TEACHER'S ATTITUDES TOWARDS TECHNOLOGY IN THE CLASSROOM

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Table of Contents

Abstract

There are many kinds of technology present in today's classroom, including computers, tablets and smartboards. These pieces of technology have the potential to allow content to be taught much more efficiently, introduce new skills in the form of handling technology and be several times more engaging and relevant to students of the next generation. However, history has taught us that the introduction of new tools, concepts and solutions often do not work very well in their first iteration. Change may be met with resistance because many of the "old guard" are distrustful of altering what they have been doing for their entire careers, particularly in the absence of clear research-based alternatives. As well, technology may have its own technical hurdles; new components may be incompatible with older pieces of hardware, new software may not function, may be unintuitive or it may be simply too new and difficult to use without extensive training. This study aims to see what several teachers in the Toronto and York region area thinks about using educational technology and how this may be implemented in their classrooms. Data analysis revealed four distinct themes in regards to teacher's attitudes towards technology: 1) age does not determine a user's perception of technology, 2) how comfortable a teacher is with technology will directly impact the integration of technology in their classroom, 3) when given a new piece of technology by the institution, training or instruction given to the teacher by the school often has little effect on the teacher's perception of that piece of the technology, 4) technology should invested in by schools as a curriculum tool, not solely invested in for the sake of appearing to be up to date with technology use.

Chapter 1 Introduction

"Almost from birth, children are immersed in a technologically rich world yet they often enter preschools that offer little to no use of technology… [And] the inclusion of technology also increased learning and encouraged children to socially interact through new media" (Estes-Del Re, 2011). Technology is ever present in our generation and making full use of these tools is becoming more necessary to engage and to teach essential skills to our students. Technology is all around us in all corners of life: computers, laptops, video games, cellphones, televisions, and even our cars are considered technologically "smart". Teachers are now faced with the challenge of teaching technologically-encultured students who grew up with technology literally from the crib, while attempting to instill traditional values and teachings from the previous generations.

Background of the Researcher

Being part of the Generation Y (1990's), I was fortunate enough to grow up with technology from a very early age. Specifically, my first interaction with a computer was with my parent's IBM Thinkpad laptop at the age of 3. Running away from the kitchen to the basement, I found the recently repaired laptop on the carpeted floor. My parents found me by listening to the distinctive clickety-clack from the IBM's Model M style keyboard. According to my parents I was glued to the screen, mesmerized by the results of clicking random keys and buttons. My interest in technology did not stop at the young age of 3. It still carries to this day as I have built several computers, repaired several laptops, cellphones, cameras and other pieces of technology.

I have also spent my first year in computer science, only leaving due to the large number of mathematics courses I had to take.

In my classroom experience as a teacher candidate, I have explored and incorporated technology in the classroom. It may range from a simple stereo speaker system to play recordings or a projector to put work or notes on the board, to complex systems of networked tablets, computers, wireless displayer adapters, Bluetooth speakers and other devices to allow students to collaborate and compose music together in real time using software instruments on the tablets.

However, one perspective on technology that I challenge is the use of technology for technology's sake. There are many examples of technology being used in a manner where it is actively inhibiting teaching and learning. Some cutting edge tools may not be compatible with current equipment, unintuitive, takes too long to use effective or is simply unengaging to students and thus may serve no purpose in the classroom (Gorder, 2008). I think teacher education and ongoing professional development is the most important focus for effective technology integration in classrooms to avoid technology being either under-used or misused without adequate training and experience.

Purpose of the Research Study

The research questioned posed for this research project is "What factors affect teacher's attitudes towards technology in the classroom?" The need for technologically literate teachers is becoming more and more important as technology progresses at an increasing rate. Computer chip technology is developing at astonishing speed, for example. Twenty years ago, most people would consider reading an email on a cellphone something out of science-fiction. Today, grade 2

students have access to the latest storybooks on their smartphones and tablets. However, in many classrooms, the technology is well past obsolete as desktops and laptops are far older than the students themselves and do not lend well to learning due to poor hardware or software. Some schools attempt to rectify this situation by purchasing the latest and the greatest pieces of technology out there, however, with insufficient training and understanding these pieces of technology quickly become discarded and its potential wasted. Therefore, by understanding the beliefs and visions of the technologically inclined teachers, schools may be better equipped to make decisions about using technology.

