researcher, the capstone project taught me the importance of researching a variety of topics and ideas even if they only had small connections to my research question. Some of these small connections led me to great sources and even better ideas.

The capstone project taught me a lot about myself as a writer. I learned that writing does not have to be this structured process of writing chapters and sections in order. I found it easier for me to write sections as I found the information or as ideas popped into my head. I struggled when I tried to write sections in order because that is not the way that my brain was processing

information. This process also taught me that it is okay to have multiple drafts to my writing and that this helped me organize my thoughts and information.

I learned a lot about myself as a learner through this process. I learned the best practices for me to research, to track my thoughts and data, and how to write a paper based on all of the information that I had gathered. Overall, the capstone taught me the importance of staying organized and not procrastinating. Having a way to organize my thoughts and the data that I was collecting was essential to my success throughout the writing process and to the creation of my project.

Literature Review Highlights

Since I am not a current classroom teacher, the literature review in chapter two served to be very beneficial as I explored information to answer my research question: *how can secondary teachers best utilize technology to enhance student centered learning and meet the needs of all students?* I choose to look at three different sections to collect a variety of important information to help me answer my research question. Technology, student learning and engagement, and instructional strategies were the three topics that provided the most relevant information to help me answer my research questions and create my project.

Technology

Technology is such a broad topic and can be researched in a variety of ways. To ensure that the research was providing me with information that was essential to my research question and project, it was important to gather information about the variety of digital tools that are available to educators and students. There are over 80,000 applications that educators can use that could be classified as educational tools (Hirsh-Pasek et al., 2020). The variety of digital tools can make it difficult for educators to select a tool that is going to benefit student learning. This

section of the literature review was important to the creation of the professional development because it introduced the 4 pillars to selecting a digital tool that supports a learning goal (Hirsh-Pasek et al., 2020). In sessions two through six of the professional development, they covered how educators can use these pillars as guidelines when selecting digital tools to use in their classrooms to ensure that the tools are supporting a learning goal.

Student Learning and Engagement

The second section of the literature review reviewed ways in which students are engaged in the classroom and how this impacts their learning. This section was important to the professional development because it examined the relationship between technology and student learning. Technology allows for the personalization of learning and allows students to have more of a choice. They can choose their pace, how they want to organize or display their information, and how they connect with the content (Woodall, 2017). This section also looked at how different digital tools can individualize learning and increase engagement. For example, Newsella allows students to read articles set at their reading level and allows them to read at their own pace (Newsela Inc, 2022). During the professional development, educators learn about different digital tools and how they can incorporate them into their classrooms to increase student learning and engagement.

Instructional Strategies

The final section covered by the literature review was important to the professional development and research question because it examined the importance of student centered learning. During the first session of the professional development, educators discussed student centered learning and the importance of it to our students. This section in the literature review

provided the background information on student centered learning and how we can use technology to enhance student learning in the classroom.

Potential Limitations and Growth

The professional development is centered around secondary educators, educators teaching middle or high school. This is a limitation because the applications discussed and used in the series are centered around the ideas that students and educators in middle to high school will be using them. This professional development series has the potential to be beneficial for all educators K-12 but would need to be adjusted and broken down based on the grade level. If the series was broken down between grade levels, more applications could be discussed and introduced as students in elementary school use different applications than students in high school. Another limitation could be that educators attending this series may not have enough experience using a variety of digital tools. If this were to be the case, there would not be enough tools introduced for the series to benefit all educators. However, there is an opportunity for growth here by the presenters introducing more tools during the series vs the educators having to provide examples of tools that they have used.

Implications for Stakeholders

Technology is playing such an important and large role in our education system, especially after the COVID-19 pandemic. My research question: *how can secondary teachers best utilize technology to enhance student centered learning and meet the needs of all students*, focused on the importance of secondary teachers using technology and the impact that has on the students and their learning. The goals of this project as mentioned in chapter three were to:

1. Have an understanding of a student centered classroom. Specifically on what it means to create a student centered classroom and why it benefits students.

2. Be able to identify the benefits and drawbacks of using digital tools and technology in the classroom.
3. Identify how to select digital tools that will support a student centered classroom.
4. Identify different uses of digital tools to support a student centered classroom in their educational field (ex. Social Studies, Math etc)
5. Have conversations with their peers about other digital tools, uses, success stories, and classroom procedures that support a student centered classroom.

The goals of this professional development imply that teachers will leave with the knowledge to use technology to create a more student centered environment, overall benefiting student learning. The series provides secondary teachers with the tools necessary to not only effectively select digital applications that are going to support a learning goal but also provides them with examples of applications and how they can be used in the classroom.

The professional development will also play a role for secondary students. Students will benefit from their teachers completing this professional development because they will get the opportunity to use a variety of digital applications in their classrooms that allow for more individualized learning. By incorporating a variety of digital applications into lessons and using what teachers learned from the 4 pillars on how to select a digital tool that supports a learning goal, the students will be more engaged and have more control of their learning (Hirsh-Pasek et al., 2020).

Future Research

Technology is something that is constantly evolving and is not going to go away. It is going to make more and more of a presence in our classrooms. As technology is continuing to evolve, it will be important that educators are using technology in a purposeful way and are

examining the effects that technology has on our students. Research will need to be done to evaluate the most effective practices when using technology in our classrooms, the new technology will constantly need to be evaluated, and the effects technology has on student development will need to be continually researched.

Conclusion

Chapter four examined the capstone process and what I learned about myself as a researcher, writer, and learner. It summarized the importance of the literature review to the professional development project and my research question: *how can secondary teachers best utilize technology to enhance student centered learning and meet the needs of all students?* It explored the implications on teachers and students and discussed the need for further research.

My capstone project, a professional development series, was designed to give secondary teachers the knowledge and tools necessary to select digital tools that serve an intentional purpose to support student centered learning. This project is the start of what I hope can be constantly adapted to meet the evolving needs of teachers and students when concerning the use of technology in the classroom.

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