Information and Communication Technologies: An Examination of Pedagogical Practices in the Context of Video Game Learning

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The undersigned certify that they have read, and recommended to the Senate for acceptance, a **MASTER'S THESIS** entitled:

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Submitted by: **Leo Landers**

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Abstract

Substantial investment has been made by the institution of education in Information and Communication Technologies (ICT) in the belief that skills in ICT are critical tools for the work force of the future. Video games are an important part of this new field and yet they seem overlooked by current pedagogy in the classroom. In order to build a case for inclusion of video games in achieving core curriculum outcomes in the classroom, current traditional pedagogical practices of teachers are compared in the classroom and the computer lab. This is done to find out why video games are not used more often to achieve outcomes by teachers. The data in this qualitative case study consisted of interviews, a focus group discussion, and field observations made by myself. All discussions were transcribed and a thematic analysis was utilized to find common understandings from the transcripts. Final conclusions from the data analysis point to the reasons why video games are not used by the teachers in everyday classes. One major point was that teachers were trained in a rote learning environment which dictates they control all learning in the classroom. During the study when the teachers used the video game platform their pedagogy did not change to adapt to the different learning environment presented by having the video game in control of the lesson. This point and others revealed in the study show how teacher pedagogy must be flexible enough to adapt to new learning formats and more importantly the teachers must be conscious of their pedagogical practices to allow them to change from the conduit of knowledge to one of a facilitator.

CHAPTER ONE

Introduction

Imagine ……if we as educators could find the right combination of educational software and gaming entertainment and harness it for the good of education. Students could have fun while learning in a free-to-make-mistakes environment within a learning community designed to teach ways of doing and knowing related to a specific career. Vygotsky (1978) said

> pleasure is not the defining characteristic of play, because there is so much more going on in the cognitive and affective learning domains that needs to be recognized by curriculum developers that include non-cognitive skills like socialization, motivation, attitude, and control of behavior. (p. 92)

Players go through the process of constructing knowledge from their game experiences and from that develop competencies in the ways of knowing and doing within their selected learning community. This allows them to proceed further into multi-player games or their own chosen virtual worlds.

The study explored video game learning and corresponding pedagogical practices. These practices need to be researched and given educational status so gaming can flourish within mainstream core-curriculum practices. Standing in the way of the video game platform used to achieve this goal is the institution of education; a place where change happens very slowly. Warlick (1999) describes this institution as:

> It is run by parents, boards of education….Very few of these people are trained educators, but they are all experts on what schools were like ten, twenty, thirty, or forty years ago. There is enormous momentum to keep schools the way that they were (p. 17).

It is in our human nature to naturally resist change and this quote puts into perspective what a video game learning platform is up against not only in curriculum matters, but in the traditional classroom used by a typical teacher. Most teachers do not have a lot of free time to learn new pedagogical practices that do not yet have proven educational value.

As a working teacher, I have wondered if there was any educational value in video games. Does learning always have to be hard work or can you play and learn at the same time? Before I started this thesis I have watched in amazement as five and six year olds quickly learned to manipulate an iPhone and play video games such as Angry Birds. I do not claim to know what skills they were learning, but their ability to self-correct, reflect, and advance with prompts from the video game told me something interesting and educational was going on. I am also continually amazed by how video games can hold the attention of some students who have different afflictions such as mild Fetal Alcohol Spectrum Disorder, Attention Deficit Hyper-Activity Disorder, or Attention Deficit Disorder for hours at a time.

Ward (2000) expands on research done by therapists at the Eastern Virginia Medical School who are using video games and biofeedback to treat learners that are hyperactive or have an Attention Deficit Disorder. These learners thrive on the visual, auditory, intuitive, and tactile experiences presented to them by interacting with video games which show up in the biofeedback analysis.

Educators often expressed disbelief when I approached them with the idea of connecting pedagogical practice, curriculum outcomes, and video games. I noticed during my research that my participants felt very strongly that the lecture, study, and test platform allowed them to maintain control of successful learning within their classroom. My colleagues tended to be amused at the thought of video games being anything, but a waste of time. Others who were

more open minded seemed to be more willing to give video game learning a try, but did not have any idea of existing best pedagogical practices or how to go about pushing the concept of video game learning forward in their classroom or in the computer lab.