In order to make this study as inclusive as possible, I will be interviewing several different teachers of different subjects, ages, cultures and technological background. For teaching subjects this includes: special education, language arts, math, physics, history/geography and music. For age groups, I will be using 3 age groups: 24-35, 36-51, 52-64. The reason being that I believe this is a good representation of 3 different generations (those of the X/Y generation, those of the late baby boomers and those of the baby boomers). These 3 different generations have distinct cultural backgrounds with technology.

In particular, I am very interested in the use of cutting edge technology in the areas of special education and English language learning. This is because both areas involve the most concentrated use of resources per student. Through this study, I hope to find what makes these pieces of technology work, teachers and educator's opinions on these and how to better implement them if needed. Finally, I would also like to speculate on future technologies that maybe be utilized in the classroom.

Chapter 2 Literature Review

Preschoolers' Use of Technology in the Classroom

In the 21st Century, technology is introduced to children as soon as they reach the crib. There are examples of play pens equipped with speakers and a touchscreen for an infant's entertainment and two-way video monitoring quickly becoming commonplace. Recently, with the falling prices of tablets and handheld video game machines, these machines are falling into the hands of very young children. This results with children being much more technological adept at a much early age than the previous generations. This creates a discrepancy between the knowledge of teachers and students where teachers are used to using older technology while students are used using more cutting edge technology leading to disengagement in the classroom. This is even more apparent in the preschoolers' age group where traditionally there was little use for technology. The researchers in this study, Estes-Del and Darlene, make several cases for different methods to incorporate new technologies such as tablets into the day care program. One of the more interesting concepts brought up was the Montessori Method (Estes-Del Re, 2011)The Montessori Method is a student-driven learning environment where students placed in mixed age classrooms and given a wide range of options for hands-on learning. When incorporating technology in this method, students themselves would be allowed to choose which pieces to incorporate which engages the student in learning as they are using the items of their choice. The primary downside is the costs to implement as tablets, computers, and video games are generally extremely expensive.

Estes-Del & Darlene (2011) focus on how one might transform child care classrooms with theories and practical ideas. However, the main concern in the findings was the lack of time to implement such changes. As changes like this require an overhaul of the education system,

this would take several years to come to reality. As this study was very recent (this study was done in 2011), there was not enough time to show the changes to the system.

Confluence: Information technology in the Classroom

This is a relatively older work (I say relatively, since 2001 was only 13 years ago), however, there are many lessons learnt from this work. One of the big topics covered in this work includes the topic of change in the use of informational technology in the classroom. In this case, we can see if the intended changes (as it has been 13 years since this dissertation has been published) have come to any fruition.

Typing now can almost be considered an essential skill into today's technologically driven world. We now type assignments, essays, and dissertations to more mundane tasks such as socializing with one and another. Therefore, Bloomstone (year) found it relevant to integrate typing into Literacy classes. He reasons, "The pressure on schools to teach the skills necessary to prepare students for the future in this age of technology is growing (Hickox, 1997). Experts predict that most of the jobs that do not exist today will exist sometime in the future (Gates, 1996). These new jobs will require education past the high-school level. These jobs will require forms of technological training. Schools today are not preparing most students for the future (Harrington-Lueker, 1996). Changes are going to have to be made to keep pace with the global community." (Bloomstine, 2001). Throughout the dissertation, he gives examples of classes where typing is integrated into its writing components and the results are students who are technologically savvy. Thirteen years later, we can see the result of integrating typing into the writing component of English classes: students are savvier than ever and it gives them the essential skills of inputting information into a personal computer.

However, in his research, (Bloomstine, 2001)observes that students are often focused on the screens of computers, and therefore often distracted and disengaged from the classroom activities. He notes that, "What is interesting to point out is that SimCity involves options for participants to choose from, colorful graphics, an array of noises, and opportunity for two players. Students who were playing this computer game were glued to their computers." (Bloomstine, 2001). He reasons that a possible downside to such heavy technology integration may result in a generation of students only focussed on the virtual world instead of the real world. Unfortunately, many of his fears have come true as many people are constantly fixed to their cellphones, tablets, desktops and laptops; often forgoing real life socialization for online socialization.

