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Technology Resistance: Helping Administration Stop It in Our Schools

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**Technology Resistance: Helping Administration
Stop It in Our Schools**

by

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A Portfolio

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Chapter I: Introduction

The students that are in schools today are referred to as “digital natives” or “Net generation” because of how technology has been in their lives since they were born (Hicks, 2011). On average, students from ages 8 to 18 spend 7 hours and 38 minutes every day using technology. “The saturation of technology in students’ lives has produced an entirely different type of student, shaping the way they think, learn, and experience the world around them” (Hicks, 2011). This results in a need for technology in schools instead of just a luxury.

Since 2001, the government has awarded states financial assistance to help adopt new technological standards. The No Child Left Behind legislation in 2002 and the Race to the Top Legislation of 2009 emphasized the value of incorporating computer technology into teacher lesson plans. Schools have been trying to adopt computer technology since then, but studies show that teachers are the main obstacle (Colandrea, 2012).

Hicks (2011) explains that the “school setting has undergone drastic reformation in a very short period of time because of the advancements in technology that we enjoy today, and with this change comes an alteration in the job description of teachers. The new job requirement-one must be tech savvy” (p. 188). Technology is not going away. Teachers now need to be life-long learners in technology because the learning curve doubles every 18 months (Hicks, 2011).

A technology integrationist is an administrator that helps teachers incorporate technology into their classrooms (Five reasons you need a dedicated tech integrationist, 2015). They provide knowledge, tools, and experience to any teacher who is willing to ask for help or guidance. Even though it is the teacher’s job to do this, there are many teachers who are not integrating technology at all and some who do it sparingly. In the past decade, there have been studies (Colandrea, 2012; Jones, 2017; Michael & Yeow Ling, 2015; Singleton, 2017) inquiring the

reasons why teachers are not integrating technology. Although researchers have asked why and tried to figure out what the barriers, it is still happening in schools all over the world.

The expectations of teachers are increasing, so it should not be a surprise that their levels of stress increase where technology is involved. Michael and Yeow Ling (2015) state that teachers need to “juggle technology use, redefine their roles as facilitators rather than supplier of information, and manage an ever-demanding class” (p. 3). Even though teachers are encouraged to embrace technology, their attitudes and beliefs concerning technology reflect their pedagogical practice (Singleton, 2017). There is a need to understand why some teachers embrace technology while other’s attitude towards technology needs improvement (Singleton, 2017).

There are many reasons why technology in education is becoming so popular. According to Flair (2013), the textbook dilemma is the main focus. As textbooks are moving to online, it makes it easier for students to search for what they are looking for, not as heavy to carry around, and are less expensive. These opportunities along with the advantages of online classes and programs make technology in education beneficial (Flair, 2013).

Context and Background of the Theme

Singleton’s (2017) study concludes that since attitude and perception are what lead to greater use of technology in the classroom, her study was to understand what can help teachers change their perception of technology. This perception of technology stems from lack of time and training on how to incorporate the technology that the teacher is given (Singleton, 2017). “Factors such as philosophical beliefs regarding technology were revealed as strong determinants to the resistance of applying technology in teaching and learning” (Singleton, 2017, p. 3).

Resistance is defined as an opposing or retarding force (Merriam Webster Online, 2011). Many people wonder, why is this still present in our technological time? Why do some teachers

still resist to learn to use technology? Moerschell (2009) wrote an article called *Resistance to Technological Change in Academia*. In the article, it states that there is an “array of attitudes towards technology from ‘the old timers who like things as they are’ to the lack of awareness and interest to envision the benefits of technology” (para. 8-9). Moerschell developed five reasons why teachers resist: 1) comfort, 2) limited vision of future, 3) deficits in communication and information, 4) individual’s nature to be uncooperative, and 5) do not have skills to do what leader is proposing (2009).

Rationale

This portfolio was created due to a need to help administration prevent technology resistance in school districts. Ngafeeson (2015) explains that this is not an isolated resistance found only in school districts but also in businesses and educational organizations throughout the world (p. 58). As technology is integrated into job tasks and personal lives more and more in the outside world, schools need to prepare students. “Users continue to struggle with new technology because technologies are constantly changing and there is increased pressure on employees to develop their skills so that their organizations can stay competitive” (Siegel, Acharya, & Sivo, 2017).

Even though the administration is in charge of putting the technology into the classrooms, teachers need to have the skills, drive, and knowledge to teach our students the skills that are necessary after they leave high school. Teachers will be doing the students a disservice if they do not teach them those skills. The students will fall behind in the outside world. Hicks (2011) explains,

It is our duty to challenge the minds of our young people and strive to provide them with a quality educational experience that will benefit them now as well as later in life.

Technology directly affects every aspect of life, and nearly every job option available to Americans today require the use of some type of technology. Thus, it is imperative that we use technology in the classroom, as the ultimate success of our students depends on this fact (p. 190)

School districts are purchasing the technology for teachers to use in their classrooms, but they are not providing teacher time to use the technology, so they feel comfortable with it in their classroom (O'Hanlon, 2009). O'Hanlon also mentions that the number one reason why teachers are hesitant to effectively use technology is because of the fear of looking stupid in front of the tech-savvy students (p. 189). Stein, Ginns, and McDonald (2007) explain that teachers are also hesitant because of the lack of professional development regarding technology use and technical support for troubleshooting problems. Teachers may not feel that the benefit will outweigh the cost or do not see a true need for technology (Hicks, 2011). In this portfolio, there are staff development opportunities that will help the administration prevent technology resistance in schools because "technology in the classroom is a must-have attention keeper and ultimately meets the needs of digital natives" (Hicks, 2011). The staff development projects are developed for teachers in the district.

Significance

The projects created in this portfolio will help the administration prevent technology resistance. Baby boomer teachers are starting to retire and are being replaced by new teachers that will be using technology in the classrooms and be more influential in our educational system (Hicks 2011). The projects in this portfolio will give a broad spectrum of how technology can be used and why technology should be used in the classroom. The staff development trainings were created to inspire, give examples, examine standards, and introduce new ways to be creative with

technology.

Definition of Terms

21st Century Skills: The skills and knowledge students need to succeed in work, life and citizenship, as well as the support systems necessary for 21st century learning outcomes (Framework for 21st Century Learning-P21, 2018).

Administrator: The principals in each of the elementary, middle, and high schools along with the superintendent and curriculum director of the district.

Constructivist: A theory that is based on observation and scientific study—about how people learn. It says that people construct their own understanding and knowledge of the world, through experiencing things and reflecting on those experiences (Constructivism as a Paradigm, 2018).

Innovation: A “new idea, device or method”. However, innovation is the application of better solutions that meet new requirements, unarticulated needs, or existing market needs (Innovation, 2018).

Instructional Technology: The branch of education concerned with the scientific study of instructional design and development. The main purpose of instructional designers is to create engaging, effective learning experiences (Kurt, 2017).

Motivation: The needs, desires, wants or drives within the individuals. It is the process of stimulating people to actions to accomplish the goals (What is motivation, 2018).

Pedagogy: The art, science, or profession of teaching (Definition of PEDAGOGY, 2018).

Resistance: A force that tends to oppose motion (Definition of RESISTANCE, 2018).

Staff Development: The training time where teachers gather together to enhance their

knowledge and skills.

Technology Integrationist: A specialist who provides leadership, staff development, and instructional support to all instructional and administrative staff.

Traditional Classroom: Model where the teacher stands between the students and the knowledge (Webdesign, 2018).

Transformative Classroom: A class atmosphere that promotes skills that are critical for success both in and outside the classroom (Registrar, 2018).

Summary

The lack of support from administration or leaders can be a significant deterrent when it comes to a teacher wanting to be innovative. Administration provides new technology for the teachers but do not use time and professional development training (Singleton, 2017). “Often, the teachers who resist change are not rejecting the need for change but are resisting entering into something that they do not have the necessary knowledge and skills for” (Michael & Yeow Ling, 2015, p. 3). Colandrea (2012) explains that if administration wants teachers to become innovative, the administration must facilitate the change.

In the literature review in Chapter 2, a discussion about transforming the mindset of teachers regarding technology integration will occur. This includes the motivation and innovation of our teachers. At the end of the chapter, it will examine models that have tried to answer why teachers and other people resist technology. Chapter 3 will outline the projects that were created for this portfolio based on the research of how to help administration with teacher resistance.

Chapter 4 will show the projects created along with data collected from the projects. In

Chapter 5, there will be a reflection on the projects in the portfolio.

Chapter II: Literature Review

Introduction

In the United States, funding has been given to schools to improve instructional technology (Singleton, 2017). Even with the most current technology, the expectations to apply and improve student learning have not been met (Singleton, 2017). According to Michael and Yeow Ling (2015), internet access in schools jumped from 35 to 100% between the years of 1994 and 2005. Even with internet access, only 40% of teachers said they used technology for instructional purposes (Jones, 2017). According to Singleton (2017), “Children are now growing up in a digital world where technological devices (e.g., iPads and Chromebooks) are replacing traditional educational resources such as paper-based textbooks and lectures” (p. 1).

Singleton (2017) asks the question, “is it reasonable to expect that education be positively influenced by the use of computer technology if the teachers are not committed to using it in effective ways?” (p. 81). Innovation can sound like a scary word to some people. The process of innovation was explained by Rogers’ diffusion of innovations theory (1995). The theory says that an idea that is new is either accepted or rejected by people with similar characteristics over a certain time period.

Methodology of Literature Review

The primary tool used for researching and gaining insight into this topic was the internet. The primary search engine used was the St. Cloud State University library database. The other search engine used was Google. Search terms for finding information for this portfolio were “technology in education”, “technology resistance”, “pedagogy in the classroom”, and “innovation”. There was a vast amount of information on this topic since this problem is so

popular in many different areas. The St. Cloud State University database was used most often, so the full text online articles could be printed.

Theme

Koehler and Mishra (2009) said that “at the heart of good teaching with technology are three core components: content, pedagogy, and technology, plus the relationships among and between them” (p. 62). Shulman (1986) defined pedagogical and technological knowledge (PTK) as “the understanding of the processes and methods including practices through which teaching, and learning are conducted, managed, and assessed” (n.p.). The Merriam-Webster dictionary (2018) defines pedagogy as “the art, science, or profession of teaching.” Koehler and Mishra (2009) explains that PTK is also the ability to select and apply the correct technology to the lesson plan that the teacher is creating. Lesson plans should consider the needs of the learner and the learning standards. The ability to integrate technology correctly into lesson plans should be taught in teacher education programs much earlier than they are currently doing (Vannatta & Beyerbach, 2000).

The Constructivist Theory is the study of how people learn using scientific study and observation. According to *Constructivism as a Paradigm for Teaching and Learning* (2018), “people construct their own understanding and knowledge of the world, through experiencing things and reflecting on those experiences.” When people have new experiences or get new information, they reflect on it and either settle on it from earlier ideas or experiences, change their own ideas or beliefs, or find it unnecessary (Constructivism as a paradigm, 2018). A teacher’s job is to build on student’s existing knowledge and help them do experiments and real-world problem solving to gain new knowledge.

Ertmer (2005) explains that, in general, “low-level technology uses tend to be associated with teacher-centered practices while high-level uses tend to be associated with student-centered, or constructivist, practices” (p. 26). For a teacher to become such an expert on constructivist practices using technology, Ertmer (2005) says that it usually takes 5 to 6 years. Teachers need the ability to make the choice on if they want to adopt, adapt, or reject this way of teaching (Ertmer, 2005). For schools to become fully integrated using technology in educational settings, there is a need to study teachers and find out what makes or does not make them use technology. “It’s not a problem of resources, but a struggle over core values” (Ertmer, 2005).

According to Singleton’s study (2017), “if the vehicle used to promote technology is not sufficiently trained or prepared, then it is merely a false sense of teaching new materials in the same traditional manner” (p. 1). The teachers need to learn how to incorporate technology so that it can strengthen learning in their classrooms (Singleton, 2017). Teachers are required to change from the traditional teaching of the past to being transformative (Jones, 2017). This transformative teaching includes the need to be student-centered which demands the students take a more active approach in their learning (Singleton, 2017).