This is where my fascination with the concept of connecting pedagogical practices with video game learning and curriculum outcomes started. I am a non-gamer who does not own any video gaming equipment and does not play any video games at all, who sees this study as an opportunity to build a foundation for including video games in my pedagogical practices in the future. During my research I have read video game learning theories from authors such as Bonk (2009), Gee (2005), Prensky (2008), and Schaffer (2005) whom all believe with technologies advancing so rapidly, there is room for change within the current education system to allow some form of video game learning in the classroom. These theorists are convinced that the dawn of video game learning is upon us. Bonk (2009) writes "the reliance on eyeball-to-eyeball learning, which has been persuasive since Plato's Academy, two dozen centuries ago, is no longer as prevalent in schools, universities, and corporate training institutes" (p. 12). Education learning theories must eventually evolve and mirror the new technological society it serves. It seems to me current traditional pedagogical rote learning model is teacher-centered, which is a one-way educational relationship with the teacher controlling the student's learning experience. Video game learning on the other hand is student-centered and moves more of the responsibility of learning and reflection on the student.

The research of video game learning at first glance points to a three point model, (student, teacher, and video game) with the video game lesson being student-centered and the teacher's role changing to one of a facilitator. The student-centered model in the video game format uses games or real world professions which come together as learning communities. This

can be a very good learning environment for students. These communities use the ways of doing and thinking used in the everyday work environment that allows the learner to put a real value on learned content. Digital technologies that are so embraced by an entire generation of students should not be overlooked as a teaching tool. Hopefully these technologies can be harnessed to compliment good pedagogical practice already in the classroom. My hope is eventually the forward thinking digital generation of today will be more open-minded and allow video game learning to be used to its full potential.

Research Questions

The purpose of this study was to examine teacher perspectives when comparing video game learning to traditional pedagogical practices within the classroom. The following research questions kept me focused on specific issues related to the teachers' current pedagogical practices and drove the research forward.

1. What are teacher perspectives of their pedagogical practices when comparing video game learning to traditional pedagogical practices within the classroom?
2. In looking at engagement levels during both lessons, what lesson really engaged the student more and had them illustrate higher engagement levels? Why?
3. What skill sets do students use and learn while playing video games?
4. Were the teachers cognizant of their role during the experience?

My reason for using these research questions was to build an understanding of the traditional teacher's perspectives of their pedagogical practices that they were using in the classroom. It was also to compare these practices to ones used when teaching with the video game learning platform. Because video game learning is such a different learning platform from rote learning, whole new digital skill sets (e.g. visual, intuitive, tactile) for digital learning have emerged from

current research (e.g. Bonk, 2009; Gee, 2005; Prensky, 2008; and Schaffer, 2005) which enable not only sequential learners to be successful but abstract learners as well. A thematic analysis was then performed from all the information gathered during the interviews and the focus group discussions. Then, I identified common themes that emerged from the data.

Importance of Study

We have come to the point in the development of video game play which opens up new horizons for education to embrace video games for classroom use. Research into the field of Information, Communication, and Technologies (ICT) has in the past focused on topics such as "Barriers That Teachers Face Using Digital Texts in the Classroom" (Honan, 2008), which focused on computers and literacy in the classroom. Other one-year research studies like Power and Thomas (2007) "Classroom in Your Pocket?" looked at the quality of teacher training using laptops to improve classroom instruction. Teacher technical capabilities using ICT by Waite (2004) created research about aims and uses of ICT in primary schools for literacy activities. These studies looked at the need for pedagogical change within the classroom in some way using ICT. This ICT study is no different in its quest to tie classroom pedagogy to video game play. It is important to remember during the course of this study, it's not any particular type of video game using role play or themes it is the fact that during the process of playing a video game a student is learning.