(Bloomstine, 2001)gives an interesting insight to what may be the possibilities in the future of technology in the classroom.

Teachers' Preparation Needs for Integrating Technology in the Classroom

One thing that many schools lack is education for the teachers about how to use new pieces of technology. Tools are only as good as its wielder and if the tool is incorrectly used, results may range from inefficiency to complete destruction of the work. The same idea can be applied to using technology in the classroom. If a teacher does not know how to use the tools, they may waste time from attempting to troubleshoot the device, or worse, completely disengage the students as they see a teacher who does not know what he or she is doing.

In the United States, teachers generally are given only hour per teaching subject in professional development (Dynarski, 2014). This amount of time is generally not enough to

allow the teacher to be proficient in new technologies. "One-stop-shop professional development focuses on training teachers to operate computers and software packages instead of how to integrate technology in the classroom (Knapp, 1996; McCannon & Crews, 2000). This type of training is not found appropriate for meeting teachers' pedagogical needs and is too far removed from their day-to-day classroom practice. This type of training has yielded uninterested teachers and lack of teachers integrating technology in the classroom" (Jackson, 2013)

Jackson (2013) finds that one of the major issues throughout the United States is that school boards are quick to buy into the newest technologies available. However, as shown, teachers are provided inadequate instruction on how to integrate it into their classrooms. Thus, these advanced pieces of technologies are often sidelined for more tried and true technologies. He reasons that instead of spending huge sums on the latest devices, money should be spent on upgraded forms of the original technologies being replaced and the rest of the money spent on professional development. For example, if there were a computer with several PCs, instead of replacing them with Apple iMacs (requiring the teacher to be taught how to use Apple's OSX), the school board upgrades all the PCs for significantly smaller cost and train the teachers how to fully utilise the power of the new PCs. However, he mentions that there is no one-size-fits-all solution for preparing teachers to integrating technology into the classroom. Each situation calls for a unique solution, emphasizing a close relationship between the teacher and the administration.

Educational technology in the classroom from the teacher's perspective

This study echoes the sentiments of Jackson's (2013) study: Teachers want to integrate technology into the classrooms, however, they feel that they need better training in order to fully make use of the technology. Specifically in this study, he finds the use of desktops and laptops in the classroom sidelined for a number of reasons:

" lack of teacher comfort with computer and technology use

- belief that computers and technology are not necessary to help students

- lack of adequate training and support for computer and technology use in the classroom

- lack of desire for this use

- lack of computer access" (Roach, 2010)

Throughout the study, Roach interviewed76 teachers,in order to gather what many of them are looking for with technology. He found that teachers want:

"affirm student diversity and support differentiated instruction

- implement technology-supported authentic assessment

- evaluate the effectiveness of using digital materials

- collaborate with other teachers to share knowledge

- communicate with others (parents, caregivers, and administrators), and

- model technology use in the classroom" (Roach, 2010)

Why resistance? Elementary teachers' use of technology in the classroom

On the flip side, however, there are teachers that do not want to make use of technology in the classroom. Reasons include being entrenched in a personal teaching style that does not make use of the technology to complete lack of access to the technology. However, like in other studies, Himsworth (2007) found only 20% of the teachers interviewed are comfortable using technology in the classroom.

Himsworth (2007) takes it one step further in reasoning why some teachers are less inclined to use technology in their classrooms: age. Many of the teachers interviewed are on the verge of retirement, giving them decades of experience in the classroom. Several decades ago, such technology simply did not exist or were so expensive that it was out of reach of these teachers. Returning to the present time, several of these teachers feel that learning how to use technology in their classrooms makes little sense. Some reason that it costs too much money to implement a system, others argue that they are at the age where learning something so new is not feasible and finally some argue it is simply not worth the trouble as they are retiring in a few years.