Ertmer (2005) explains that computers only serve as a “valuable and well-functioning instructional tool” in schools and classrooms if four things happen: the teachers 1) have convenient access, 2) are adequately prepared, 3) have some freedom with the curriculum, and 4) hold personal beliefs aligned with a constructivist pedagogy. Some schools do not have all of these variables, but this is starting to change (Ertmer, 2005). Teachers are starting to use technology, but many are using it for low-level tasks, such as word processing, practice skills, and internet research. Few teachers are using it higher-level tasks, such as project-based work.

A survey was reported by Ertmer (2005), where Michigan teachers were given laptops and had to report on how they used them. Most teachers knew how to use the web and send emails, only a few knew how to use high-tech tools, such as spreadsheets and presentations to add to their lesson plans. Those teachers who are using high-tech tools are being innovative.

According to the Merriam-Webster dictionary (2018), innovation is defined as a “new idea, method, or device.” When technology is innovated, it is classified into two categories: product or idea technologies (Surry & Land, 2000). The software and hardware innovations are product technologies. These can include multimedia, internet connectivity, CD-ROM technology, memory, processing speed, storage space on the computer (Surry & Land, 2000). Idea technologies help show the teaching-learning-technology partnership. This innovation centers around the saying ‘what can be’ instead of ‘what is’ when it comes to learning.

Since innovation is so important in the teaching realm, E. M. Rogers (1995) developed a theory called the *Theory of Individual Innovativeness*. This theory states that people are “inherently more or less predisposed to innovative behavior.” His theory explains that only a few people will immediately innovate right after an idea is introduced to them. Some people will wait until the innovations have been refined before adopting them (Surry & Land, 2000). Innovation is becoming a major topic in schools. It has not only been pushed by law-makers, but administration as well. To be innovative, teachers need to have the desire to put in the time and work.

If a teacher is not motivated to be innovative, then they will get no results or very little results. According to Chigona, Chigona, and Davids (2014), “motivation is the characteristic that pushes an individual toward acting, performing actions, and achieving” (p. 2). If a person is motivated, then there will be positive results and achievements (Chigona et al., 2014). This

motivation can be intrinsic or extrinsic. The goal of this study is to find out what motivates teachers to be innovative. Does it come from intrinsic or extrinsic motivation? Some teachers do have the passion to use technology in their lessons and may get the necessary skills to use it but still do not understand how to add it to their pedagogical knowledge to use it effectively (Hasselbring et al., 2000).

The ARCS Model of Motivation was created by John Keller. Keller (1983) says “motivation refers to the choices people make as to what experiences or goals they will approach or avoid, and the degree of effort they will exert in that respect” (p. 389). Keller’s four categories of motivation are methods to help motivate teachers to use technology. Attention gaining is the first category. The goal is to increase curiosity and arousal by showing different types of technology and their uses. The second category is relevance. The goal is to fulfill important personal needs by showing technology in a way that helps the teachers with retention, tenure, and promotion decisions. Confidence building is the third category. The goal is to increase expectancy for success by providing opportunities to help master the technology and give a support system. The last category is satisfaction. The goal is to attain intrinsic and extrinsic rewards by showing how technology can help the teacher be more effective or efficient or provide incentives and rewards (Keller, 1983).

The methods of teaching are changing because the needs are different, and the learners are different (Wei-Chieh Wayne & Okojie, 2016). In 2010, Inan and Lowther conducted research showing that the years of teaching experience and age did have a negative influence on technology integration. In 2011, Okojie, Boulder, and Boulder found that those teachers who had more years of teaching experience and were older were also less competent when using or integrating Microsoft applications into their lesson plans. Wei-Chieh Wayne and Okojie (2016)

concluded that this may be because the veteran teachers were not trained to the significant use of technology in lesson plans became the norm. When it comes to technology integration, professional development for teachers have become a “one-size-fits-all” (Koehler & Mishra, 2009).

Technology use in schools, according to Inan and Lowther (2010), can be grouped into three groups. The first group is teachers using technology for instructional preparation, such as email, collaborating with peers, emailing parents and students, locating digital resources, and creating lesson plans. The second group is teachers using technology for instructional delivery. This group of teachers use technology by having the students or themselves use technology such as the projector, drill and practice, tutorials, and simulations. The last group of teachers use technology as a learning tool. In this group, students use basic software applications to further their learning and solve problems, create projects, and communicate and share their work.

Inan and Lowther’s (2010) research showed that the years of teaching did have a significant negative influence on computer proficiency. The research also concluded that computer proficiency decreased with age and years of teaching experience. A teacher’s age did affect their feelings of readiness to use technology in their lesson plans (Inan & Lowther, 2010).

Another recent study was conducted on a Montessori school that was similar to Inan and Lowther’s. Jones interviewed and observed four teachers who had different years of teaching experience. Her study mentioned the years of experience the four teachers had, but also examined the teacher’s philosophy of teaching and how that affected the use of technology (Jones, 2017). Her conclusion to the study was that “regardless of teaching experience, all teachers reported feeling confident with technology” (Jones, 2017, p. 26).

The SAMR model is used in many schools because it categorizes the use of classroom technology for K-12 teachers (Hamilton, Rosenberg, & Akcaoglu, 2016). In this model, there are four levels. The levels help categorize how teachers select, use, and evaluate technology in education (Hamilton et al., 2016). Those that use this model say that it helps encourage teachers to move from a lower level to a higher level of teaching with technology (Hamilton et al., 2016). The four levels consist of substitution, augmentation, modification, and redefinition. If a teacher was using technology as a substitution, the task could be completed without the use of technology (Kirkland, 2014). An example of this is instead of a written test, the teacher would create a digital test for the students to take (Hamilton et al., 2016). If the teacher uses technology to change the way the task is completed in a positive way, then it would be considered augmentation (Hamilton et al., 2016). An example of this is to incorporate hand-held devices to listen to stories instead of a teacher-led read-aloud lesson (Hamilton et al., 2016). Modification takes a task and alters it in a way that it could not be completed without the use of technology (Hilton, 2016). An example of modification is using a simulation to help explain a concept that the teacher is describing (Hamilton et al., 2016). Redefinition is creating a completely new task using technology (Hilton, 2016). An example of redefinition is to assign students to create a video that represents an argument instead of writing an essay (Hamilton et al., 2016).

Gaps

Since 1994, there have been studies (Gray, Thomas, Lewis, & Tice, 2010) on how many computers there are in a classroom and how many of those are being used regularly. Researchers wondered if this would help explain the lack of technology use. It is imperative that we learn why technology is not being used. Recently, researchers have started to ask the question,

“Why?” Questions have been asked such as, “are we not properly training teachers, are attitudes or beliefs hindering use, or is there no support from administration?”

The Technology Acceptance Model (TAM) was first created in 1985. This model helps determine why some people accept technology and others do not. Teo (2016) concluded that the “intention to use technology is more directly influenced by the individual’s perception of its usefulness, even if people didn’t have a positive attitude toward using the technology” (p. 60). The critics of the TAM say that it is too simple and has a finite number of answers the person can choose from (Siegel et al., 2017).

The Commitment and Necessary Effort (CANE) model was created in 1998. This model says that emotions play a “key role in blocking acceptance of information technology” (Clark, 1998). A person can feel that they can use the new technology and believe that it is useful, but if they dislike it, they may reject it (Siegel et al., 2017). The questions that a person has to ask should be, “Do I get anything out of this?” and “Is this worth my while?” If the person feels that it will be valuable to them, then they may be motivated to use it and accept it (Siegel et al., 2017).

Summary

When people gain new knowledge, they still have the ability to decide to accept it as being true or false. Teachers are also given specific knowledge about technology. They have the choice to decide if that technology should be included as an effective tool in their classroom (Ertmer, 2005).

If there is a need for change, it has to start with changing beliefs. For this to happen, a person has to be unhappy about their existing beliefs. This happens when their existing beliefs are challenged, or a new belief cannot be incorporated in an existing idea. Ertmer (2005)

explains that to change a person's beliefs about technology, there are three strategies to do to change: 1) personal experience, 2) vicarious experiences, or 3) social-cultural influences. If the teacher does not believe that it will be beneficial, then being able to give knowledge to teachers is not going to be as influential (Ertmer, 2005). Pajares (1992) says, "All teachers hold beliefs, however defined and labeled, about their work, their students, their subject matter, and their roles and responsibilities...because humans have beliefs about everything" (p. 315).

Chapter III: Methodology and Design

Introduction

The problem stated in Chapter 2 discussed why there is technology resistance and how we can change to make sure that it is not happening in our schools. The first product that was created for this portfolio included a survey to gather data about the teachers in the district. This data helped create the other two projects. A table that lines up Minnesota Standards and ISTE Standards and a Schoology classroom where teachers can access resources was created to help with barriers in technology resistance. The information was presented to the technology integrationist, so he/she could use the data and resources to help the staff. The data and survey will help technology integrationists in the future figure out what the barriers are in each school district.

Target Audience

The target audience for all of the products in this portfolio will be the teachers in the Montevideo School District. For the 2018-2019 school year, there are currently about 170 teaching employees in the district. All the products created are optional for the teachers to use and fill out. The teachers may have been motivated to fill out the survey to help give input to the administration about what they would like to see happen with technology in the district and be excited to have resources that will help them with incorporating technology into their classrooms. The grades taught range from Pre-K to 12th grade teachers.

Throughout the process of creating the products, no personal information was collected from the audience. The survey was only to be used to help administration with finding the barriers that lead to technology resistance.

Description of Products

Product one. The first product that was created was a survey about how teachers are using technology, why they resist technology, what could help them successfully use technology in their classrooms and naming the barriers that are hindering their integration of technology. Using this data, the technology integrationist created new products that will help with integrating technology, which could then help the technology integrationists do their job proficiently.

Goals and objectives. The goal for this product was to collect data to help administration with technology resistance. If technology integrationists can understand what the barriers are and why some teachers are using technology and others are not, they will be able to have a better understanding to help reach the district's goals. Technology is constantly changing and there is a need for teachers to be up-to-date and have an innovative mindset.

Media used. The media used in this product was a Google Form. It was created in Google Forms and sent out to the teachers via email. The technology integrationist was required to get permission from the principal and the curriculum director in their district.

Methodology for analysis and evaluation. This product was an analysis of teachers in the districts. The survey examined how often teachers are using technology in their classrooms and what the barriers are for them not doing so. The information was collected and given to the technology integrationist to show the administration. The technology integrationist will then be able to use the data to help reach those teachers and break the barriers. The data also influenced how the other two projects in the portfolio changed.

To evaluate this product, the technology integrationist looked at the usability for the teachers. She did not want it to be too difficult and timely for them to complete or there would not have been as many volunteers to complete the survey. A small group of teachers examined

the survey and evaluated it before it was sent out to the district. Modifications were made after receiving feedback.

Context for implementation. The implementation of this product first consisted of creating the content and sending it to a small group of teachers to evaluate the survey. After receiving feedback, modifications were made. Then, the technology integrationist had to get permission from the principals of each school building along with the curriculum director. After getting permission to send out the survey, it was sent as a mass email to all teachers in the district explaining that it was a voluntary survey. An explanation of how the data collected from the survey will be helpful to the technology integrationist when creating staff developments was included.

Product two. The second product is a table that will help teachers line up all the K-12 Minnesota Standards with the ISTE Standards. This table explains what skills or knowledge the students should know to accomplish this standard and give examples of how the teachers are able to cover the standard using technology. If teachers are resisting technology, this will be a place where they will be able to come to get resources to cover not only the Minnesota Standards that they are required to teach but also include technology. The technology integrationist will introduce these to the teachers at the beginning of the year and then go over them in more depth in smaller groups if they have questions throughout the year.