Now, it is important to conduct studies like this one that establishes the benefits of using video game playing and learning in the classroom. In order for teacher pedagogy to evolve into something better, it must recognize what it is working with and where it should be going. This study looks at the very real possibility of video game play moving from students' bedrooms into the classroom. Research into the function video game play and learning within the classroom is

limited to a few authors (e.g. Bonk, 2009; Gee, 2005; Prensky, 2008; Schaffer, 2005). With the publishing of their ideals of systemic student engagement in virtual interactive worlds of video gaming, alternative pedagogies, and uses for technology within the classroom the need for research like this is done to measure the advancement of good pedagogical practices to stay ahead of student engagement is very important.

Successful delivery of curriculum outcomes can come in many different shapes and sizes that should not be dismissed because they do not fit neatly into a book or on the chalkboard. As Merriam (1988) expressed in viewing the very critical need for educational research as "case studies are needed in order to gain an in-depth understanding of the situation and its meaning for those involved" (p. xii). More research into the field of video gaming could help us understand the best pedagogical practice that goes along with it. Education, in general, has evolved very slowly over time, while other major industries in the world have changed significantly (Prensky 2001b, p. 2). This is all the more reason for studies such as this to be undertaken.

Collins and Halverson (2009, p. xiv) comment on this very topic as they see technology being kept on the periphery of schools as past practice is hailed as the educational model to be followed. Over time, technology has transformed our society as a whole, but it has yet to become central in the classroom to teach reading, writing, calculating, and thinking (Collins and Halverson, 2009). This study responds to the need indicated by Collins and Halverson by investigating the benefits of using video games in the classroom.

Historical Context

The reputation of video games held by popular culture within North America was one of pure entertainment with people never really looking at the educational potential of the video

game itself. It is important to look past this reputation and realize the educational value of good video games that contain situational context learning within core-curriculum subject matter. The educational outcomes of situated learning communities within virtual worlds create powerful learning opportunities for the new generation of learners playing the games. Prensky (2001b) in his article "Digital Natives, Digital Immigrants" says, "Our students have changed radically. Today's students are no longer the people our education system was designed to teach" (p. 1). Prensky expresses that current students have spent their entire lives digitally interacting with television; cell phones, internet, and video games. They are different from other generations and pedagogical practices should be adjusted to take advantage of these unique characteristics.

Gee (2009, p. 9) uses the term "situated cognition" (i.e. thinking as tied to bodies that have experiences in the world) to describe human learning that is not just what's going on in a person's mind, but is fully immersed in a material, social, and cultural world. The video game learning platform offers that deep tissue learning experience described by Gee that immerses the participant within the experience.

Situating Myself Philosophically and Professionally

In order for the readers to better understand me in relation to my research topic it is important that I step forward from my research so you can clearly identify my bias as I approach the research. I am a late bloomer by educational standards, in my forties, and have been teaching junior high for nine years. My educational philosophy is such that I believe in giving as much control to the learner in my classroom as they can responsibly handle. In my ideal classroom, learning would be student-centered and playing video games (one of my teaching tools) would reveal another avenue of new learning that in my view has not been fully understood or appreciated by current educators. Of all the things I've learned about teaching during my tenure,

the most important thing is knowledge is not simply passed down from teacher to student, the student must actively engage in the learning process to learn from their mistakes. In short, they have to want to be there. Most players of video games do not know that quality educational video games create learning opportunities for learners to engage in different ways of doing and thinking while in a safe-to-make-a-mistake learning community. By using the term learning community, I mean a place where a group of people pursue the same goals using the same ideals and terminology to individually or as a group achieve those goals. The question this study is asking is, "Is pedagogical practice keeping up to this new learning platform?"

I believe that traditional education and progressive education pedagogical practices have strengths and weaknesses. Both are essential in a well rounded educational experience for the learner. I also believe learners need pedagogical practices which use a philosophy of experience where the environment (social constructivism) allows for either parallel or linear processing of information as a basis for use with new learning opportunities. As a student of curriculum, I can clearly see the relevance of using a video game platform for learning in core-curriculum areas. I do not claim to have the secret formula that solves all problems within the education system, but I do know video games put forward a strong argument that they can teach learners new ways of doing and knowing in a learning community and need to be added to core-subject curriculum.