Himsworth (2007) disagrees with these points, she finds instead that integration is a vital part of the classroom as our society is so heavily dependent on computers and electronics in this age. "Recommendations include encouraging teachers in their use of technology by developing a supportive educational culture that includes staff development with follow-up support and leadership that includes teachers in the decision-making process. The future of successful technology integration is dependent on helping each teacher develop a student-centered pedagogy, which, in turn, requires developing supportive learning communities for teachers and administrators." (Himsworth, 2007)

A Study of Teacher Perceptions of Instructional Technology Integration in the Classroom

Teachers teach students many skills with technology, yet there are many who are not very comfortable with it (Gorder, 2008). This study focuses on 174 K-12 teachers from South Dakota who have completed the Advanced Technology for Teaching and Learning course at the Dakota State University. Two of the primary questions asked in this study was A) How do teachers currently use and integrate technology for teaching and learning in the classroom and B) How do teachers differ in the extent to which they integrate instructional technology based on the characteristics of gender, age, teaching experience, grade level taught, content area and educational level.

What was found in the study was most of the teachers surveyed use many sources of technology in their work on a daily basis (Gorder, 2008). Examples of this include using software productivity tools, applying trouble-shooting techniques and demonstrating the responsible use of technology in the classroom.

When questioned about specifics about pieces of software, teachers are often found to be comfortable with productivity software such as Microsoft Office. However, some teachers are less comfortable with more complex software such as Adobe Photoshop and Audicity. This may be attributed to many of teachers interviewed use Microsoft Office on a daily basis compared to Adobe Photoshop and Audicity.

The study finds that there is no correlation between age and gender to determine how comfortable a teacher is with integrating technology in the classroom (Gorder, 2008).

Summary

Teacher's attitudes towards technology is an extremely broad topic, however, there are several themes that were discussed throughout this literature review. The most prevalent theme is that many teachers do want to integrate technology in some form into their everyday classroom, however, they feel that they do not have adequate knowledge on how to implement and maintain such a system. Schools should be investing in a teacher's professional development rather than just purchasing pieces of technology. School administrators should be in a close relationship with the teachers they are supporting with technologies as there is no one-size-fit-all solution to all technology problems in the schools. And finally, some teachers are also resistant to change in the classroom.

Chapter 3 Methods

This qualitative study seeks to find how technology (such as computers, tablets, smartboards, projectors and other tools) is incorporated into classrooms on a daily basis. The study also seeks the opinions on teachers who do make use of such technology in the classroom. Do they find it beneficial? Can there be improvements in the system? What in their opinion is the future of technology in the classroom? This study will also attempt to uncover the opinions regarding technology in the classrooms of school and system administrators.

Procedure

The main method of data collection in this study is to conduct a series of interviews with those teachers that make use of technology in the classroom as well as those who are school administrators. These interviews took place over a number of different schools over a period of several months. Specifically, at least one set of interviews near the beginning of the school year and one set near the end. This allows a balanced approach to collecting data as different points in the school year represent different sets of data to be explored. The interview questions can be found in Appendix A.

Participants

In order to make this study as inclusive as possible, I will asked several different teachers who represent different subjects, ages, cultures and technological background. For teaching subjects this includes: special education, language arts, math, physics, history/geography and music.

Data Collection and Analysis

The first round of data collection happened during early to mid-June. This will represent the time period near the end of the school year. The second round of data collection happened during mid to late September. This represents the time period near the beginning of the school year. Locations will vary, as there are high schools in North York, Ontario and elementary schools in Richmond Hill, Ontario that have graciously allowed me to interview teachers and school administrators

Each interview consists of a series of questions shownAppendix A (which are broken up into headings including, teachers and administrators). Interviews did not last longer than 30 minutes as time is precious to all parties involved.

All interviews were recorded using a microphone or recorder. Recordings were then transcribed using Dragon Speak software multiple times to ensure accuracy of the text. Data was then analysed to compare and contrast responses and to form patterns and useful conclusions.

Ethical Review Procedures

This study will follow ethical review standards provided by the Masters of Teaching Program at the Ontario Institute for Studies in Education. Before each of the interviews, research interviewees will be provided a letter of informed consent, which is to read and signed before being approved for an interview. One copy will be with the interviewee, while another copy is kept for the records of this study. Interviewees will be informed that they will have full

confidentiality in this study as their names will be altered for the sake of anonymity. Letter of consent is provided in Appendix B.

