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Action Research

Technology in Math Class

INTRODUCTION

Setting

I am a fifth grade teacher in a private Catholic school in Baltimore County. This past year was my first year teaching. I graduated in May 2008 with a Bachelor in Science Degree in Elementary Education from Salisbury University. While this year was overwhelming and stressful I found it to be more of a learning experience than I ever could have imagined. I truly believe that I was meant to be a teacher. My school also was appointed new administration this year. This administration took the form of a new principal and a new vice principal. The school has been able to develop a hands-on, open community between its students, faculty, parents, and parish. This results with supports for both teachers and students at several different fronts.

At my school this past year, the fifth grade was divided into three homerooms, as well as, three homogeneous ability groups based on their math abilities. The math groups were determined according to their previous year's math academic grade and their overall mathematics score on the Stanford 10th Edition. I was responsible for delivering reading and English curriculum and was able to lead a homeroom. Each homeroom included a heterogeneous mixture of students from the three groups. About a month ago, I was

informed that next year I will be teaching reading, English, and math. Math being a new addition to my responsibilities!

Upon hearing this news, an instant feeling of horror over took me. Math? I thought. I hate math but, of course, instantaneously I told my principal that I would love this new challenge and was up for anything new I could do! So, I went home and thought all the math thoughts I could think: fractions? decimals? conversions? I have no solid memory of how to perform these concepts. Through my entire academic years I have struggled with mathematics. I have been the student with a low C on a progress report in 6th grade and my parents refuted by providing a tutor for years following. I could not recall a positive memory I had regarding the subject area of math. While I am sure my teachers were excellent teachers, at no time in my past did I personally enjoy a math class. As a teacher, I do not wish negative memories on any student concerning their academic years. I thrive to provide my students with positive thoughts and understandings regarding the things that are discussed in my classroom, even when a concept may be difficult to grasp. I do not want any students to leave feeling as though they failed or have to suffer through any of my lessons. At that moment, I decided that I would spend my summer vacation learning anything and everything I could about 5th grade math! I swore off all negative thoughts regarding my previous feelings towards the subject and made feeling confident and comfortable with math and becoming the best math teacher I could be as my newest goals!

Area of Focus

At the same time I was discovering the news about my new roles for next year as a teacher, I was accepted into Loyola College's Educational Technology Masters Program. I feel that technology is something that will continue to be a strong driving force in our society and, therefore, should be a strong component in our classrooms. Technology, including and going beyond the simplicity of a basic PowerPoint presentation and the use of an overhead projector illuminating a transparency, I feel can only help enhance a student's learning experience. It can help engage students. It can provide a form of exploration for students. It can become a way of enriching a lesson and allow for students' understanding of a concept be enhanced and extended. Technology should be used and can be used as a positive attribute in any classroom.

I immediately was driven to the idea of how technology could be used in my math curriculum. I thought that if I was so hesitant about mathematic concepts, my future students may harbor the same hesitations. Seeing math from a perspective that technology can provide, may show my students that math can be easily related to their everyday life, as well as, fun and interesting. My goal is to create a learning environment where my students can use inquiry based learning to discover how math concepts can relate to them personally. Finding a way that technology can help provide this is my focus for this Action Research.

My school has the benefit of having enough laptop computers that it is easy to reserve them for use during a given class period. I feel that it is a hindrance to students if forms of technology are accessible but not used in a classroom. I want to discover how I can use

my abilities as a teacher to provide my students with opportunities to explore, discover, and develop understandings using different computer programs available. I believe that integrating technology into my math curriculum will help build my students' comprehension of mathematic concepts and help them become active participants in my instruction.

Definition of Key Terms

For this Action Research the key terms to be defined are:

Technology – a form of media that provides information in a variety of ways: the use of the internet, lap top computers, projector, computer programs, interactive games and programs; a driving force of our society

Mathematics – the study of numbers, procedures, operations, and properties and their relation to our everyday lives

Elementary Mathematics – mathematic curriculum in grades 3-5

Research Question (s)

1. How can I use technology to enhance conceptual understandings in elementary mathematics?
2. How can I use technology to engage and motivate students in elementary mathematics?

LITERATURE REVIEW

The following literature review is offered to further explore my area of focus, how technology can be used in my classroom to enhance conceptual understandings in mathematics and how technology can help engage and motivate students in mathematics.