As a teacher, I have always been eager to explore the world of curriculum and ask the question why? If a new pedagogical paradigm shows up at my classroom door tomorrow, I would try it to see if the students can get any educational value out of it or maybe improve on my own pedagogical practices. This is why I have attached myself to this issue of video game learning and the question of pedagogical practice that goes along with it. I am a grade seven teacher with a fascination for computer software that can hold a child's attention for literally

hours at a time and gets them to go back for more. As an educator I recognize educational video gaming as a very powerful tool that needs to be in my pedagogical tool kit. The students are learning content by focusing on virtual reality worlds, which allows the brain to think in different ways (linear or parallel processing) that helps players look at other situations differently. Johnson (2005) writes, "…it's not what you're thinking about when you're playing a video game, it's the way you're thinking that matters" (p. 40). This type of systemic thinking is what video game learning is all about. Video games open doors for learners of all types (e.g. visual, tactile, audio, etc.) to be successful. I find the concepts of Bonk (2009), Gee (2005), Prensky (2008), and Schaffer (2005), on systemic learning while playing video games very engaging. I enjoy trying to understand where the authors are coming from in an academic sense and what the true destination of their concepts on the video game learning platform evolves into.

Definition of terms

The following definitions may be useful in understanding this study and will clarify specifically how I considered these terms within the context of my work.

Video Gaming. Throughout this study many variations of video games are discussed such as multi-online games, theme-based games, and educational games. Within the research context students in this study used the educational video game Ice Cream Talk: Nouns and Verbs to represent video gaming. This game was chosen to represent the construct of play which is critical to the study of learning while playing video games through-out this study. This particular game was also chosen as it was free online and all students could access it at once.

Information and Communication Technologies (ICT). ICT is an interchangeable term used in this case study to identify any electronic technologies used in any descriptive context.

Video games easily fit into this category and are viewed by many researchers mentioned in chapter one as part of the technology revolution around us.

Mainstream Core Curriculum. When mentioned in this case study is looked upon as the core subjects taught in the classroom. These subjects include Mathematics, Language Arts, Social Studies, and Science covered in a Manitoba classroom (www.edu.gov.mb.ca/k12/curriculum). The video game chosen matched the lesson plans being used in the classroom by the teachers in this research study.

Assumptions

My assumptions are three-fold. First, the teacher has a virtual monopoly on power within the classroom and decides which type of pedagogical practice is used to deliver the lesson plan. Sequential learners thrive in the traditional pedagogical practice of lecture, study, and test. Students with other learning styles, however, such as abstract learners struggle outside this pedagogical box.

Secondly, my assumption of the participants' general lack of familiarity with the video game world may obscure the way they interpret success. They may be intimidated by the technology and therefore less likely to use it. To truly appreciate the video game learning platform the teachers within the study were encouraged to log some playing time with the students. My hope is that they might discover within themselves what they have learned during that time of virtual world playing and hopefully transfer that knowledge to pedagogical practice during the case study.

Third, the perspectives that I gathered from the participants offer an answer to my research questions. Their opinions were from their personal worldviews and reflected their own

truths not to be changed or misconstrued. The common understandings developed from the analysis represent the perspectives of the participants in the study.

Delimitations

This case study used the perspectives of three teachers on their pedagogical practices who participated in the study as the study did not have ethical permission to use student's opinions. Single teacher perspectives from interviews were used and also group perspectives when the teachers got together for a focus group discussion. Data gathered for the study was from my observations and from teachers' reflections of one classroom session and one computer lab video game session consisting of three games. Curriculum outcomes covered by the game mirrored current outcomes being covered in the classroom by the participating teachers.

Limitations

One of the main limitations was the fact the teachers were not comfortable with the technology. This had the effect of the teachers not giving up control of the lesson by not allowing the students to truly learn from the video games. Instead the students were only allowed to practice outcomes already delivered by the teachers in the classroom setting. This pedagogical practice had an unanticipated effect on the study as even the teachers did not get to experience the kind of video game learning I had anticipated.