Goals and objectives. The goal of creating this table was to have an easy resource that provides examples of how teachers can incorporate technology and cover the required standards. Teachers should have a clear understanding of how the Minnesota Standards can help cover ISTE Standards by using technology. There are different tables for each age group.

Media used. Since the school is a Google school, the resource was created using Google Docs. The technology integrationist showed the Google Docs on a smartboard and explained the different parts of the table. Then an explanation of where they can find the resources to accomplish each standard followed. The tables were sent electronically to each staff member for their age group, and they had the opportunity to save them in their Google Drive.

Methodology for analysis and evaluation. An evaluation of this product was conducted prior to showing the product to the teachers in our district. The technology integrationist got ideas of what she would like to see in the documents by conferring with other technology integrationists in the area. Then using the input, a document was created for grade alike groups. When completed, the technology integrationist had the sample group of teachers evaluate the products. If there was a need for modifications, those were completed.

Context for implementation. The implementation of this project consisted of small group discussions with teachers in each grade level to go over the documents. It was created for the district, but the technology integrationist used them in his/her staff development trainings.

Product three. The final product is a Schoology classroom that houses all the important documents that the teachers in the district use for everyday purposes, grading during the year, smartboard resources, technology resources, and how to use the 3D printer and poster printer. Having these resources in an easy to use place helps encourage the teachers to use technology. From the research gathered, one of the reasons teachers resist technology is because they do not like to feel inferior in their skill level. This product helps compensate for this by being in one area that the teachers are able to go repeatedly without having to ask questions. How to use Schoology and where to find necessary documents was explained in small groups throughout the school year.

Goals and objectives. The goal of this product was to have a place where teachers are able to go to find resources without having to ask someone how they can incorporate technology into their lessons. Teachers do not always have the time to search and ask for advice. This is a tool to help with that. The teachers were added to the Schoology classroom to gain the information.

Media used. For this product, Schoology is the platform. Folders were created for each technology that the district uses, so the teachers have quick access to important information. These folders included JMC, GoGuardian, Teachboost, Google Classroom, AESOP/Skyward, and Google Apps, and any other important information. A folder for technology resources, smartboard tips and tricks, the ISTE Standard documents were also created. Most of the folders included links that go to videos or explanations of how to use the technology.

Methodology for analysis and evaluation. A usability evaluation happened prior to sending the link to the teachers in the district. The technology integrationist asked the small group of teachers to investigate if it was too difficult or if modifications needed to be done.

Context for implementation. The implementation of this product consisted of creating the Schoology classroom and then inviting the teachers to join the classroom. This allowed the teachers to access the class at home or any mobile device. Schoology is a LMS (learning management system) so it was explained how to use it before sending it out. There was a Google Doc that explained how to login and use Schoology with the link.

Institutional review board approval. The technology integrationist completed the IRB training for graduate students on May 22, 2018. For all these products, all of the data that was collected was anonymous. There was no risk for the teachers, so there was no need to get approval from the Institutional Review Board.

Application of products. All of the products created in this portfolio were created to help administration with the problem of technology resistance among teachers. When creating the final product, the technology integrationist used the research from Chapters I and II to develop a survey to give the teachers in the district. The products created helped teachers have the resources in a place they can access anytime, an organized table that shows how they can cover a Minnesota Standard and incorporate technology using an ISTE Standard and collect data from the survey to continue to help the teachers, so there will be less technology resistance in the district.

Timeline

September 2018

- Meet with advisor to discuss the first three chapters of portfolio

October 2018

- Form a graduate committee

November 2018

- Official proposal meeting with graduate committee members

December-February 2018-2019

- Project production and completion

March 2019

- Final meeting with graduate committee members

April 2019

- Oral and written exit interview with the Information Media department
- Submit portfolio to ETD Institutional Repository

May 2019

- Graduation

Summary

The three products in Chapter III will help a technology integrationist do his/her job proficiently. Having the data to know how teachers are currently using technology, why they resist technology, what can help them successfully use technology in their classrooms and naming the barriers that are hindering their integration of technology helped the technology integrationist develop staff developments that are what the teachers needed.

Chapter IV will showcase the created products and evaluations from each. It will also describe how they can be used in the future.

Chapter IV: Project Showcase

Introduction

As described in chapter three, chapter four showcases the three projects that were created for this portfolio and to help administration understand what the barriers are that make teachers resist using technology in their classrooms. The first project is a survey that was sent out to teachers in a school district. The results from the survey helped shape the next two projects. The second project is a table that aligns the MN Standards and ISTE Standards. This table was created so teachers had the opportunity to have a tool that aligned the standards and give them examples of how they could incorporate technology into their lesson plans. The final project is a Schoology classroom. The classroom consists of all the technology a teacher would need to use throughout the school year in that school district. It also has technology tools and videos and links to explain how to use each. The final versions are represented in this chapter.

Product 1—Survey

Description. Product one was created using Google Forms. After agreeing to the authorization, the teacher answers four general multiple-choice questions. After pressing next, the teacher is brought to a multiple-choice question that will bring them to the section that corresponds with the answer to that question depending on how they answered it. There is a total of three other sections to which the teacher can be brought to. All questions are either multiple choice or checklist.

Audience analysis. The teachers in the district are very familiar with filling out Google Forms. Each one went into their school email account and decided if they wanted to volunteer their time to take the survey that was in their email. This survey went out to the 168 teachers in the district.

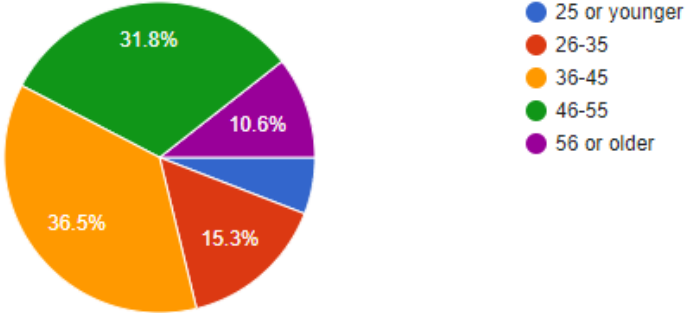
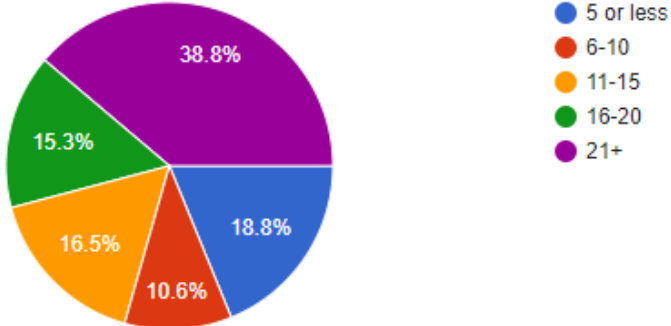
The teachers are vastly different in ages ranging from right out of college to close to retirement. The number of years they have been teaching range from first year to 21+ years. The familiarity with using technology ranges from those who use it for management purposes such as email and attendance to those who innovate using technology.

Learning context. A short introduction explained that this was voluntary and anonymous. It explained that the survey should only take a couple minutes, data will be shared with the technology integrationist, and the data will be used to help create staff development.

Needs analysis. The purpose of this survey is to learn if teachers are using technology as a learning tool, how they are currently using technology, and the barriers that are preventing them from not using it as a learning tool. Even though teachers have been encouraged to use technology as a learning tool, many are not. Learning what the barriers are for teachers will help with creating staff development.

Treatment/control. The survey for this product is a Google Form. There were questions that all teachers answered and a question that depending on how the teacher answered it would bring them to another set of questions. The teacher will have control over how they answer the one question that leads them to the set of questions that correspond with their answer given. It is a short survey, so they should be able to complete it in a few minutes. All questions are either multiple choice or checkbox.

Findings and discussion. These are the results from the survey. Fifty-one percent of the teachers responded to the survey.

| <p>What age range do you fall into?</p> | <p>What age range do you fall into?</p> <p>85 responses</p>  <table border="1"><thead><tr><th>Age Range</th><th>Percentage</th></tr></thead><tbody><tr><td>25 or younger</td><td>10.6%</td></tr><tr><td>26-35</td><td>15.3%</td></tr><tr><td>36-45</td><td>36.5%</td></tr><tr><td>46-55</td><td>31.8%</td></tr><tr><td>56 or older</td><td>10.6%</td></tr></tbody></table> | Age Range | Percentage | 25 or younger | 10.6% | 26-35 | 15.3% | 36-45 | 36.5% | 46-55 | 31.8% | 56 or older | 10.6% |
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|---|---|------------------|------------|--|-------|---|-------|---|-------|---|-------|-------------------------------------|------|
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| I don't use technology in my class. | 9.4% | | | | | | | | | | | | |