Technology in Mathematics

According to the National Council of Teachers of Mathematics (2000), “technology is essential in teaching and learning mathematics; it influences the mathematics that is taught and enhances students’ learning,” (p. 24). Cheng-Yao Lin (2008) stated that using technology effectively as a learning tool improves students’ mathematics achievement. Technology should be used in mathematic lessons both as a motivator and an enhancement for students. Technology has the power to help enrich the learning environment for students. “The very nature of our technology driven society elevates the status of collaboration and connectivity in the processes of gathering, applying, and sharing information in the learning process,” (Charnitski & Harvey, 1999, p.4). Charnitski and Harvey (1999) pointed out that in a joint document created by the National Science Foundation and the U.S. Department of Education in 1995 it was stated that the appropriate use of technology has the potential to improve teaching and learning, expand and enrich opportunities for learning, and link schools and learning sites to provide students access to the broader society.

Johnson (2009) stated that in the era we are living in technology is fast growing, computers are valuable instruments that can be used in the way we teach students. He

then went on to state, “the goal of many elementary teachers is to develop a classroom with active students that can be critical thinkers when solving math problems. For many students, mathematics is a subject that can be discouraging if not understood,” (2009, p.1). Today the use of computers can help students feel more confident in the area of mathematics therefore more motivated in the area of mathematics. Paino (2009) reported that technology can allow children of various ability levels to work at their own pace without creating feelings of embarrassment and inadequacies. Paino (2009) continued with stating that computers now can also play the role of a tutor, as students use programs they can work at their own pace and receive immediate feedback; drill-and-practice software provide learners with an opportunity to practice a single skill that was already taught. Mendicino and Heffernan (2009) also felt that using technology as an assistant to the student would help enhance student learning and motivation, “ new intelligent tutoring systems that guide students through math problems much the way human tutors do have been successful in helping students learning math in the classroom,” (p. 331). Students do not enjoy a subject they do not understand. Technology can help students better understand mathematics. With the cost of technology and software decreasing and the resources one can find on the Internet, having technology be apart of a mathematics lesson is not difficult, (Johnson, 2009, p. 2).

Using Technology as a Motivator

“Stop, for heaven’s sake! I hate math,’ ‘Pure torture from the start of school,” (Enzensberger, 1999, p.9). Math is not always associated with good feelings. For many people, mathematics during school years did not leave them with positive feelings. David Mumford (2006) offered the following question, “Does memorizing your multiplication

tables and learning strenuous algorithms like long division cause in some a permanent antipathy towards numbers?” (p. 27). He then answers his question by stating that it is a shame people have developed negative feelings towards mathematics, “learning arithmetic should be like learning to drive: an essential skill in our quantitative society that allows you to manage a lemonade stand or hoodwink your shareholders in a Fortune 500 company,” (2006, p. 27). Guhal and Leonard (2002) also point that “establishing and maintaining classrooms where students are eager and motivated to learn mathematics continues to be one of the goals of the mathematics education community,” (p. 40). Technology can help create positive associations with mathematics.

“Algebra, geometry, [and other mathematic areas] – require patience and perseverance to master. That kind of academic stamina is hard to advertise to kids nurtured on instant engagement and gratification of modern technology,” (Demski, 2009, 2). Students want to know how the things they are being taught in school apply to their real lives. They want connections. Demski (2009) points out in her article that if you can not give students real world connections they turn-off; if you can not explain it to them in a way that they relate to or show them how the concept applies to them, they are not with you, (p. 2). “Today’s [students] have never not known the internet,” says Fields, the CEO and founder of HotChalk, a provider of online learning resources, (Demski, 2009, p. 2). Fields continues,

“The vast majority of them have a Sony PlayStation or a Wii or an Xbox in their homes. And the amount of media that’s focused on them is mind-blowing when

you think about Nickelodeon, the Disney Channel... and all the other content that's coming their way," (Demski, 2009, p. 2)

Textbooks can not provide students with the real-life scenarios and applications that technology can. "[Textbooks] require students to make too great a leap to see how math and the real-world scenario they are linked," (Demski, 2009, p.4). In a study conducted by Robyn Pierce, Kaye Stacey, and Anastasios Barkatsas (2005) they hypothesized and later concluded that "more real problem solving, making mathematics more relevant to students' lives and more interesting... will lead to increased engagement [of students]," (p. 2). Mumford (2006) points out that one of the main reasons people may hate math is that it is too abstract and it loses touch with anything the student can relate to his/her immediate world, (p. 27). Technology helps change this. Technology brings concepts and ideas to life with color and scenarios and 3D images. Technology associates what students are learning in the classroom to the world they are living in each day, acting as a motivator or form of engagement.