The computer skills of students and teachers were also an uncontrolled variable as the teachers' computer skills were data process based and the students' computer skills were video game based. Although the design of the study sought out teachers with limited computer skills to reflect the typical classroom teacher, the participants ran into trouble dealing with software surprises in the computer lab.

Another limitation was the ability of participants to interpret their experiences. The transcripts contained broken sentences and hesitations by the teachers which illustrated the difficulties of articulating their thoughts. Different worldviews of pedagogical practices by the teachers and myself can change the interpretation of data gathered, so I had to be sensitive to where the teacher's thoughts were going when listening to answers to the questions.

Finally, the size of the case study was small. With only the perspectives of the three participants and myself the study was limited to these worldviews. Although small it makes information found all the more important when all of the participants are unanimous in their opinion of a certain conclusion.

Summary

In Chapter One I introduced the topic of using video games to teach curricular outcomes in the classroom, outlined the importance of the study, explained my personal context, and delineated my assumptions, delimitations, and limitations. Now, I need to bring evidence forward to explain the pedagogical differences of teacher-centered learning vs. student-centered learning within the video game playing platform and the classroom. Although teacher pedagogy is very important in this study the construct of "play" by the students and the skill sets they use during this state are also important because they should go hand in hand in the classroom. By comparing the two, the study hopes to influence future pedagogy to take advantage of these digital skill sets the students are using to learn. In order to do this the study identifies these skill sets in the literature review to show how students learn during this state of play. Viewpoints by teachers being reflective on their current pedagogical practice are also used to see in which direction classroom pedagogy needs to go to take advantage of this new digital learning platform.

Organization of the Thesis

Within the literature component of this thesis, the next chapter explains how the place and meaning of video game digital skills interface with the experience of education within the cognitive and affective domains of learning. The second chapter also discusses what skills learners develop while playing video games and how these learners discover new ways of doing and thinking within the-safe-to-make-mistakes learning community offered by video games. An argument is made about how video game learning uses transformational technologies that can literally change the pedagogical paradigm within the classroom. The third chapter examines the methodology of the qualitative study that describes the process of building the study. Chapter four contains information on how the data was gathered and organized before it was interpreted. The fifth and final chapter puts forth the information found and connects the common points in order to show an understanding of the research into classroom pedagogy.

My treatment of this topic ends with a conclusion in which I review the thematic analysis and summarize my thesis, and raise other issues and questions. These questions are beyond the topic of my thesis, but do merit discussion as they are related educational issues. Finally, a few suggestions are given that might help to facilitate change within teachers pedagogical practices that would improve the chances of inclusion of the video game learning platform while trying to achieve core curriculum outcomes.

CHAPTER TWO

Literature Review

Chapter two explains how the place and meaning of video game play can interface with pedagogical practice in the classroom using not only the cognitive domain, but also the affective domain. The digital skills that were selected best reflect how these skills can be used with different learning opportunities presented during video game play that require values, skill sets, and ways of acting, thinking and doing by the learner. Video game play can create a new platform for learning, which points to a different pedagogical paradigm needed within the classroom to take advantage of the learning opportunities. This new pedagogical platform gives the stakeholders new roles within the classroom by going from a two way teacher student model to a three point one of student, teacher, video game which gives more control of the learning to the student, but leaves the assessment of learning to the student's peers. I believe video games give players a feeling of empowerment over their own learning, while also offering a sense of belonging to something bigger in terms of working in a learning community. The chapter ends with a discussion of how video games create a safe-to-make-mistake learning community environment that requires different skill sets from the different learning domains of cognitive and affective learning.

Recent Studies of Video Games in the Classroom

Several recent studies have investigated the use of video games in classroom learning. Habgood and Shaaron (2010) considered intrinsic motivation while playing video games. The study looked at engagement of learning and how it must come from the individual. They claim the "concept of intrinsic motivation lies at the heart of the user engagement created by video games" (p. 1). This thought runs parallel to my research study, but mine looks at game play and

pedagogical practice within the classroom and how game skills can affect pedagogical practice by getting the teacher to require students to use these skills to achieve desired outcomes.