Limitations

There are several limitations to this study. First and foremost is the scope of the sample size. While, it will be possible to find a range of different age groups to choose interviewees, the pool of participants will be relatively small compared to other studies in the past. Other issues that may arise is the lack of time to fully observe how teachers use technology in the classroom and some school administrators may not have the liberty to explain their plans with future technology implementations.

Chapter 4 Findings

In this section of the qualitative research paper, I have included a brief introduction of the participants, whose names and the names of the institutions in which they work were changed to ensure their confidentiality. I later analyzed their interview statements and as a result 4 major themes emerged from their discussions.

Background Information of Participants

In this qualitative research paper, I interviewed 5 educators across 3 different institutions. To find these teachers, I talked to my associate teachers, colleagues and administrators from schools that I have volunteered before. As a result, I managed to find a relatively wide range of teachers of different ages, teaching subjects and backgrounds.

Tina

Tina works at Northern (pseudonym) Elementary School, currently teaching a grade 6 homeroom class. She has over 25 years of experience working with grades ranging from grade 4 to grade 9. Tina recently has been integrating smartboards into her classroom and is an avid user of technology in her personal life, as she is often seen with her smartphone and laptop. She is proficient in productivity software such as Microsoft Office and maintains a blog on her teaching.

Justin

Justin was recommended by Tina as another educator to interview for this research paper. Also working at Northern Elementary School, he is a relatively new teacher with less than 10 years of teaching experience. Currently he is teaching a grade 7 homeroom with grade 7 and 8 English Language Learners. When executing lessons, he primarily uses the whiteboard and seldom integrates technology beyond the whiteboard in his plans. He is an active user of technology in his personal life as his tablet and smartphone are are integral part of his daily routines.

Ron

Ron works at Southern (pseudonym) Elementary School, currently teaching a grade 2 classroom. He has more than 15 years of experience teaching grades from kindergarten to grade 6. Ron makes specific use of tablets in his every day lessons with many components written on whiteboards and chart paper. In his everyday life, Ron does not make much use of technology. While he does own a smartphone and a desktop computer, he claims he is not very proficient at operating either machine.

Shelley

Shelley works at Western (pseudonym) Elementary School, currently teaching grade 6 to grade 8 music rotary. She has less than 10 years of teaching experience. Her lessons typically include some forms of technology such as tablets, speakers and projectors. However, their use is dependent on the unit taught. In her personal life, she is very proficient with music notation

software such as Sibelius and Finale. She maintains a large number of computers for her recording projects at home and brings a laptop and smartphone with her to work.

Catherine

Catherine was recommended by Shelley as the final participant of this research paper. She teaches Grade 8 science at Western (pseudonym) Elementary School, with around 20 years of teaching experience. She makes extensive use of technology in her classroom, with most of her lessons integrating the smartboard. Laptops and clicker remotes are often used for independent work or class participation. In her personal life she is proficient with several pieces of software and maintains the school's inventory of laptops and tablets.

Key Findings

Analysing the statements made by the participants of this study, four major themes emerged:

1. Age does not determine a user's perception of technology. Some of the younger teachers are not comfortable with the technology they use while some of the other older teachers are very comfortable with the technology they use.
2. Teachers are far more comfortable integrating those technologies that they use in their personal lives within their classrooms.
3. When given a new piece of technology by the institution, training or instruction given to the teacher by the school often has little effect on the teacher's perception of that piece of the technology.

4. Technology should invested in by schools as a curriculum tool, not solely invested in for the sake of appearing to be up to date with technology use.

Theme 1: Age does not determine a user's perception with technology

The findings are in line with Himsworth's (2007) findings that age does not determine how comfortable a user is with technology. For example, Tina, who is approaching the age of retirement finds technology extremely useful in the classroom:

"The tech found into the classroom today is extremely useful. Last year, I've started using the new smartboard installed [at the back wall]. So that class were my guinea pigs! It was pretty hard at first because I was not used to moving things around the board like that, but I saw how fascinated the [grade] 6's were, so I've spent a couple of weeks playing around with it after school to learn how to properly use it."

Specifically, Tina has been using the SMART Notebook application to create interactive lessons for her students. What she has found is that by placing manipulatives for math on the smartboard, students benefited from the differentiated instructions. One example of this was teaching how to divide fractions. When asked how to create a reciprocal of a fraction, Tina flipped the numbers around with her hand to visually show how to flip a fraction.