"Computers are intrinsically motivating," (Guhil & Leonard, 2002, p. 42). Mumford (2006) states, "Having such technological tools changes the educational landscape. If used properly, these tools make mathematics: (i) fun, not tedious; (ii) tangible because it's all there in front of you; and (iii) visual because you can also graph all the quantities," (p. 27). During interviews that C.Y. Lin (2008) conducted she discovered further evidence of the use of technology being a motivator and form of engagement for students, nine out of ten of the pre-service teachers she spoke with stated that using technology in the mathematics classroom was important. Her data showed that

computers allow for students to receive a visual representation of a concept that would often be impossible to how with a pen and paper or by simply using a chalkboard. One of C.Y. Lin's interviewees was quoted regarding technology as a motivator, "Kids love getting on the computer, and a lot of [the math games], so they're learning, but they're also having fun... computers are a motivator... they see it as being fun and something exciting and new," (2008, p. 138).

Guidelines for Using Technology in Mathematics

Technology would be beneficial for students in a mathematic classroom but it is up to the teacher to determine how, when, and what kind of technology is used in their classroom. "Ultimately, teachers' beliefs will determine the extent to which they will use motivating technology in the classroom," (Guhil & Leonard, 2002, p. 42). In the year 2000, the National Council of Teachers of Mathematics concurred with this idea, stating that "teachers' attitudes play in an important role in using technology in teaching and learning mathematics," (p. 24). One part of a teacher's job is to continue to learn and embrace the changes of our society. A teacher who expresses a positive attitude towards technology in the classroom can cause their students to see technology as a positive part of instruction.

A fear that technology will overthrow the teacher should be immediately pushed aside. Implementing computers into the mathematics classroom should be a teacher's goal... technology should not be a teacher's foe, but rather a friendly, useful tool that can be utilized to engage students and enhance a mathematic lesson, (Johnson, 2009, p.5). "Teachers... can find comfort and encouragement with the use of computers. Teachers

have a wide range of possibilities when it comes to integrating the use of computers into teaching math on the elementary level,” (Guhil & Leonard, 2002, p. 42). Technology is not meant to be the only source of learning students receive in the classroom but an enhancement to the concept being discussed.

Sturdivant, Dunham, and Jardine (2009) point out that with the era of technology continuing to make advancements and changes teachers are bound to make mistakes when using technology in their classrooms, (p. 165). They offer a few cautions gleaned from past experiences using technology with students in a mathematics class:

- Make perfectly apparent to your students when you feel technology use is appropriate or inappropriate.
- Don't overwhelm students with technology at the expense of their learning mathematics.
- Allocate some course time to learning of technology.
- Provide printed or online instructions for new commands
- Allocate plenty of preparation time toward developing worksheets, web pages, and other technology-based learning activities.

Conclusion

We are living in a world that runs on technology. Students are coming into classrooms having been exposed to the fast-paced world of technology on a daily basis. Grabbing students' attention and holding onto it long enough to explain a concept or discuss a process in mathematics can be assisted with the appropriate use of technology. Technology can be used as a confidence-builder, a motivator, an enrichment source, an engagement source, as well as, a tool to bringing the real-world into the classroom. It is up to the teacher to use technology in a way that benefits their students.

RESEARCH DESIGN

Overview of Methodology

“Educational researchers... are concerned with gaining insight into human behavior in educational environments,” (Mills, 2007, p.3).

Action research is a way in which educators can not only improve their personal technique but enhance the learning environment of their students and other teachers. While action research is similar to traditional research its main focus and goal differ. “The goal of traditional educational research is to explain, predict, and/or control educational phenomena... action researchers are committed to *taking action* and *affecting positive educational change* based on their findings,” (Mills, 2007, p.3). Action research should be a part of a teacher’s practice, “meaningful teacher inquiry should not *depart from* the daily work of classroom teachers, but become *a part of* their daily work,” (Dana & Yendol-Hoppey, 2009, p. 73). As a first-time action researcher I am learning the foundation of action research and the importance and meaning of qualitative data, as I perform the process of action research, “an action research process includes the four elements... identifying an area of focus, collecting data, analyzing and interpreting data, and developing an action plan,” (Mills, 2007, p.19).