| <p>How often do you use technology in the classroom for a learning tool other than for management (i.e. attendance)?</p> | <p>How often do you use technology in the classroom for a learning tool other than for management (i.e. attendance)?</p> <p>85 responses</p> <table border="1"> <caption>Frequency of Technology Use for Learning Tools</caption> <thead> <tr> <th>Frequency</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>everyday</td> <td>58.8%</td> </tr> <tr> <td>2-3 times a week</td> <td>15.3%</td> </tr> <tr> <td>weekly</td> <td>9.4%</td> </tr> <tr> <td>rarely</td> <td>16.5%</td> </tr> <tr> <td>never</td> <td>0%</td> </tr> </tbody> </table> | Frequency | Percentage | everyday | 58.8% | 2-3 times a week | 15.3% | weekly | 9.4% | rarely | 16.5% | never | 0% | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|-----------|------------|------------|-------|-----------------------|-------|----------------|------|----------------------------------|-------|----------------------------|----|--------------------------|----|---------------------------------|----|--------------------------|----|-----------------|----|---------------------------------|----|-------------------|----|------------------|----|---------|----|-------------------------------------|----|------------|----|------------|----|-----------------------|----|------------------|----|---------------|----|
| Frequency | Percentage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <p>How do you currently use technology as a learning tool in your classroom? Choose all that apply.</p> | <p>How do you currently use technology as a learning tool in your classroom? Choose all that apply.</p> <table border="1"> <caption>Current Uses of Technology in the Classroom</caption> <thead> <tr> <th>Use</th> <th>Count</th> </tr> </thead> <tbody> <tr> <td>Attendance</td> <td>63</td> </tr> <tr> <td>Creating Lesson Plans</td> <td>50</td> </tr> <tr> <td>Showing Videos</td> <td>29</td> </tr> <tr> <td>Gathering Feedback from Students</td> <td>48</td> </tr> <tr> <td>Having Student Create Work</td> <td>37</td> </tr> <tr> <td>Collaboration Activities</td> <td>68</td> </tr> <tr> <td>Emailing Staff/Parents/Students</td> <td>57</td> </tr> <tr> <td>Powerpoint/Google Slides</td> <td>67</td> </tr> <tr> <td>Google Searches</td> <td>23</td> </tr> <tr> <td>Simulations/Virtual Field Trips</td> <td>34</td> </tr> <tr> <td>Online Worksheets</td> <td>41</td> </tr> <tr> <td>Lessons Practice</td> <td>57</td> </tr> <tr> <td>Grading</td> <td>49</td> </tr> <tr> <td>Interactive with Smartboard Lessons</td> <td>61</td> </tr> <tr> <td>e-textbook</td> <td>23</td> </tr> <tr> <td>Light Room</td> <td>49</td> </tr> <tr> <td>Due Process Paperwork</td> <td>34</td> </tr> <tr> <td>Google Classroom</td> <td>23</td> </tr> <tr> <td>Playing Music</td> <td>41</td> </tr> </tbody> </table> | Use | Count | Attendance | 63 | Creating Lesson Plans | 50 | Showing Videos | 29 | Gathering Feedback from Students | 48 | Having Student Create Work | 37 | Collaboration Activities | 68 | Emailing Staff/Parents/Students | 57 | Powerpoint/Google Slides | 67 | Google Searches | 23 | Simulations/Virtual Field Trips | 34 | Online Worksheets | 41 | Lessons Practice | 57 | Grading | 49 | Interactive with Smartboard Lessons | 61 | e-textbook | 23 | Light Room | 49 | Due Process Paperwork | 34 | Google Classroom | 23 | Playing Music | 41 |
| Use | Count | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Playing Music | 41 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| <p>What are the top 3 barriers for you not using technology every day? Choose all that apply.</p> | <p>What are the top 3 barriers for you not using technology everyday? Choose all that apply.</p> <ul style="list-style-type: none"> Not comfortable using it Don't see the need or benefit for it Don't have the necessary skills to do what is proposed Don't have prep time to practice it Fear of looking stupid in front of tech-savvy students Lack of professional development training Not enough technical support for troubleshooting problems Not enough freedom with curriculum Other <table border="1"> <caption>Barriers to Using Technology Everyday</caption> <thead> <tr> <th>Barrier</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Don't have prep time to practice it</td> <td>17</td> </tr> <tr> <td>Not comfortable using it</td> <td>10</td> </tr> <tr> <td>Don't see the need or benefit for it</td> <td>7</td> </tr> <tr> <td>Don't have the necessary skills to do what is proposed</td> <td>6</td> </tr> <tr> <td>Other</td> <td>8</td> </tr> <tr> <td>Fear of looking stupid in front of tech-savvy students</td> <td>4</td> </tr> <tr> <td>Lack of professional development training</td> <td>4</td> </tr> <tr> <td>Not enough technical support for troubleshooting problems</td> <td>4</td> </tr> <tr> <td>Not enough freedom with curriculum</td> <td>3</td> </tr> </tbody> </table> | Barrier | Percentage | Don't have prep time to practice it | 17 | Not comfortable using it | 10 | Don't see the need or benefit for it | 7 | Don't have the necessary skills to do what is proposed | 6 | Other | 8 | Fear of looking stupid in front of tech-savvy students | 4 | Lack of professional development training | 4 | Not enough technical support for troubleshooting problems | 4 | Not enough freedom with curriculum | 3 |
|---|--|---------|------------|-------------------------------------|----|------------------------------|----|--------------------------------------|----|---|---|-------|---|--|---|---|---|---|---|------------------------------------|---|
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| Don't have prep time to practice it | 17 | | | | | | | | | | | | | | | | | | | | |
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| Lack of professional development training | 4 | | | | | | | | | | | | | | | | | | | | |
| Not enough technical support for troubleshooting problems | 4 | | | | | | | | | | | | | | | | | | | | |
| Not enough freedom with curriculum | 3 | | | | | | | | | | | | | | | | | | | | |
| <p>What can help you successfully use technology more in your classroom? Choose all that apply.</p> | <p>What can help you successfully use technology more in your classroom? Choose all that apply</p> <ul style="list-style-type: none"> Time Examples of technology tools Small groups More training on how to use chromebooks Examples of lesson plans for subject that include standards Easy-to-use resources on hand Other <table border="1"> <caption>Factors Helping to Use Technology More in Classroom</caption> <thead> <tr> <th>Factor</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Time</td> <td>21</td> </tr> <tr> <td>Examples of technology tools</td> <td>12</td> </tr> <tr> <td>Easy-to-use resources on hand</td> <td>21</td> </tr> <tr> <td>Examples of lesson plans for subject that include standards</td> <td>9</td> </tr> <tr> <td>Other</td> <td>4</td> </tr> <tr> <td>More training on how to use chromebooks</td> <td>6</td> </tr> <tr> <td>Small groups</td> <td>0</td> </tr> </tbody> </table> | Factor | Percentage | Time | 21 | Examples of technology tools | 12 | Easy-to-use resources on hand | 21 | Examples of lesson plans for subject that include standards | 9 | Other | 4 | More training on how to use chromebooks | 6 | Small groups | 0 | | | | |
| Factor | Percentage | | | | | | | | | | | | | | | | | | | | |
| Time | 21 | | | | | | | | | | | | | | | | | | | | |
| Examples of technology tools | 12 | | | | | | | | | | | | | | | | | | | | |
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| Examples of lesson plans for subject that include standards | 9 | | | | | | | | | | | | | | | | | | | | |
| Other | 4 | | | | | | | | | | | | | | | | | | | | |
| More training on how to use chromebooks | 6 | | | | | | | | | | | | | | | | | | | | |
| Small groups | 0 | | | | | | | | | | | | | | | | | | | | |

According to the data, on average, the teachers in the district are using technology for more than management purposes. How the teachers are using technology as a learning tool comes in many forms. Students are given the opportunity to experience using technology in our district whether it be from simulations, collaborating, Google searching, etc. This benefits students to learn from different technology uses. They become more engaged in the learning.

Using data from the question, “What barriers are preventing you from using technology as a learning tool,” administration can see what they need to do to help the teachers if they want this problem fixed in our district. The data shows that the number one answer to that question is prep time. Hopefully the administration will look at that and help teachers with finding time to learn how to use technology as a learning tool.

The data show that teachers are looking for easy-to-use resources on hand and having time to work on technology would help them use technology more in their classroom. The following two products have been created to be easy-to-use resources that they can go to if they need ideas on how to use technology in their classrooms. Again, administration has to look at providing teachers with more time to work on technology if they want this to improve in the district.

After looking at the results of the survey, one may wonder if more teachers volunteered to complete the survey if they felt more comfortable with using technology or those who taught from a certain age group. There were 36 teachers who responded who teach 9-12th grade, 24 teachers who responded teach K-3rd grade, 17 teachers who responded teach 6-8th grade, and nine teachers who responded teach 4-5th grade. Currently, the district is 1:1 with Chromebooks in grades 6-12th grade, carts are in each room in 4-5th grade, and carts available for grades K-3rd

grade. From this data, it is surprising that the second largest group of teachers who responded to the survey use technology every day is from K-3rd grade.

The results did indicate that most of the teachers who responded to the survey use technology every day. Fifty-eight percent of the 9-12th grade teachers who responded said they use technology every day in their classrooms. Seventy-five percent of the K-3rd grade teachers who responded said they use technology every day. The results from the teachers who responded that teach grades 4-5th grade and 6-8th grade were spread out more evenly among the four possible answers they could choose from. The middle school at our district consists of grades 4-8th grade. A person may conclude that the problem could be a building issue instead of a grade issue.

Link. Click on the link [here](#) to get to the original Google Form survey or it is in Appendix B. The informed consent form for the survey is Appendix A.

This product was dispersed via email to each school in the school district. It was stated that it was voluntary, anonymous, would only take a couple minutes, and the data will be used to help the technology integrationist from the district create staff development.

Product 2—MN/ISTE Standard Table

Description. Product two is a table that lines up the MN Standards and the ISTE Standards. There are four columns in each document. Each document corresponds to a school building in the district. The first column lists the ISTE Standards. The second column lines up any MN Standard that the teacher can complete by completing the ISTE Standard. The third column lists the knowledge or skills that students should know how to do to complete the category. The final column lists activities or sites that teachers can use to meet the standards.

Audience analysis. The goal of the district's technology integrationist is to have the teachers meet in small groups and go over the table that they would use in the classes they teach. There will be no prior knowledge of these tables. In small groups, there will be an explanation on how incorporating the ISTE Standards can cover some MN Standards that are required to complete.

Some teachers will understand the benefits of the table while others will need more of an explanation on how they can use it. There is a wide range of familiarity with technology and their comfort level using it. Not all teachers will be motivated to use this table. It may require some to put in more work to incorporate technology as a learning tool.

Learning context. The small group sessions to go over the tables will introduce how the table can be a resource to help those teachers incorporate technology as a learning tool. The examples and sites in the final column are beneficial tools. Teachers will spend a morning or afternoon working with the technology integrationist. The group will go over the table and then talk about specific technology tools that each teacher could incorporate to cover a MN Standard. Allowing teachers' time to work on this will cover the "time" need indicated on the survey.

Needs analysis. Knowing what skills, the students should know how to do to cover the category and having resources available of how to cover the category, should help the teachers who marked on the survey that they wanted "easy-to-use" resources on hand. Being able to meet in small groups during school hours should help those who marked on the survey that they needed more "time" to work on technology. The survey results also indicated that teachers needed "examples of technology tools." On this table, the last column covers this need.

Treatment/control. The table for this product will be created using Google Docs. After getting the survey results with teacher's barriers to using technology as a learning tool, the

technology integrationist can pick out those needs that were repeated. It will be the teacher's responsibility as to how open they are to the suggestions and the tools that will be presented to them. Creating this table, forming small groups, and doing this training in a morning or afternoon will cover three of the most prominent needs on the survey results.

Findings and discussion. To see the original tables, click on the links below. Appendix C shows an example of what the tables look like (K-3 ISTE Standard table). In the following paragraphs, the table is explained using examples from the 4-5 Grade ISTE Standard table.

The table lines up any ISTE Standards with MN Standards, so a teacher has a resource that they can use to find lesson plans that incorporate technology while still covering the MN Standard. An example of this is taking the ISTE Standard about digital citizenship and lining up the MN Standard in grades four and five, which states that students should be able to "recognize safe practices in social and personal media communications."

The third column on the table lists the knowledge and skills that students should know how to do to complete this standard using technology. These skills come from the ISTE Standard checklist. The skills are marked with an I, W, or M. This indicates that the students have been introduced, are working on, or have mastered this skill. An example of this would look like this:
Understand how to be safe online and in a digital world. W.

The final column activities or sites that a teacher could use to cover the standards. Two sites listed under digital citizenship that have created lesson plans are commonsense.org and netsmartz.org. Other than sites listed, there are examples of projects that students could create that would use technology. An example of this would be: students can create posters to go around school warning students that everything they do online is never erasable.

After the tables have been explained to teachers, the teachers are able to go back to this resource. The technology integrationist can update and add more resources if he/she finds any new ones or if teachers have resources that are valuable to them. When planning to cover a MN Standard, the teacher find that standard on the table, see what skills and knowledge the students should know, what they have been introduced to, and skills they may have learned but have not mastered yet. Then using this information, he/she can look at activities and sites that can help them create lesson plans that use technology to cover the MN Standard.

Link. All of the Google Doc tables are similar in the way they look. To look at all the tables, click on the links provided: [K-3 ISTE Standards](#) [Grades 4-5 ISTE Standards](#) [Grades 6-8 ISTE Standards](#) [Grades 9-12 ISTE Standards](#)

Product 3—Schoology Classroom

Description. The third product was created in the LMS, Schoology. It is an online resource that contains all the technology information from the district in one place. This includes links and videos on how the district does grading, how to take attendance, how to create absences, and examples of technology tools that could be implemented. According to the survey results, teachers in the district are looking for easy-to-use resources, examples of resources, and time. This product does the first two.

Audience analysis. This product was created for the teachers in this district. It was created in Schoology. Since this district is a Google school, there are only a few teachers who use Schoology in their classrooms. How to use this LMS will have to be implemented before sharing this with the teachers.

Learning context. The technology integrationist will form small groups of teachers to go over how to use Schoology and to explain how this resource can help them. After discussing how

it will benefit the teacher, the technology integrationist will give time for the teachers to look over the links and videos and answer any questions. In these small groups, the teachers will have “time” to look at resources. Allowing the teachers to have time to look at the site will encourage more teachers to use this resource.

Needs analysis. The purpose of this resource is to have one place where teachers are able to go to find numerous resources that they will need. New teachers coming into the district have mentioned that they did not know where to find information on how to use certain technology. Instead of having to ask, teacher will have the opportunity to look at the LMS and find what they are looking for through links and videos. The product 2, ISTE Standards, are included in this LMS as a resource. Since this is online, teachers are able to access this from anywhere. The teachers will benefit from this because it is all in one place.

Treatment/control. Even though the technology integrationist will go over how to use Schoology and show the teachers how the LMS will be a beneficial resource, some teachers may not be interested in it. The teacher will have control over how they use the resource in the future.

Findings and discussion. The teachers learn how to use Schoology first if they have never used it before. Then, the technology integrationist would explain how to use and find the links and resources on each page. Appendix D will highlight more examples.