Conversely, Ron's perception of technology is not as favourable as Tina's even though he is a teacher from a far younger generation:

"The tech[ology] is pretty cool. But one of the things I ask is 'why do we need it? Seriously, is it because it is cool, shiny and a huge distraction to the kids?"

Ron makes use of Apple iPad tablets in his classroom. Specifically he makes use of education games found such as *Math Ninja*, *Stack the Countries* and *Math and Letters Air Control.* However, he uses the iPads as more of an award for good behaviour or for completing classwork early instead of integrating them directly into the lesson. His perception is line with the findings in Estes-Del Re's, (2011) findings that children around the age 4-10 are extremely intrigued by the visual stimulation brought by electronic gadgets.

Overall, it is clear that age is not a determining factor whether an educator perceives technology as a useful tool in the classroom.

Theme 2: Teachers are far more comfortable integrating technology they use in their personal lives in their classrooms

The findings of this study are consistent with Gorder's (2008) findings that how comfortable a user is with technology will reflect how they use it in the classroom. For example, Tina, finds herself extremely comfortable using technology in the classroom:

"…This is what I carry every day: a Samsung S5 [android smartphone] and an iPad [tablet]. I regularly use Facebook and Gmail on the phone to keep in touch with friends and family and the iPad to watch Netflix. Not at school though [laughter ensues]. At home, I often log into [name of school board]'s intranet and maintain a blog."

When asked how she became comfortable with all these pieces of technology, she stated that she has a number of relatives who constantly introduce to her new pieces of technology, and provide support for them. She described how her grandson introduced her to the iPad when he visited her about a year ago. However, much of her expansive technical knowledge comes through asking her daughter and grandson to troubleshoot problems such as Wi-Fi connections

and installing and removing apps. Tina brings this knowledge and comfort level to the classroom as she integrates tablets and smartboards into her lessons on a regular basis. She allows students to use their own technology when needed and even helps them troubleshoot problems when they arise.

Ron on the other hand is not extremely comfortable with certain pieces of technology. He states:

"Yeah, I do carry an iPhone, but it's really just there for calling and texting. All the Facebook and Instagram stuff, I don't really use them. I also got a [desktop] computer at home, but it's used for email and marking mainly. I don't really game or do that kind of stuff."

Ron's aversion towards many forms of technology stems from the lack of exposure when younger. He talks about how until university he used a desktop computer as his only source of computing technology. Because of this, he claims he has trouble adjusting to new computing products. This is reflective in his classroom as his students only see technology as a form of reward.

Theme 3: When given a new piece of technology by the institution, training or instruction given to the teacher by the school often has little effect on the teacher's perception of the piece of the technology.

In many cases, teachers are often given pieces of technology to use in the classroom. Usually, these new pieces of hardware are accompanied by some form of instruction or training, typically via a workshop during a Professional Development day or by a colleague/IT professional in the school (Jackson, 2013). The findings in this research study is consistent with Roach's (2010) findings, where instruction given within the school has little impact on how a

teacher perceives a new piece of technology in their classroom, because teacher's bring their own bias when handed new hardware, and this prior attitude is largely not addressed through training efforts.

Shelley is avid user of music notation and digital audio workstation (DAW) software. She makes use of them and other audio related technologies in her personal life:

"Whenever I get the chance… which is never [laughs]… I try to write whatever musical ideas I have in my head. The way I used to do it when I was still in university was having a recorder. Now, I have a keyboard and pad hooked up to my [Apple] iMac to record whatever ideas I have. Did you know you can load up Garageband [DAW] on your iPad and record straight from there now?"

During her compositional unit, Shelley was given a number of Apple Macbook computers loaded with Garageband. An IT professional hired by the board gave her some instruction on how to use the laptops, however, her opinion of the instruction was fairly negative, in part because she appeared to already have more experience than the supposed trainer:

"Guy definitely didn't know what he was talking about. Obviously you can't connect the Apogee Duet [a microphone and instrument input device] with a Firewire port when the new Macbooks don't even have the port! Poor guy, probably thought I was an idiot or something since I kept telling him it wouldn't fit. So would you say his training mattered? Hell no, it was beyond useless since I pretty much knew how to operate a Macbook already. Really all I wanted was to get to the kids and be on my way. Why the [Western] board wastes so much money on this training is beyond me."