Learning and teaching styles vary from student and educator. Each teacher and student has their own niche, their own style. Being aware of this and using it to an action researcher’s benefit involves the use of qualitative data collection and analysis in action research. “Qualitative research uses narrative, descriptive approaches to data collection to understand the way things are and what it means from the perspectives of the research participants,” (Mills, 2007, p.4). For my research, I have collected qualitative data and

made assertions based on that data that would be relevant to my area of focus. Qualitative data allows for exceptions to be made and expected based on the different environments data is collected. No one classroom works in the same manner.

Sources

Questionnaire/ Survey – 4th and 5th grade students answered questions regarding their current math class; students answered questions regarding concepts discussed in math and the use of technology by them and their teacher. The questionnaire also asked students how comfortable they are with using computers using a scale. The use of the scale created the collection of quantitative data in a survey format.

Interview – Several interviews were conducted in informal manners; I interviewed 4th and 5th grade math teachers regarding concepts discussed and technology used in the classroom, I also asked questions regarding the benefits and detriment of technology. I also interviewed a current education major who was required by her high school to use a lap top throughout her high school career. I asked her how this use of technology affected her academics and if she felt her elementary school prepared her for this experience.

Survey – a survey given to several colleagues allowed me to see what forms of technology are available and how they are used in the classroom, as well as, if they saw technology as a positive or a negative element to the learning environment.

Procedures of Verification – Validity

Validity refers to “how we know that the data we collect accurately gauge what we are trying to measure,” (Mills, 2007). Since my action research deals with the

collection and analysis of qualitative data, the validity of my data will reflect Mills' definition of validity "whether the actual solution to a problem ([my] planned intervention) actually solves [my] problem," (Mills 2007, p.85). In order to ensure that my qualitative data is valid I used several of Wolcott's Strategies for Ensuring the Validity of Action Research presented by Mills, as well as, other forms of verification. I employed the strategies of "talk little; listen a lot," and "write accurately," (Mills 2007, p. 93-94), during each of my interviews. I also sent my interviewees copies of the interviews. This will ensure that I wrote accurately what was said during the interviews and that I documented the setting of the interviews. In regards to data obtained from the surveys and questionnaires I was conscious of not leading participants to answer questions in a certain manner. I allowed participants to feel comfortable providing their answers by not requiring them to provide their names on the documents. I have original notes and codes used, as well as, all hand-written or typed drafts of all sources, interviews, and other documents written throughout my action research. I also have a personal research journal that substantiates all steps I have taken throughout my action research process.

Ethical Consideration

In regard to ethical consideration throughout my action research, I first thought about whom I would be gaining data from, my students, colleagues, and people I felt had knowledge regarding my area of focus. I then thought how I could ensure they were informed and comfortable with what I was doing. In order to protect the participants in my action research, as well as, myself, I will not include any names or actual settings in any formal document. I also was sure to inform all participants of my intent with the data

and where the data was ultimately going to be placed. My interviewees were aware that they may stop an interview at any time.

DATA ANALYSIS AND INTERPRETATION

The purpose of my action research was to find ways to enhance conceptual understandings in elementary mathematics using technology, how to use technology to engage students in elementary mathematics, and how to use technology to motivate students in elementary mathematics. Before I could answer these questions and create an action plan, I had to collect and analyze data regarding how technology was already being used in the classroom. My data considered how comfortable students were with using technology in the classroom, how comfortable teachers were using technology in the classroom, what forms of technology are available, what students, teachers, and parents thought about technology specifically its positives and negatives. Finally, my data considered which mathematical concepts students and teachers found to be the most difficult to teach and understand. I collected this data from several sources and was able to draw conclusions

Findings

Student Data

The following data was collected from a questionnaire given to a mix of 68 fourth and fifth graders at the same school. Technology is available at this school in the form of

laptops, enough for an entire class, document cameras, ceiling projectors, and classroom computers.