Digital literacy is an important topic brought forward by Steinkuehler (2010) in which he says "video games are narrative spaces that the player inscribes with his or her intent" (p. 61). His study focused on students developing their own story lines and sharing them with their peers. This study looks at the ability of the learner to interpret the prompts and make the right decisions to move forward in the game and what pedagogical practices the teachers uses to facilitate learning.

Jackson (2009) discussed the fact that video games use techniques similar to those used in the classroom. One of these practices (differentiated instruction) was "the ability of the game to adjust to the levels of individual learners" (p. 292). This mirrored current pedagogy. Jackson (2009) argues that players build their own knowledge structures as they play. He challenges teachers to find ways to use that concept within their pedagogy to the benefit of both learner and teacher. These studies mentioned are very relevant to this study as they support the argument of there is definitely educational value in playing video games and they confirm that teacher pedagogy needs to evolve to include the knowledge that can be learned from video game play.

New Ways of Doing and Thinking

The skill sets I looked at during the course of this study that helped to explain the how and why students learn in this learning paradigm are:

1. Multi-threading
2. Patterns
3. Focus
4. Social interaction

5. Problem solving

The above list of skills to be studied covers different learning opportunities requiring different values, tools, and ways of acting and thinking by the learner. I think it's very important to establish at this point what learning domains these skill sets are coming from and why they were chosen to build support for changes in pedagogy in the classroom.

Better Models for Learning

Literacy with ICT across the Curriculum (Education Manitoba, 2006) requires educators to teach skills that are from different learning domains (cognitive, affective) with the first domain covering comprehension, analysis, and evaluation, and the second domain allowing the learner to become more aware, developing beliefs, and values they use in everyday life. Shaffer (2006, p. ix) discusses how ultimately learners must evolve and transform themselves several times over their working lifetime career in order to be able to earn a living. Shaffer explains that to function in today's world, learners must come to the realization learning is not about remembering all the facts about something; learning is about understanding how things really work in the world so you can apply that knowledge to everyday problem solving. Once the ways of doing and thinking are understood, the learner becomes a more productive member of the experience, which gets them ready for a lifetime of employment.

Extensive research has been done with Information and Communication Technologies (ICT) by curriculum developers across Canada. Manitoba Education's *Literacy with ICT across the Curriculum* (2006) is an example of comprehensive ICT curriculum outcomes that could be reached by using the video game learning platform, but video gaming is not mentioned at all in the document. The platform of video game learning needs case studies completed that focus on the new pedagogical practices video gaming can bring to the classroom. If more research is not

completed in the field of video gaming, this learning community will continue to be viewed within the classroom as entertainment and not be given a chance by educators to be developed into a new platform for student learning.

Motivation

Prensky (2001) recognizes the moral attributes needed to play video games as the very sought after virtues our society holds in high esteem. Normally motivation, Prensky argues, comes from external factors such as rewards or punishment that do not work over the long term as the rewards need to become larger over time to motivate the learner. When you watch people playing video games and ask the players the question "where do you get your motivation to play video games? They will quickly tell you it's from within themselves" (p. 14). Prensky identifies with their desire to play the video games. Video games bring together a combination of motivating elements players feed off of that are not found in any other medium. Prensky (2001c) describes these as:

1. they are fun = that gives pleasure
2. they are a form of play = that gives us involvement
3. they have rules = that gives a structure
4. they have goals = that gives us motivation
5. they are interactive = that gives us ways of doing
6. they are problem-solving = that gives us ways of thinking
7. they have feedback = that gives us learning
8. they have interaction = that gives us social groups
9. they create winners = that gives his ego gratification
10. they have conflict = that gives us excitement

11. they have characters = that gives us new identities (Ch. 5, p. 1).