Catherine is also a heavy user of technology in her classroom. Students regularly make use of laptops and clickers in her science class. Recently the school installed a smartboard in her classroom. However, despite the number of workshops she has attended, she does not feel that the smartboard is a useful tool in the classroom:

"I don't like smartboards, don't get me wrong, they're amazing pieces of technology. But, I don't think they're ready for the classroom just yet. Too many problems right now with lag, precision and connections. I've went to a bunch of [Western] board workshops and every time, they've been saying how cool they are, but when in action it's simply a glorified whiteboard."

In Catherine's perspective, the use of the smartboard is limited as she views it as an ineffective replacement for her whiteboard. As much as the workshop's facilitators try to persuade her, her bias against smartboards leaves them unused in the classroom.

Overall, then my data illustrate how the teacher's opinions and bias plays a huge role in how they perceive a piece of technology that is being offered to them.

Theme 4: Technology should invested as a tool, not invested for the sake of technology

The final theme of this research paper examines the rationale for investment in educational technology. When interviewed, teachers all agreed that technology is a tool and should be treated as such. Because of that, some teachers prefer to use certain pieces of hardware compared to another teacher.

Justin has a lot of experience with technology as he was exposed to computers from an early age. He employs a lot of technology in his personal life:

"I do keep a[n Android] Nexus 9 and a [Sony Xperia Android] Z3 phone with me when I go to work. As entertainment devices, they are the best as I can stream movies and Youtube to the projector using [the Miracast receiver]. As productivity devices, I can email other teachers, admins and parents and also edit student's homework if they upload it to [Google] Drive. At home, I am the 'tech guy' who's in charge of anybody's problems."

Justin, however, does not??make use of the smartboard in his room, nor access the iPads and laptops that are available at the library. He sometimes streams Youtube and movies as a reward to students. His reasoning is as follows:

"What's the point of having all the latest things when the whiteboard does the same thing? In many cases smartboards and computers are amazing tools, but in the context of an ELL class, how much better would they be to help my students learn English?"

Justin and other teachers see technology as a very useful tool. However, when not utilized properly, they see them as getting in the way of students' learning.

Summary

Every participant comes from a different background and different teaching subject. Each participant has different personal perspectives on how they use technology in their daily life and their professional life. However, as it has been illustrated in this chapter, there are many common themes that were observed in the interviews with these educators. Each of them provided valuable insight on what factors influence a teacher's attitude towards technology

Chapter 5 Discussion

In this chapter, I hope to share my growth and reflections of the course this research project as a researcher and educator. I will be exploring my themes and the limitations of this research project and areas of further research.

Reflection

As I went through my journey as a researcher, many thoughts went through me over the course of this research project. As an educator who loves the bleeding edge of technology, I wanted to see and explore the implications of using technology in a diverse range of classrooms.

There is not a "one size fits all" solution to whether an educator should use technology in their classroom. As evidenced in the Chapter 4 and the findings of (Roach, 2010), teachers bring their own personal background and bias into the classroom. A teacher may be heavily influenced with the pros of using technology in the classroom, while another may not be so keen on using it. Factors such as how comfortable a teacher is with technology, their experiences and perceptions all play an active role in their attitudes towards technology in the classroom.

Another key factor is the subject and grade the educator is teaching. For example, Justin found that smartboards are not effective tools in his English Language Learners classroom because he feels he can be just as effective using a whiteboard without the need to worry about imprecise calibration and input lag with smartboards. However, Shelley find technology tremendously useful in her music class as it allows students to engage in compositional activities

in an approachable manner which was just a dream in the earlier age of stave paper and pencil (Gorder, 2008).

Another common theme throughout this research paper was the teacher's aversion to accepting training for the various pieces of technology given to them. This is one area that I was unprepared to explore as I had little experience with technology workshops given to teachers during Professional Development days nor worked with one of the school board's IT professionals. However, what I gathered was that the participants have not found the training given to them very useful. They found it much more useful to ask their colleagues, friends and family for technical support.