This is what the main page looks like in the Schoology Teacher's Resource page.

The screenshot shows the Schoology interface for a course titled "Teacher Technology: Teacher Technology". The top navigation bar includes "UPGRADE", "COURSES", "GROUPS", and "RESOURCES". On the left, there is a sidebar with "Materials" selected, showing options like "Updates", "Gradebook", "Grade Setup", "Badges", "Attendance", and "Members". Below this is an "Access Code" box with the code "2F8GM-GB38R" and a "Reset" button. The main content area displays a list of materials under the "JMC" folder, including "GoGuardian", "TeachBoost", "Google Classroom", "Skyward/AESOP", "Google Apps", "Technology Resources", "Smartboard Tips and Tricks", "ISTE Standard Documents", and "Printers-3D, Poster". On the right, there is an "Upcoming" section with a calendar icon and the text "No upcoming assignments or events".

If a teacher would like to learn more about GoGuardian, they would click on the folder. Inside this folder, there is an explanation of what it is, a link to a training video, and a link to get to the GoGuardian site.

This screenshot shows the Schoology interface with the "GoGuardian" folder selected. The top navigation bar is the same as in the previous screenshot. The sidebar on the left is also the same. The main content area now displays the details for the "GoGuardian" folder. It includes a "What is GoGuardian?" section with a brief description: "GoGuardian is an online site that is used to help manage the devices our students are on in the classroom. The teacher is able to see what sites each student is on and can lock them into certain...". Below this, there are two links: "Training Video (30 mins)(Click here)" and "Link (Click here)". The right sidebar is partially visible, showing "Prev" and "Next" navigation buttons.

Summary

Looking at the data that resulted from the survey in product one, products two and three meet those needs that teachers were asking for to successfully use technology in their classroom. The top three answers to the question, “What can help you successfully use technology more in your classroom?” were time, easy-to-use resources, and examples of technology tools. These resources will help teachers have easy-to-use resources and are examples of technology tools. The administration will have to decide to allow more time if they see that it is necessary. The results have been shared with them.

Chapter V: Reflection

Introduction

The final chapter, Chapter V, will be a reflection on each product and overall reflection to the theme of the portfolio. The previous chapter described that product one, the survey, was created and from the data of that survey, products two and three were created. The data provided me with the district's top three barriers that keep them from using technology as a learning tool in their classroom and what the teachers need to successfully incorporate technology in their classroom.

When I was completing my internship hours and working with the technology integrationist from our district, I became very interested in trying to figure out what the barriers are that prevent people from using technology as a learning tool in their classroom. We had many discussions about this topic the first few weeks of the internship. We discussed what makes a teacher use technology and what the barriers were that prevented them from using technology as a learning tool.

When deciding what I should do to complete my internship hours, the technology integrationist asked me to help her create the ISTE Standard tables (product two). She has been working for our district for three years and has found that the teachers that did not integrate technology were mostly those that did not have technology resources that they had been introduced to. She decided that she wanted a table that was easy-to-read and utilize for the teachers in the district.

Also, during my internship hours, the technology integrationist recommended that I create the Schoology classroom (product three), so that teachers could have an online resource that highlighted all the technology that is used in our district. Even though we are a Google

school, she suggested creating this using Schoology. If a teacher knows how to use Schoology, this is a great tool to have. The LMS is easy to update and very user friendly. It also included the ISTE Standard product. Even though Schoology is the LMS that she suggested, I believe our teachers would prefer using Google Drive or Google Classroom since we are a Google district.

The technology integrationist decided the best way to show the teachers about these two resources would be to form them into small groups. I agree with her. In the small groups, the teachers would be able to have the tables and Schoology explained to them, but also time to look over the documents and online LMS and ask questions. The survey results indicated that teachers want time to do use the technology after they are introduced to it.

Discussion of Products

Reflection of product 1 As mentioned previously, product one was created because of the discussions that the technology integrationist and I had trying to figure out what was preventing teachers from using technology as a learning tool in our district. Since this is her job, she encouraged me to create my portfolio about this topic. Seeing what her job tasks were and knowing that this is what I wanted to do after I graduated with my Master's, I decided this would be the best topic for me. I could use this same idea if I went to work at a different school or it could help other technology integrationists figure out their district's barriers.

The first five questions were general questions that gave me information about who was filling out the survey. It was interesting to look at the total number of years that teachers have been teaching in our district and see what teachers responded from each grade level. The next general question had to do with the SAMR model. My culminating project committee suggested adding this question to the survey. This model has four levels of how a person can integrate technology as a learning tool into their classrooms. Being able to see where you are and how you

can move up levels is an excellent source to increasing motivation to incorporate technology. The last general question asks how often the person uses technology as a learning tool in the classroom for things other than management. Depending on how the person answered the question, he/she was brought to different questions.

The data collected from the survey was not surprising to me. Looking at the SAMR model question, almost half of the teachers that responded are on the Augmentation level. These data show where many of our teachers are and what they need to do to improve on incorporating technology as a learning tool.

The data from the question that asks how often the teacher uses technology in their classroom resulted in 60% saying that they used it every day. Even though this statistic seems like it is really good, our district has added 1:1 Chromebooks in grades 6-12 and Chromebook carts in grades K-5. According to the survey, 62% of the teachers who took the survey are 6-12th grade teachers. This group of teachers have access to students who are 1:1 with Chromebooks. This is an area where our technology use should be higher because the technology is available.

Having the technology in our district has been very beneficial for our students, but it is challenging to our staff when they have not had enough time to learn the technology and how to incorporate it. The top three barriers preventing the teachers in our district from using technology as a learning tool were not enough prep time, not comfortable using it, and other.

Even though I wanted to figure out what the barriers are in our district, learning what could help them successfully incorporate technology as a learning tool is a more significant question. The top three answers to this were time, easy-to-use resources on hand, and examples of technology tools. From the results of this question, the next two products serve as both resources and examples.

Reflection of product 2 Product two was created while I was completing my internship hours. In the previous year, a group of technology teachers in our district met and created a scope and sequence for technology use. It included what the students should know how to do using technology and by what grade. From this scope and sequence, product two was formed. The district's technology integrationist decided that she wanted me to help her create this table that lined up the ISTE Standards with the MN Standards. We picked out the MN Standards that included technology and lined up the ISTE Standard that corresponded with it.

The scope and sequence checkpoints were added in the table in the column under the knowledge/skills that students should know how to do to complete this standard. The checkpoints are marked introduced, working on, or mastered. This is where the student's skill level comes from. The last column lists the sites and activities that the teachers could use to help them cover the MN Standard and add technology in their lesson plans. This list of sites/activities are examples of technology tools and easy-to-use resources.

The tables were sent via email to a group of teachers in our district. The group of teacher's feedbacks said that this would be a good resource that they could use in their classrooms. They liked that there were lesson plans and activity suggestions that they could look at to integrate technology. Since I sent it via email and gave a brief description of what it was and how they could use it, the only complaint was that at first it was difficult to read the table. This comment reiterated the need to show the teachers what it was, how they could use it, and how they could add to it for future teachers.

Reflection of product 3 Product 3 is a Schoology classroom. This has all the technology resources that our district uses all together in one place. The resources range from our grading tools to technology tools that teachers in our district use. To help create this resource, I surveyed

the teachers who were hired in our district within the past three years. I asked them what they suggested would be beneficial for new teachers coming into our district to know about technology and what technology tools they currently use that would benefit new teachers. I added their responses into the classroom.

This resource will be useful for teachers in the future. It is an easy-to-use resource on hand and has examples of technology tools. Instead of looking in many different areas or asking questions, teachers are able to go to one place to look for all the resources they would use in our district.

To gather feedback about the Schoology classroom before introducing it to our district, I sent the link via email to a small group of teachers. One teacher offered a suggestion on setting up the links, so the person can go directly to the material in a new tab. This suggestion makes it more user friendly since the person would only have to click once instead of twice to get to the material. I changed all the links so that they were one click and opened a new tab. Another comment suggested that Schoology makes it easy to add files and change, but since we are a Google district, why not create it in our district's Team Drive. Teachers will be more apt to use the resource if they are more familiar with it.

Not only did I have teachers in my small group from the high school, middle school, elementary, and kindergarten building, I added a couple teachers from the alternative school. Two suggestions needed to be changed/added according to the feedback. The suggestions were to add how they use JMC for grading purposes and discipline. The district does not allow them to use the 3D printer and poster printer at the school, so I deleted that link on how to print.

Reflection of portfolio I talked to our technology integrationist after getting the survey results back from the teachers. She had planned on meeting with small groups at the beginning of

the school year and introducing products two and three. After talking to the principals in each school, they decided that she should review the scope and sequence first with teachers, then introduce the ISTE Standard tables and Schoology classroom. Doing this would help the teachers make sense of the tables more quickly.

The technology integrationist has just started making plans to meet with the small groups this year. Her goal is to make sure teachers are aware of the ISTE Standards. The plan is to share the ISTE Standard tables and Schoology classroom next year in small groups.

Limitations

The results from the survey indicated that teachers are wanting more time to practice and use technology for their classrooms. Time may not be available for teachers or it just may not be used by teachers. Our district offers in school time to work on technology with the technology integrationist, but few teachers take advantage of it. So even though teachers are wanting more time, the offering may be there, but they are choosing not to use it. This is something that other districts can learn from our experience. Maybe teachers need to be required to use the technology time for them to actually use it. This is a time management issue that needs to be fixed for professional developments.

Recommendation of Application

Since I am not the technology integrationist for the district, I cannot use my findings to better the district. Instead, I will pass along the data to the technology integrationist and then she will be able to present the data to the district. Even though I am not able to use the data currently, I know that in the future, it will be beneficial to my career.

I suggest other schools use the survey to learn more about their district's needs as far as technology goes. Having a ready-to-use survey that only takes a couple minutes for teachers to

fill out will benefit any district. Not only finding out what barriers each district has but looking at the data and seeing what teachers need to successfully integrate technology into their classrooms as a learning tool.

Recommendation of Future Products

I would recommend all districts use the survey created in product one. This can give the administration data that they need to learn what the barriers are and how they can help teachers successfully use technology as a learning tool in their classrooms. Technology is not going away; teachers need to learn to integrate it into their lesson plans so that students receive the best education. The data resulting from the survey can lead to creating new products that would be useful in each district.

I would recommend introducing these products at new teacher training or part of a mentorship program. Introducing them as soon as the new teachers come into the district will set the standard of expectations of how we use technology. It will also reiterate the importance of technology in the district.

Future Research

For those who want to continue with this research, it is recommended that the survey would be sent out to support staff and other certified specialists. Using the information gathered from those groups of staff would add to the overall technology use in the districts and conclude a broader sense of statistics for that district.

Conclusion and Significance

After getting the results back from the survey, I have a much better understanding of our district. The answers did not surprise me, but I was surprised by how many teachers volunteered their time to take the survey. Taking this data, the technology integrationist will be able to better

our district by creating staff development trainings that reflect on the needs of our teachers. The results will also show the administration data that teachers want and need more time to work on integrating technology in their lesson plans.

Working on this portfolio has benefited my teaching career. It gave me insight into our district and will give me tools to bring to help other districts understand what their barriers are. Soon I will be graduating and will find a job that involves technology integration, these tools will help me reach the teachers in the district and help them integrate technology as a learning tool.

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Appendix A: Informed Consent Letter

You are invited to participate in a survey conducted by Aimee Thalberg, under the supervision of Professor Kristen Carlson, to fulfill the requirements of the Masters in Information Media at St. Cloud State University. Your response is important because of your teaching experience at Montevideo Schools.

Title of the Study

Technology resistance: Helping administration stop it in our schools.

Purpose of the Study

The purpose of the study is to examine Montevideo School District and find out what causes technology resistance.

Study Specifics

The study will be using Google Forms, an online quiz and questionnaire tool. You will be asked to complete the questions of various types, including multiple choice, short answer, and checkbox. Completing the survey will take approximately 10 minutes or less.