All these factors contribute to motivating learners to play long, complex, and difficult video games that can go on for 60-100 hours of playtime, some go on even longer. Last summer, my friend played the Super Mario Game for a month to rescue a princess in a castle. When I asked him why he played so long he said he played the original version as a kid and loved the new digital graphics and sound track. In short, the game just obsessed him to continue playing.

Video Design

Good video game designers create virtual worlds that contain learning communities for players to apprentice in and learn from new ways of doing and knowing in a safe-to-make-mistakes environment. Gee (2005a) puts game designers in a good perspective as he describes what they can do: "Game designers can make worlds where people can have meaningful new experiences, experiences that their places in life would never allow them to have or even experiences no human being has ever had before" (p. 6). When the discussion turns to changes within today's learner's mentality measured against past generations of learners, you have to remember it is not just about clothes, expressions, or artistic tastes that are being discussed, it is the fundamental way in which they look at and think about the educational model.

New learners' thinking has gone from linear problem-solving models, to parallel multi-tasking models like those displayed in the video game Man of War 2 or Super Mario Brothers. Bonk (2009) recognizes this shift in educational models and calls for new pedagogical approaches that are more active and engaging in which learner's have greater control over their own learning. These children have been playing video games before they could spell or speak in sentences so they need a lot of stimuli to keep focused. Bonk is being very realistic about today's pedagogical paradigms within the classroom when he reflects that the new learner needs more

going on in the classroom than just a lecture to engage them. He concludes with, "it is not to say they will not learn, on the contrary they will learn, but think of how much more they would learn if we as educators engaged them with pedagogical practices in their preferred format of digital learning" (p. 33). His comment makes sense when it is put into that kind of realistic perspective of everyday life.

New Ways of Learning

Interactivity seems to be the best word to describe the video game experience that can enhance education within the classroom. Collins and Halverson (2009) use "interactivity" to describe "a new way of learning that is a way of engaging students in boring content that otherwise would be hard to get them to learn" (p. 19). Collins and Halverson muse that interactivity will change the possibilities for learning because it provides learners with immediate feedback. Feedback allows learners to see the consequences of their decisions immediately or the feedback on the consequences of a series of actions or a strategy for interaction. Immediate feedback is at the heart of Collins and Halverson's statement, which allows the player to self-correct and immediately change their line of thinking to achieve more success during the game.

Stakeholder's Roles

Stakeholder's roles within the classroom also change as new learning platforms are used. Bonk (2009) in his book *The World is Open* talks about how educational pedagogical platforms for learning engagement are currently in a state of metamorphosis. In the old educational paradigm of teacher-centered learning the material in the curricula must have value in the eyes of the educational institution it serves. "This educational value is measured by the sense of educational purpose, methods, and relevant subject matter, which match up to existing outcomes within past practice created by the educational institution" (Bonk, 2009, p. 287). In the new

educational paradigm of subject-centered learning within video games there is purpose, methods, and relevant subject matter, which also give the experience educational value.

The problem, as Bonk sees it, is that the new computer game learning experience does not line up with existing pedagogical practices, assessment strategies, and outcomes, which dissuade educators from venturing into this area. Bonk (2009) recognizes this problem, but points out "we are in the midst of a major shift in how people learn" (p. 287). Until curriculum advisors create new digital pedagogical practices for learning, the education system cannot take advantage of this change. The education system that is set up now punishes those teachers who choose to venture outside the set parameters of existing practice, which ironically is modeled after past practice used in classrooms for the past 200 years. Virtual worlds have not existed before now so how are they allowed to become part of the system that is based on past practice. True change must come to core-subject curriculum pedagogical paradigms so they can achieve growth in new areas such as situational understandings, terminology, and learning communities.

Building on Their Own Experiences

Bonk's (2009) concepts favor a platform for the video game player which is more varied, informal, and individualized. In his view, "the better models of learning included choice, empowerment, creative expression, meaningfulness, and individuality" (p. 94) which video games address. When the interactive video game learning platform is used the teacher becomes the facilitator by giving control to the learner whereby a student-centered learning environment is established, but with outcomes guided by the teacher. More importantly Bonk argues the learning experience involves individual choice for the learner which leads to better engagement while using the new learned behavior in context with the learning environment.