Table 1 – Questionnaire results on hardest concept discussed this past year; questionnaire was given to a mix of 68 fourth and fifth graders at the conclusion of their school year

CONCEPT	Number of students who listed concept as the hardest concept
Decimals	13
Fractions	12
Geometry	8
Area	6
Long Division	5
Conversions	5
Circumference	4
Median, Range	4
Did not answer	4
Place Value	2
Divisibility	2
Problem Solving	1
Order of Operations	1
Algebra	1

What concept students' found most difficult in Mathematics

How can we improve on conceptual understandings if we do not know which concepts students find the most difficult to understand? The purpose of this question in the questionnaire was to find which topic covered over the course of the year students found the most difficult. From here, I can find ways to use technology to help students better understand these concepts. The data collected shows decimals, with 13 students saying it was the most difficult concept, and fractions, with 12 students saying it was the most difficult concept. I can conclude that these are two areas that technology can be used to help enhance student understanding of the concepts.

Table 2 – Questionnaire results on how comfortable students are with computers, answered on a scale of 1-10, 1 being not at all 10 being extremely comfortable; questionnaire was given to a mix of 68 fourth and fifth graders at the conclusion of their school year

Scale	10	9	8	7	6	5	4	3	2	1
Number of students responded	24	18	12	7	2	2	3	0	0	0

How comfortable are students using computers?

Computers and technology can help students in the classroom if they are comfortable using them. The purpose of this question was to address how comfortable they feel using computers. The data collected through the questionnaire shows that 54 students out of 68 feel that they are *extremely comfortable* or *very comfortable* using computers. The data also shows that no student feels *not at all comfortable* with computers.

Table 3 – Questionnaire results on whether technology was used in students' math class this past year; questionnaire was given to a mix of 68 fourth and fifth graders at the conclusion of their school year

Yes	No
23	45

Are computers and technology being used in the classroom?

If computers and technology are available for use, are they being used? The data collected shows that more than half of the students did not use computers and/or technology in their Math class this past year.

Teacher Data

The following data was collected from elementary grade level teachers. Teachers are highly qualified and have access to technology in the forms of laptops, enough for an entire class, document cameras, ceiling projectors, and classroom computers, personal laptops, and several computer programs. Teachers also have access to two on-call technology advisors. The data was collected through interviews and surveys.

Data from Surveys

Is technology being utilized in the classroom?

The data collected for several surveys revealed that the majority of teachers are using PowerPoint presentations with their students on a weekly basis. The PowerPoint presentations are created by the teacher and are projected for the entire class to see. The data showed that while laptops are available for student use, the majority of teachers do not use them with their students. The survey had an area for additional comments after its completion. One third grade teacher wrote, "I teach 3rd grade. My 3rd graders can not use a laptop. It would take too much time to introduce that type of technology with my class so I do not use them," (2009, personal communication).

Are teachers comfortable with technology?

On a scale of 1-10, 1 being not at all comfortable using technology and 10 being extremely comfortable using technology, only one out of 6 teachers said they were extremely comfortable using technology. The data used that most teachers rate their comfort level with technology at a 5.

Data from Interviews

What Mathematical concepts teachers found most difficult to teach?

When teaching, teachers find some concepts more difficult to teach to students. Motivating and engaging students and then having them develop an understanding of a given concept can be harder at times than others. Data collected through separate interviews of a fourth grade and a fifth grade teacher show that they found long division and fractions to be the most difficult to teach. When discussing the concept Teacher A said, “Long Division! Definitely long division. It was hard for me to even speak through the steps at some points,” (personal communication, 2009).

Students’ reaction to technology

How students respond to the use of technology can show technology as either a positive or negative addition to the classroom. When asked about her students’ reaction to technology being used in the classroom Teacher A said, “They love it! I think [technology] is definitely engaging for students. It is something they get excited about and look forward to during class. Anything that my students WANT TO DO ACADEMICALLY is always seen as a benefit to me,” (personal communication, 2009). Another teacher, Teacher B, said that while she does not use technology often in her classroom and has never reserved the laptops for her students, she does use her laptop to play academic games with the students using the projector. She said that on the days she uses technology in this manner her students enter and leave her classroom with a smile.

Is technology in the classroom viewed as beneficial to the students?