Risks and Discomforts

The data from this survey will help create projects to help with technology resistance in our district. There is minimal risk in taking the survey for this study.

Benefits

Benefits from this study include helping the researcher and the district evaluate the current use and future use of technology.

Confidentiality

It is an anonymous survey. The confidentiality of the information gathered during your participation in this study will be maintained. Your personal identify will remain confidential. The results of the study will appear as 'group results.' All data will be stored in the Google Drive account of the researcher and deleted when the portfolio is completed. The Google account is protected by secure password.

Voluntary Participation/Withdrawal

Your participation in this study is voluntary. You may decide not to participate or to withdraw your consent to participate in this study at any time, for any reason, without penalty. Your decision whether or not to participate will not affect your current or future relations with the district or the researcher.

If you would like a copy of survey result, or have questions at any time about the study, you may contact:

The researcher advisor: Professor Kristen Carlson

Email: kmcarlson@stcloudstate.edu

The researcher: Aimee Thalberg, Graduate Student, Information Media Department

Email: ajthalberg@stcloudstate.edu

Appendix B: Product 1—Teacher Technology Use Survey

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| <p>All teachers answered these four general questions.</p> | <h2>Technology Use Survey</h2> <p><i>* Required</i></p> <h3>Authorization/Agreement *</h3> <p>By responding to this survey, you are confirming that you are at least 18 years old, and you also indicate that you understand the purpose and nature of this study. Your participation is voluntary, so you can withdraw at any stage of the project without incurring penalty or disadvantage in any way. By completing and submitting the survey, you are giving consent to participate in this study. Thank you for taking the time to participate in this study.</p> <p><input type="radio"/> Agree</p> <p><input type="radio"/> Disagree</p> <h3>What age range do you fall into? *</h3> <p><input type="radio"/> 25 or younger</p> <p><input type="radio"/> 26-35</p> <p><input type="radio"/> 36-45</p> <p><input type="radio"/> 46-55</p> <p><input type="radio"/> 56 or older</p> <h3>How many total years have you been teaching? *</h3> <p><input type="radio"/> 5 or less</p> <p><input type="radio"/> 6-10</p> <p><input type="radio"/> 11-15</p> <p><input type="radio"/> 16-20</p> <p><input type="radio"/> 21+</p> <h3>What grade level do you teach? *</h3> <p><input type="radio"/> K-3</p> <p><input type="radio"/> 4-5</p> <p><input type="radio"/> 6-8</p> <p><input type="radio"/> 9-12</p> |
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| | <p>What level on the SAMR model do you feel you fall most of the time when incorporating technology into your lesson plans?</p> <ul style="list-style-type: none"> <input type="radio"/> Substitution (online quiz or worksheet instead of a paper copy, using slideshows to present information) <input type="radio"/> Augmentation (videos, interactive links, debates on a topic, online assessment-Kahoot) <input type="radio"/> Modification (creating graphic organizers, students give feedback to each other, Nearpod, Flipgrid) <input type="radio"/> Redefinition (students give feedback to teachers or outside of school, collaboration, communicating, contacting outside sources) <input type="radio"/> I don't use technology in my class. <p style="text-align: center;">NEXT</p> |
| <p>All teachers answered this question but it took them to the section that corresponded with the answer that they chose.</p> | <h2 style="text-align: center;">Technology Use -2</h2> <hr/> <p>Description (optional)</p> <hr/> <p>How often do you use technology in the classroom for a learning activity rather than for management (i.e. attendance)?</p> <ul style="list-style-type: none"> <input type="radio"/> everyday <input type="radio"/> 2-3 times a week <input type="radio"/> weekly <input type="radio"/> rarely <input type="radio"/> never |

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| <p>If the teacher answered “every day,” they answered to section three, Technology Use-3.</p> | <h2 data-bbox="521 268 902 317">Technology Use-3</h2> <p data-bbox="521 369 699 390">Description (optional)</p> <p data-bbox="521 485 1352 552">How do you currently use technology as a learning tool in your class? Choose all that apply.</p> <ul style="list-style-type: none"><li data-bbox="521 590 659 611"><input type="checkbox"/> Attendance<li data-bbox="521 657 740 678"><input type="checkbox"/> Creating lesson plans<li data-bbox="521 724 691 745"><input type="checkbox"/> Showing videos<li data-bbox="521 791 841 812"><input type="checkbox"/> Gathering feedback from students<li data-bbox="521 858 797 879"><input type="checkbox"/> Having students create work<li data-bbox="521 926 751 947"><input type="checkbox"/> Collaboration activities<li data-bbox="521 993 824 1014"><input type="checkbox"/> Emailing staff/parents/students <li data-bbox="548 1077 824 1098"><input type="checkbox"/> Powerpoint/Google Slides<li data-bbox="548 1144 740 1165"><input type="checkbox"/> Google searches<li data-bbox="548 1224 862 1245"><input type="checkbox"/> Simulations/Virtual Field Trips<li data-bbox="548 1291 756 1312"><input type="checkbox"/> Online worksheets<li data-bbox="548 1371 732 1392"><input type="checkbox"/> Lesson practice<li data-bbox="548 1438 662 1459"><input type="checkbox"/> Grading<li data-bbox="548 1518 911 1539"><input type="checkbox"/> Interactive with smartboard lessons<li data-bbox="548 1585 651 1606"><input type="checkbox"/> Other... |
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| <p>If the teacher answered “2-3 times a week” or “weekly,” they answered to section four, Barriers-1.</p> | <h2>Barriers-1</h2> <p>Description (optional)</p> <p>How do you currently use technology as a learning tool in yo Choose all that apply.</p> <ul style="list-style-type: none"><input type="checkbox"/> Attendance<input type="checkbox"/> Creating lesson plans<input type="checkbox"/> Showing videos<input type="checkbox"/> Gathering feedback from students<input type="checkbox"/> Having students create work<input type="checkbox"/> Collaboration activities <input type="checkbox"/> Emailing staff/parents/students<input type="checkbox"/> Powerpoint/Google Slides<input type="checkbox"/> Google searches<input type="checkbox"/> Simulations/Virtual Field Trips<input type="checkbox"/> Online worksheets<input type="checkbox"/> Lesson practice<input type="checkbox"/> Grading<input type="checkbox"/> Interactive with smartboard lessons<input type="checkbox"/> Other... |
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| | <p>What are the top 3 barriers for you not using technology everyday that apply.</p> <ul style="list-style-type: none"><input type="checkbox"/> not comfortable using it<input type="checkbox"/> don't see the need or benefit for it<input type="checkbox"/> don't have the necessary skills to do what is proposed<input type="checkbox"/> don't have prep time to practice it<input type="checkbox"/> fear of looking stupid in front of tech-savvy students<input type="checkbox"/> lack of professional development training<input type="checkbox"/> not enough technical support for troubleshooting problems<input type="checkbox"/> not enough freedom with curriculum<input type="checkbox"/> other <p>What can help you successfully use technology more in the classroom? Choose all that apply.</p> <ul style="list-style-type: none"><input type="checkbox"/> Time<input type="checkbox"/> Examples of technology tools<input type="checkbox"/> Small groups<input type="checkbox"/> More training on how to use Chromebooks<input type="checkbox"/> Examples of lesson plans for subjects that include standards<input type="checkbox"/> Easy-to-use resources on hand<input type="checkbox"/> Other... |
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| <p>Finally, if the teacher answered “rarely” or “never,” they answered to section five, Barriers-2.</p> | <h2>Barriers-2</h2> <p>Description (optional)</p> <p>What are the top 3 barriers for you not using technology? Check all that apply.</p> <ul style="list-style-type: none"><input type="checkbox"/> not comfortable using it<input type="checkbox"/> don't see the need or benefit for it<input type="checkbox"/> don't have the necessary skills to do what is proposed<input type="checkbox"/> don't have prep time to practice it<input type="checkbox"/> fear of looking stupid in front of tech-savvy students<input type="checkbox"/> lack of professional development training |
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| | <p><input type="checkbox"/> not enough technical support for troubleshooting problems</p> <p><input type="checkbox"/> not enough freedom with curriculum</p> <p><input type="checkbox"/> other</p> <p style="text-align: center;">⋮</p> <p>What can help you successfully use technology more in your classroom? Choose all that apply.</p> <p><input type="checkbox"/> Time</p> <p><input type="checkbox"/> Examples of technology tools</p> <p><input type="checkbox"/> Small groups</p> <p><input type="checkbox"/> More training on how to use Chromebooks</p> <p><input type="checkbox"/> Examples of lesson plans for subjects that include standards</p> <p><input type="checkbox"/> Easy-to-use resources on hand</p> <p><input type="checkbox"/> Other...</p> |
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Appendix C: Product 2—Grades K-3 ISTE Standards (Grades 4-5, Grades 6-8, and Grades 9-12 look very similar)

Empower Learners

Students leverage technology to take an active role in choosing, achieving, and demonstrating competency in their learning goals, informed by the learning sciences.

| What the ISTE Standard says | What MN Standard(s) address this category? | Knowledge/Skills required to complete this category I-introduce, W-working on, M-mastered | Activities/sites teachers can use to meet standard |
|--|---|---|---|
| a. With guidance from an educator, students consider and set personal learning goals and utilize appropriate technologies that will demonstrate knowledge and reflection of the process. | | | <p>Twitter account as a class</p> <p>Digital Portfolio-start for them to add to later</p> <p>Seesaw</p> <p>https://www.whatihavelearnedteaching.com/student-goal-setting-in-elementary/</p> <p>https://sites.google.com/a/c084.org/mr-shaffer/studentlearning/student-goal-setting/goal-setting-tools</p> |
| b. With guidance from an educator, students learn about various technologies that can be used to connect to others or make their learning environments personal and select resources from those available to enhance their learning. | | <p>Identify the basic components of the computer: monitor/screen, keyboard, mouse/touchpad, headphones, ports, and printers. I</p> <p>Understand difference between closing applications, logging off, and shutting down the device. I, W</p> <p>Turn on/off a computer, laptop and/or hand-held device. I, W, M</p> <p>Use desktop icons, windows, and menus to</p> | <p>Blog</p> <p>Twitter account as a class</p> <p>Google Hangouts</p> <p>Google Apps-share documents with each other</p> |
| | | <p>Use gestures to navigate <u>hand-held</u> devices (ie. swipe, use fingers to expand or contract) I, W, M</p> <p>Use mouse or touchpad to manipulate shapes, icons; click on URLs, radio buttons, check boxes; use scroll bar. I</p> <p>Utilize basic troubleshooting steps to solve technical problems independently. I</p> <p>Use login credentials for access to network devices, Accounts, and cloud services (ie. tablet devices, AR applications, RAZ, IXL,</p> | |
| c. With guidance from an educator, students recognize performance feedback from digital tools, make adjustments based on that feedback and use age-appropriate technology to share learning. | <p>Art 0-3.1.2.1.1 (Grades K-3) Identify technology in a variety of dance contexts for research and feedback.</p> <p>Art 0-3.3.1.2.2 (Grades K-3) Media Arts: Reflect on a presentation based on the feedback of others.</p> <p>Art 0-3.3.1.5.2 (Grades K-3) Visual Arts: Reflect on a presentation based on the feedback of others.</p> | | <p>Google Classroom-discussion questions</p> <p>Google Docs-comments</p> <p>Create a survey to get feedback</p> <p>Poll Everywhere-add extension to Google Slides</p> <p>Google Forms Quiz</p> |
| d. With guidance from an educator, students explore a variety of technologies that will help them in their learning and begin to demonstrate an understanding of how knowledge can be transferred between tools. | <p>Art 0-3.1.2.2.1 (Grades K-3) Identify how hardware such as digital still cameras, digital video camcorders and computers are used for creation of media arts.</p> <p>Art 0-3.1.2.2.2 (Grades K-3) Identify the functions of software such as photo-editing, video-editing and sound-editing tools, in creating original products for expressive intent</p> | <p>Apply prior technical knowledge and experiences to figure out how new technologies or application work. I,W</p> <p>Utilize basic troubleshooting steps to solve technical problems independently. I, W</p> | <p>Give students a choice for projects</p> <p>Introduce new sites and let them explore</p> |