In my personal journey as an educator, I have found the use of technology as a challenging issue. I love playing with the latest gadgets and trying to incorporate some of them directly into my teaching. Recently, I have been experimenting with hooking up a Miracast receiver to a projector in order to wirelessly display my Microsoft Surface tablet on to the wall. This allows me to treat my tablet as a handheld whiteboard, being able to write, sketch and manipulate words, pictures and objects while being mobile and not confined to the front of the classroom. This allows me to roam around the classroom so I can effectively teach, help students and keep watch over ones who are not paying attention. However, I must also watch out that I do not apply technology in the classroom simply for the sake of using technology in the classroom, rather than with a clear instructional purpose in mind. Why spend resources and time implementing a system in which traditional pen and paper may do just as well? A balance must be struck.

In the end, I find all the different educator's opinions on their attitudes towards technology in the classroom very illuminating.

Limitations

Over the course of the research project, I have gained different insights about how teachers viewed technology in the classroom and myself as an educator. The end goal of this research project was not to come to any conclusions about teacher's attitudes towards technology nor impose my bias of technology onto other educators, but to reveal what other people in education think about the different technologies in their classrooms. However, despite my best efforts in this project, there are several limitations.

As said previously in Chapter 3I had a limited sample size, limited time, and my personal bias towards technology. Specifically, interviews were only conducted in the second year. This short time window also affected the number of participants for the research project as originally I had eight potential interview participants near the end of the first year, however, by the time I conducted interviews my limited time only allowed me to interview five of those participants.

My bias towards this topic is a limitation to this research project. As an educator who is pro technology in the classroom, my assumptions, beliefs, values and experiences may have influenced the way the data is analyzed and interpreted.

Further Study

Out of the four themes generated by this research project, one theme that could be studied further would be the theme of how effective school based training is for teachers. As evidenced by chapter 4, very few teachers appreciate the training they are receiving for new technology in their classroom. I believe a lot of interesting questions on why it may not be effective such as teacher's attitudes towards Professional Development days and the training they receive may be an interesting research topic that could be addressed in future research.

Summary

To conclude this research paper, I would like to end with a quote from Justin, "Technology is a great enabler. It makes information more approachable and brings the world to your fingertips. But just remember that same enabler also drag you away from the world."

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Appendix A1 Questions for teachers

1. How long have you been teaching?

2. What age groups are you teaching?

3. What subject areas do you teach mostly?

4. What technologies do you use personally in your life?

5. In your classroom, what kind of technologies do you use on a daily basis?

6. In your classroom, what kind of technologies do you on a less regular basis|

7. Can you explain your reasoning behind using [this piece of technology]?

8. Have you had any issues with technology in the classroom? Hardware issues? Software issues?

9. If there was one thing you could improve with the technology you use in the classroom, what would it be?

10. For any board given technology, was there any training involved? Did you like the training?

11. Is there some technology you would like to use in the classroom? What is currently holding you back from using it?

Appendix B Letter of Consent

Letter of Participation and Consent   Date: [Date]

Dear:[Name]

      I am currently a graduate student enrolled in the Master of Teaching program, at OISE, University of Toronto. I am studying the use of technology in the classroom and its impact on student learning.

      This research study will involve conducting a 15-30-minute interview that will be tape recorded in which questions relating to what kind of technology is being currently used in the classroom and your opinions of its implementation and future uses. Interviews will be conducted at a time and place that is most convenient to you.

      The contents of this interview will be used solely for this research study in which a final paper and presentation will be completed. Your name and institution will not be used in the final paper or presentation. It is important to note that all information provided will be confidential and if you so choose to omit certain aspect of the interview, you will be accommodated.

      If you agree to participate, please sign the form below. I greatly appreciate your participation in this research study.

Sincerely,

Paul Chow

Pauld.chow@mail.utoronto.ca

I acknowledge that the content of this research study has been thoroughly explained to me and

any questions have been answered. I understand that I can withdraw from this study at any time

or request to omit certain aspects of the interview.

I have read the letter provided by Michele Ferraro and have agreed to participate in the interview

process for the research study described.

Name (Printed): _____

Signature: _____

Date: _____