If I want to use technology as a way to engage students and enhance their understanding in a Mathematics class I want to know if it is viewed as beneficial to the students. The data I collected through interviews with teachers shows that technology is seen as a benefit and a necessity in the classroom. Both teachers said that they plan to increase their use of technology in their Math curriculum, as well as, other subject areas. Both teachers felt that the world we live in is a technology driven world and technology is something their students are very familiar with. When answering the question *do you see technology in the classroom as beneficial to your students*, Teacher A replied,

“Yes, very much. It is something they can relate to. They use computers. They love video games and YouTube. I hear about websites and music sites that they visit at home all the time. Technology allows students to connect their lives to school. It is something that they are becoming more and more familiar with and [find it relatable],” (personal communication, 2009).

Parent and Perspective Teacher Data

An interview with a parent whose daughter was required to use a laptop throughout her high school career allowed me to discuss how technology can be used to its fullest potential and if it is seen as a positive or a negative. The parent stated that she found technology to enrich her daughter’s academics “because technology was right, literally at her fingertips. [We] are in a time when everything is computer based [and] she now knows how to use a laptop at its fullest,” (personal communication, 2009).

An interview with a college student who is majoring in secondary education allowed me to look at how future teachers view technology and computers. When asked

if she plans to use technology with her future students the perspective teacher answered, “Yes. Honestly, growing up in this technology age... I do not know how I would not use technology,” (personal communication, 2009).

Conclusion

The data collected can allow for several conclusions to be drawn. First, it shows that students are comfortable using technology and find it engaging and enjoyable. Second, the data also shows that decimals and fractions are two of the most difficult Mathematical concepts for fourth and fifth graders to understand and decimals and long division are difficult for teachers to approach. Lastly, the data shows that technology is available in the classroom and when used is seen as a benefit to students and teachers both current and perspective plan to utilize technology to enrich their curriculum.

ACTION PLAN

Intervention

Based on the results of my data analysis and interpretation and the information collected from my literature review, I will administer the following plan of action in my mathematics 5th grade class for the upcoming school year. I will also share my findings and action plan with other mathematic teachers in my school. My action plan includes the following interventions that will be limited to my own classroom:

- Create a schedule that will ensure I reserve the laptop computers for my mathematics class, at least, once a week, this will depend on projects and other assignments that may require the use of computers more than one day in a week
- Discover the comfort level my students have with computers during the first week of school by giving them a questionnaire to fill out

- Find a website or software program that I will use throughout the year and introduce it to students during the first few weeks of school
- Using software program for drill and practice with students starting at the beginning of the year and continuing throughout the school year
- Plan time to introduce all new technology programs or tools with students before having students use them
- Review rules and guidelines for safely using technology with students at the beginning of the year and reminding throughout the school year
- Require portions of homework to be completed using technology
- Look for technology resources available before introducing new concepts

Timeline

Summer – look for technology resources that will enhance the curriculum I teach: websites, software programs, graphic calculators; find a website that offers drill-and-practice for multiplication and division; create a schedule that will include a day of laptops each week in my mathematic class; polish proposed action plan

Fall – announce to students that we will be using the laptop computers at least one day each week in math class; have students fill out questionnaire to discover comfort-level using laptop computers and other forms of technology, including graphic calculators; introduce students to the drill-and-practice website or program they will be using throughout the year; go over rules and guidelines for using technology safely; make necessary changes to action plan

Winter – continue to use laptop computers each week; introduce students to new technology resources; remind students of guidelines and rules for using technology safely; continue to have students use drill-and-practice website or program have students personally graph their scores; have students use technology in homework assignments; make necessary changes to action plan

Spring – continue to use laptop computers each week; have students use technology in a group-project setting; continue to have students use drill-and-practice and graph their scores; have students use technology in homework assignments; look at students drill-and-practice graphs; remind students of guidelines and rules for using technology safely; introduce new technology resources to students; have students fill out a questionnaire regarding the use of technology in their mathematics class during the past year; make necessary changes to action plan

Summer – review students’ drill-and-practice graphs and answers to questionnaire regarding the use of technology in their mathematics class; self-evaluate how comfortable I was using technology in my mathematic curriculum; evaluate how students were affected by the use of technology in their mathematic curriculum; make necessary changes to action plan for the next school year

Resources

The following resources will be needed throughout the year for my action plan:

- Laptop computers – school owned
- Personal laptop – mine or school owned; for my use
- Internet
- Websites that explore 4th-6th grade mathematic concepts; including – HotChalk and Brainingcamp and DiscoveryStreaming
- Software programs that explore 4th-6th grade mathematic concepts; provided by school
- Technology resources owned by school – document camera, digit cameras, projector, and any new resource that the school provides

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