Digital Citizenship

Students recognize the rights, responsibilities, and opportunities of living, learning and working in a interconnected digital world, and they act in ways that are safe, legal, and ethical.

| What the ISTE Standard says | What MN Standard(s) address this category? | Knowledge/Skills required to complete this category I-introduce, W-working on, M-mastered | Activities/sites teachers can use to meet standard |
|---|--|---|--|
| a. Students practice responsible use of technology through teacher-guided online activities and interactions to understand how the digital space impacts their life. | | Use technology independently and with peers responsibly to make safe choices. IW Build a positive digital footprint/reputation and understand that digital content is permanent and cannot be deleted. I, W | https://www.netsmartz.org/TeachingResources https://www.common Sense.org/education/scope-and-sequence -k-12 scope and sequence Create posters to go around school warning students that everything they do online is never erasable. https://sites.google.com/a/q84.org/mr-shaffer/studentlearning/student-goal-setting/goal-setting-tools |
| b. With guidance from an educator, students understand how to be careful when using devices and how to be safe online, follow safety rules when using the internet and collaborate with others. | | Understand how to be safe online and in a digital world. I Understand the positive and negative effects of social media sites and chat rooms can have on one's life. I Understand how to practice safe internet searches. I | https://www.common Sense.org/education/scope-and-sequence -k-12 scope and sequence https://www.netsmartz.org/TeachingResources https://www.safesearchkids.com/-safe search engine https://jr.brainpop.com/artsandtechnology/technology/internetsafety/ https://www.edutopia.org/blog/internet-safety-younger-elementary-mary-beth-hertz |
| | | | https://www.edutopia.org/blog/internet-safety-younger-elementary-mary-beth-hertz |
| c. With guidance from an educator, students learn about ownership and | Media Literacy 3.8.4.4 (Grade 3) | Transfer the information learned from online sources into your own words. I | https://www.common Sense.org/education/scope-and-sequence -scope and sequence for k-12 |

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| sharing of information, and how to respect the work of others. | Report on a topic or text and avoid plagiarism by identifying sources, tell a story, or recount an experience with appropriate fact and relevant, descriptive details, speaking clearly at an understandable pace. | Understand all rules and guidelines in the school's Responsible Use Policy. I, W | http://www.crazy4computers.net/copyright-law-fair-use.html -copyright |
| d. With guidance from an educator, students demonstrate an understanding that technology is all around them and the importance of keeping their information private. | Media Literacy 3.8.7.7 (Grade 3) Distinguish among, understand, and use different type of print, digital, and multimodal media. d. Recognize safe practices in personal media communications. | Understand the importance of not sharing personal information online. I, W Protect accounts by logging out of shared equipment. I, W Keep passwords confidential, and be proactive if they are compromised.I Use passcodes/passwords to secure individual devices. I | https://www.common Sense.org/education/scope-and-sequence -scope and sequence for grades k-12 https://www.kcusd.com/apps/pages/index.jsp?uREC_ID=322003&type=d&pREC_ID=730461 |

Knowledge Constructor

Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experience for themselves and others.

| What the ISTE Standard says | What MN Standard(s) address this category? | Knowledge/Skills required to complete this category I-introduce, W-working on, M-mastered | Activities/sites teachers can use to meet standard |
|---|--|--|--|
| a. With guidance from an educator, students use digital tools and resources, contained within a classroom platform or otherwise provided by the teacher, to find information on topics of interest. | | Use age appropriate search engines to find information. I | https://www.safesearchkids.com/-safe search engine http://www.kidtopia.info/ https://www.sweetsearch.com/ https://www.kidzsearch.com/ |
| b. With guidance from an educator, students become familiar with age-appropriate | Media Literacy 3.8.7.7 (Grade 3) Distinguish among, understand, and use different type of print, | | https://educators.brainpop.com/lesson-plan/evaluating-online-sources-lesson-plan-everything-internet-true/ |

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| criteria for evaluating digital content. | digital, and multimodal media. a. Make informed judgements about messages promoted in the mass media (e.g., film, television, radio, magazines, advertisements, newspapers). b. Locate and use information in print, non-print, and digital resources, and identify reasons for choosing information used. c. Check for accuracy in pictures and images d. Recognize safe practices in personal media communications. Media Literacy 0-3.8.8.8 (Grades K-3) With prompting and support, create an individual or shared multimedia work for a specific purpose (e.g., to share lived or imagined experiences, to present information, to entertain, or as artistic expression.)* <i>*Grades 2-3 have additional requirements for this standard:</i> | | |
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| | a. <i>With prompting and support, critique each found image under consideration for use in a multimedia project for its appropriateness to purpose, its effectiveness in conveying the message, and its effect on the intended audience and justify its use in the project.</i> | | |
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| c. With guidance from an educator, students explore a variety of teacher-selected tools to organize information and make connections to their learning. | | Create, save, edit, copy and rename files and folders to organize documents and materials. I Understand how cloud storage is different from using software application storage. I, W Name documents with appropriate file names and understand where files are being located/saved. I, W | Google Keep Google Drive Folder on desktop computers Pinterest |
| d. With guidance from an educator, students explore real-world issues and problems and share their ideas about them with others. | | | Virtual Field Trips Google Hangouts |

Innovative Designer

Students use a variety of technologies within a design process to solve problems by creating new, useful, or imaginative solutions.

| What the ISTE Standard says | What MN Standard(s) address this category? | Knowledge/Skills required to complete this category I-introduce, W-working on, M-mastered | Activities/sites teachers can use to meet standard |
|---|--|--|---|
| a. With guidance from an educator, students ask questions, suggest solutions, test ideas to solve problems and share their learning. | | | 3D printer-can create ideas in many sites online https://www.canva.com/learn/19-ideas-to-promote-more-creativity-in-your-classroom/ Twitter Google Site |
| b. Students use age-appropriate digital and non-digital tools to design something and are aware of the step-by-step process of designing. | | | https://www.eduplace.com/graphicorganizer/ graphic organizer pdfs code.org |
| c. Students use a design process to develop ideas or creations, and they test their design and redesign if necessary. | | | Code.org-coding 3D printing |
| d. Students demonstrate perseverance when working to complete a challenging task. | | | Coding-code.org 3D printing |

Computational Thinker

Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.

| What the ISTE Standard says | What MN Standard(s) address this category? | Knowledge/Skills required to complete this category I-introduce, W-working on, M-mastered | Activities/sites teachers can use to meet standard |
|--|---|---|---|
| a. With guidance from an educator, students identify a problem and select appropriate technology tools to explore and find solutions. | Science 1.1.3.2.1 (Grade 1) Recognize that tools are used by people, including scientists and engineers, to gather information and solve problems. For example: Magnifier, snowplow, calculator. | Use basic drawing tools including pencil, paint brush, shape line, undo, red, and eraser. I, W Use text tool to add text features to artwork. I, W Use color palette/color wheel to change tool color. I, W Use selection tools to copy, paste, move, and modify work. I | http://www.mathwire.com/problemsolving/probs.htm https://jr.brainpop.com/math/mathstrategies/solvingwordproblems/ https://www.edutopia.org/practice/real-world-problem-solving-project-based-solutions |
| b. With guidance from an educator, students analyze age-appropriate data and look for similarities in order to identify patterns and categories. | Math 1.2.1.1 (Grade 1) Calculators can be used to create and explore patterns. Math 2.1.1.6 (Grade 2) Use addition and subtraction to create and obtain information from tables, bar graphs, and tally charts | | https://www.mathplayground.com/ IXL https://www.khanacademy.org/coach/dashboard http://www.kidsites.com/sites-edu/math.htm |
| | Science 3.1.1.2.3 (Grade 3) Maintain a record of observations, procedures and explanations, being careful to distinguish between actual observations and ideas about what was observed. For example: Make a chart comparing observations about the structures of plants and animals. | | |
| c. With guidance from an | | | https://www.mathplayground.com/ |

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| educator, students break a problem into parts and identify ways to solve the problem. | | | IXL https://www.khanacademy.org/coach/dashboard http://www.kidsites.com/sites-edu/math.htm |
| d. Students understand how technology is used to make a task easier or repeatable and can identify real-world examples. | Math 3.1.2.2 (Grade 3) Use various strategies, including the use of a calculator and the relationship between addition and subtraction, to check for accuracy. | | https://www.mathplayground.com/ IXL https://www.khanacademy.org/coach/dashboard http://www.kidsites.com/sites-edu/math.htm |

Creative Communicator

Students communicate clearly and express themselves creatively for a variety of purposes using the platforms, tools, styles, formats, and digital media appropriate to their goals.

| What the ISTE Standard says | What MN Standard(s) address this category? | Knowledge/Skills required to complete this category I-introduce, W-working on, M-mastered | Activities/sites teachers can use to meet standard |
|---|--|--|--|
| a. With guidance from an educator, students choose different tools for creating something new or for communicating with others. | | <p>Is polite and respectful in all communications and collaborations using technological tools, using appropriate language at all times. I</p> <p>Use email, messaging and other tools to share information and communicate ideas with others. I</p> <p>Compose and send an email. I</p> <p>Understand the difference between reply, send, reply all, and forward when responding to an email. I</p> <p>Set up, share and utilize collaborative workspaces, documents, or other digital tools for asynchronous and synchronous collaborations. I</p> <p>Use a digital camera, video camera, or camera on a handheld device to take pictures and video. I,W</p> | <p>Google Slides</p> <p>Google Docs</p> <p>Google Drawing</p> <p>https://www.verywellfamily.com/best-free-educational-websites-for-kids-3129084</p> <p>Abcya.com</p> <p>http://blog.connectionsacademy.com/the-best-educational-websites-and-online-learning-games-for-k-8-students/</p> |
| | | <p>Insert and resize images within a document. I</p> <p>Proofread and edit writing using built-in resources (ie. dictionary, spell check) I</p> | |
| b. Students use digital tools to create original works. | | <p>Create a series of slides and organize them to present research or convey an idea. I</p> <p>Copy/paste or import graphics within a multimedia presentation. Be able to change their size and position on a slide. I</p> | <p>Google Drawings</p> <p>Befunky.com-image changer</p> |
| c. With guidance from an educator, students share ideas in multiple ways - visual, audio, etc. | | <p>Use digital tools to create timelines of people, historical events, etc. to organize information sequentially. I</p> <p>Use audience response tools and apps to participate in class discussions. I</p> | <p>Speakpipe.com-record voice</p> <p>Screencastify-record voice, screen, and can add webcam</p> |
| | | <p>Create, edit, and format text, visuals, and audio within a multimedia presentation. I</p> | |
| d. With guidance from an educator, students select technology to share their ideas with different people. | | | <p>Share on teacher's website</p> <p>Create a digital portfolio that houses their work</p> <p>Youtube channel for class</p> |


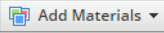











Global Collaborator

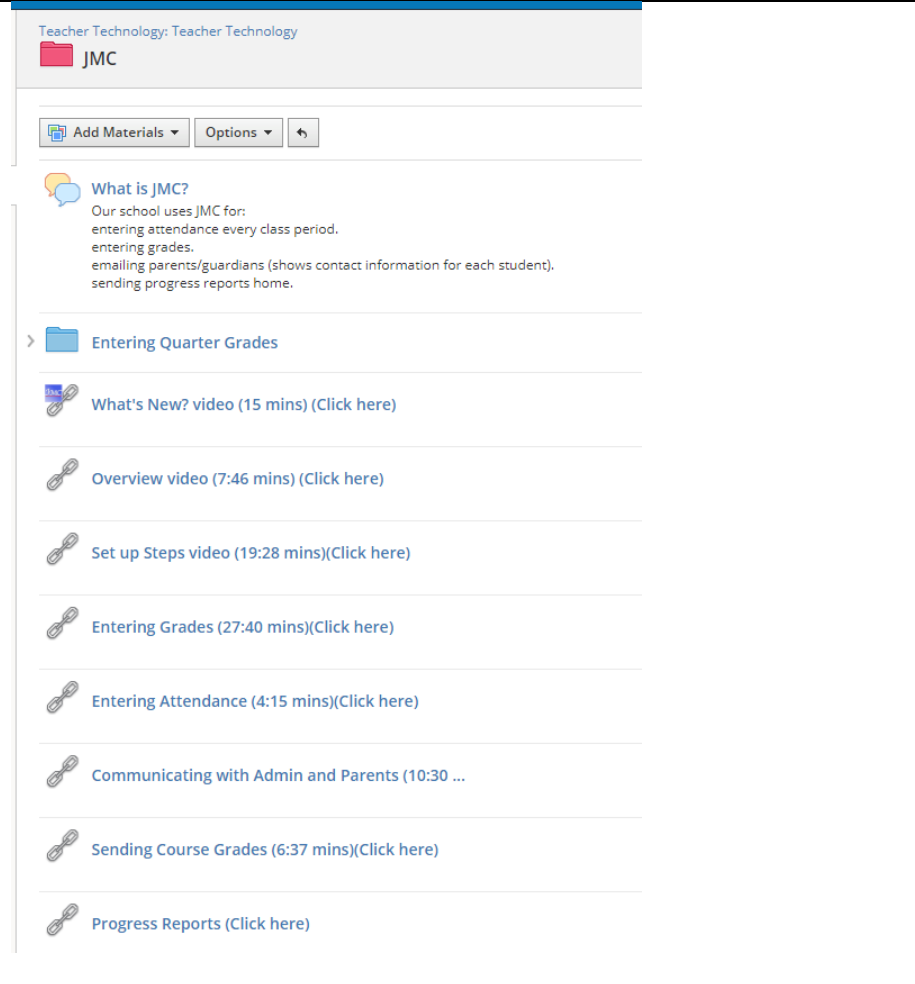
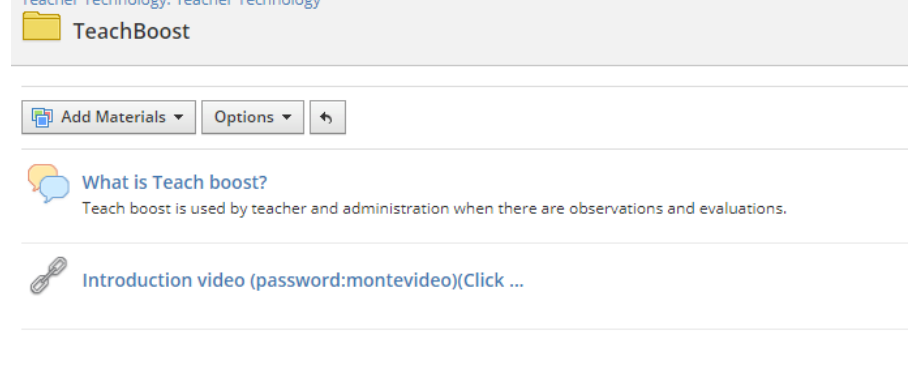
Student use digital tools to broaden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.



















| What the ISTE Standard says | What MN Standard(s) address this category? | Knowledge/Skills required to complete this category I-introduce, W-working on, M-mastered | Activities/sites teachers can use to meet standard |
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| <p>a. With guidance from an educator, students use technology tools to work with friends and with people outside their neighborhood, city, and beyond.</p> | <p>Media Literacy 0-3.6.6.6 (Grades K-3) With guidance and support from adults, explore a variety of digital tools to produce and publish writing*, including in collaboration with peers. <i>*At Grade 3, students are expected to be using keyboarding skills to accomplish this standard</i></p> <p>Media Literacy 0-3.8.8.8 (Grades K-3) With prompting and support, create an individual or shared multimedia work for a specific purpose (e.g., to share lived or imagined experiences, to present information, to entertain, or as artistic expression.)*</p> | | <p>Google Hangout Virtual Field Trips Skype, Google duo, or facetime</p> |
| | <p><i>*Grades 2-3 have additional requirements for this standard:</i></p> <p>a. <i>With prompting and support, critique each found image under consideration for use in a multimedia project for its appropriateness to purpose, its effectiveness in conveying the message, and its effect on the intended audience and justify</i></p> | | |
| | <p><i>its use in the project.</i></p> <p>b. <i>Share the work with an audience.</i></p> | | |
| <p>b. With guidance from an educator, students use technology to communicate with others and to look at problems from different perspectives.</p> | <p>Media Literacy 0-3.8.7.7 (Grades K-3) Distinguish among and understand purposes of different types of printing, digital, and multimodal media.</p> | | <p>Google Hangout Virtual Field Trips Skype, Google duo, or facetime</p> |

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| <p>c. With guidance from an educator, students take on different team roles and use age-appropriate technologies to complete projects.</p> | <p>Media Literacy 2.8.5.5, 3.8.5.5 (Grades 2-3) Create audio recordings of stories or poems; add drawings or other visual displays to stories or recounts of experiences when appropriate to clarify ideas, thoughts, and feelings.</p> | | <p>Google Apps</p> |
| <p>d. With guidance from an educator, students use age-appropriate technologies to work together to understand problems and suggest solutions.</p> | <p>Art 0-3.3.1.2.1 (Grades K-3) Media Arts: Share and describe a personal media artwork</p> <p>Art 0-3.3.1.5.1 (Grades K-3) Visual Arts: Share and describe a personal artwork</p> <p>Media Literacy 0-3.8.8.8 (Grades K-3) With prompting and support, create an individual or shared multimedia work for a specific purpose (e.g., to share lived or imagined experiences, to present information, to entertain, or as artistic expression.)*</p> | <p>Use a word processing application to write, edit, or print and save assignments. I</p> <p>Use the menu/toolbar functions to format a document. I.e. change colors, select fonts, change font size. I</p> | <p>Google Apps</p> |
| | <p><i>*Grades 2-3 have additional requirements for this standard:</i></p> <p><i>b. Share the work with an audience.</i></p> | | |

Appendix D: Product 3—Schoolology


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| Main page | <p>Teacher Technology: Teacher Technology </p> <hr/> <p> Add Materials ▾  Options ▾</p> <hr/> <p>>  JMC</p> <hr/> <p>>  GoGuardian</p> <hr/> <p>>  TeachBoost</p> <hr/> <p>>  Google Classroom</p> <hr/> <p>>  Skyward/AESOP</p> <hr/> <p>>  Google Apps</p> <hr/> <p>>  Technology Resources</p> <hr/> <p>>  Smartboard Tips and Tricks</p> <hr/> <p>>  ISTE Standard Documents</p> <hr/> <p>>  Printers-3D, Poster</p> <hr/> |
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| <p>Inside JMC folder.</p> |  <p>Teacher Technology: Teacher Technology</p> <p>JMC</p> <p>Add Materials Options ↻</p> <p>What is JMC? Our school uses JMC for: entering attendance every class period. entering grades. emailing parents/guardians (shows contact information for each student). sending progress reports home.</p> <p>> Entering Quarter Grades</p> <p>What's New? video (15 mins) (Click here)</p> <p>Overview video (7:46 mins) (Click here)</p> <p>Set up Steps video (19:28 mins)(Click here)</p> <p>Entering Grades (27:40 mins)(Click here)</p> <p>Entering Attendance (4:15 mins)(Click here)</p> <p>Communicating with Admin and Parents (10:30 ...)</p> <p>Sending Course Grades (6:37 mins)(Click here)</p> <p>Progress Reports (Click here)</p> |
| <p>Teachboost folder</p> |  <p>Teacher Technology: Teacher Technology</p> <p>TeachBoost</p> <p>Add Materials Options ↻</p> <p>What is Teach boost? Teach boost is used by teacher and administration when there are observations and evaluations.</p> <p>Introduction video (password:montevideo)(Click ...)</p> |

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| <p>Google Classroom folder</p> | <p>Teacher Technology: Teacher Technology</p> <p> Google Classroom</p> <hr/> <p> Add Materials ▾  Options ▾ </p> <hr/> <p> What is Google Classroom? Google Classroom is an LMS. Our school is a Google school, so all our students have Google email accounts.</p> <hr/> <p> Before you begin (Click here)</p> <hr/> <p> Tips and Tricks for Teachers (Click here)</p> <hr/> <p> PDF of Getting Started with Google Classroom ...</p> <hr/> <p> Training Center (Click here)</p> <hr/> <p> Resources (Click here)</p> |
| <p>Skyward/AESOP folder</p> | <p>Teacher Technology: Teacher Technology</p> <p> Skyward/AESOP</p> <hr/> <p> Add Materials ▾  Options ▾ </p> <hr/> <p> What is Skyward? Skyward is a site that we use to: look at our check history. manage our time-off status. shows our W2 information.</p> <hr/> <p> Skyward (Click here)</p> <hr/> <p> What is AESOP? AESOP is a site that our school uses to manage substitutes.</p> <hr/> <p> AESOP (Click here)</p> |

Google Apps folder

Teacher Technology: Teacher Technology

 Google Apps Add Materials ▾

Options ▾



Google Drive (storage) (Click here)



Google Forms (quiz) (Click here)



Google Slides (Click here)



Google Sheets (Click here)



Google Docs (Click here)



Google Drawings (Click here)



Google Maps (Click here)


Technology Resources folder


Teacher Technology: Teacher Technology


Technology Resources


 Add Materials ▾  Options ▾ 


 [30 Chrome Extensions \(Click here\)](#)

 [Quizizz \(interactive quiz\) \(Click here\)](#)

 [Quizlet \(create study material\) \(Click here\)](#)


 [Screencastify \(create videos\) \(Click here\)](#)


 [Kahoot \(interactive quiz\) \(Click here\)](#)

 [Edpuzzle \(videos and questions\) \(Click here\)](#)

 [Teachers pay teachers \(resources\) \(Click here\)](#)

 [Renaissance Place \(accelerated reading\) \(Click ...\)](#)

 [Read Theory \(reading and writing\) \(Click here\)](#)

 [Equatio \(math\) \(Click here\)](#)

 [Lucid Chart \(graphs, charts, diagrams\) \(Click ...\)](#)

 [Seesaw \(k-5\) \(Click here\)](#)

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| <p>Smartboard tips and tricks</p> | <p>Teacher Technology: Teacher Technology</p> <p>Smartboard Tips and Tricks Prev Next</p> <p>Add Materials Options ↻</p> <p>How others are using their SMART Boards.</p> <p>If you cover up text with the white font color you can then use the eraser to reveal the text, this way it works like a scratch and sniff, w/o the smell of course. I scan a paper on the copy...</p> <p>SMART Exchange (lesson plans-activities) ...</p> <p>SMART Labs for Student Engagement</p> <p>SMART Notebook has a section titled SMART Labs. SMART Labs enable the teacher to create interactive games for review and practice. Some games have the ability to connect directly with a student's device, while other games require the student(s) to interact directly with the SMART Board.</p> <p>This folder provides guidance for using SMART Notebook Labs in your classroom.</p> |
| <p>ISTE Standards folder</p> | <p>Teacher Technology: Teacher Technology</p> <p>ISTE Standard Documents</p> <p>Add Materials Options ↻</p> <p>K-3 ISTE Standards</p> <p>4-5 ISTE Standards</p> <p>6-8 ISTE Standards</p> <p>9-12 ISTE Standards</p> |

Printers-3D and Poster folder

Teacher Technology: Teacher Technology

Printers-3D, Poster

 Add Materials ▾

Options ▾



Poster Printer

Directions to print to the poster printer:

1. create the poster.
2. save it as a PDF.
3. send it to the librarian.

3D Printer

Directions to print on the 3D printer:

1. find a design or create your own (I suggest using Tinkercad).
2. save as a .STL or .OBJ.
3. you will need to use the computer hooked up to the 3D printer...