Collins and Halverson (2009) contend that technology has transformed our larger society, but has yet to make as big an impact within our school system. In today's curriculum, the computer (21st century technology) is not at the center of the learning experience where it should be for the vast majority of school children.

> The computer has been relegated by the status quo to an elective study course status being used to do such things as programming, literacy, data processing, and accounting courses where it does not threaten the teacher's role as controller of all knowledge in the classroom. (p. xiv)

Technology say Collins and Halverson has been kept on the periphery of schools and used for the most part only in specialized courses.

When a student enters the modern world of work chances are the majority of their time is going to be spent working with some sort of a computer in their workplace. Societies are demanding digital skill sets from their young and it is the education systems mandate to deliver new ways of doing and thinking to the learner, which can be found in the video game platform. Collins and Halverson (2009) question whether our current schools will be able to adapt and incorporate the new power of technology-driven learning for the next generation. In conclusion, they contend that if educators cannot successfully integrate new technologies into what it means to be a school and their pedagogical practices; students with the means and ability will pursue their learning outside of the public school system.

Learning Communities

In Shaffer's (2006) book, *How Computer Games Help Children Learn*, he describes learning communities as: "groups of people who share similar ways of solving the same kinds of problems" (p. 140). When a player takes on an identity in a video game they must think like their

character in order to be successful. If the character chosen is a soldier, then they think, act, collect weapons, look at terrain, and report up a chain of command like a soldier. Their actions, deals, habits, and understandings are created to allow them to look at the virtual world in the game the way a soldier would in real life. This type of "epistemic frame" (Shaffer, 2004, p. 15) allows the player not only to use the language and symbols that are interconnected in a soldier's world, but to look back at their virtual world through the eyes of a soldier and make decisions that win or lose battles and lives. As Shaffer (2004) puts it, "the epistemic frame hypothesis suggests that any learning community has a culture and that culture has a grammar" (p. 16). When students become participatory agents in that learning community they quickly learn that grammar. It suddenly has a value to them which they use as a currency inside and outside of the game.

Student Centered Learning

The philosophy of student-centered learning as explained by Hunkins and Ornstein (2004) describes "the learner as the key player who must participate in generating meaning or understanding during the learning process" (p. 117). The authors look upon learning as a personal construct that builds on the learner's cognitive and affective learning domains. Hunkins and Ornstein view traditional education paradigms, which teach cognitive domain skills very well, but they explain it's in the affective domain is where learning models falter. Planning, making sense, and showing understanding have been proven to work well in rote learning. The hard part is when you try to teach rote learning in the affective domain. Topics such as ethics; social implications, motivation and confidence need to be left up to the individual to decide.

The example used by Hunkins and Ornstein (2004) of the learner generating their own meanings highlight student participation in the learning process. As a learner would you rather

be sitting back listening to a story or playing a part in it and being interactive? This is where video games impress me the most with their pedagogical paradigm of immersing a learner in a safe-to-make-mistakes learning community that teaches the learner accepted ways of doing and knowing with immediate feedback and self-correction, which gives them control of their learning. Also being able to select your area of interest engages the learner into their virtual world and they learn in both cognitive and affective domains.

Postman (1995) stated "every technology has a philosophy, which is given expression in how the technology makes people use their minds –in how it codifies the world, in which of our senses it amplifies" (p. 195). Learning from video games brings forward two very important philosophical positions forward, one is competency-based learning and the other is play. Postman (1995) goes on to explain "Competency-based learning brings forward the importance of helping students see the relevance of what they are learning in their lives by clearly linking new skills learned to the various useful and meaningful contexts" (p. 196). This transfers to video games nicely as when the player can master certain skills required in their learning community, the learner can advance forward in their virtual world and also learn digital skills for the real world.

Three Dimensional Learning

Prensky (2007) states "new digital technology is dictating not only our kid's future, but also the new paradigm for educating" (p. 3). He asserts his concept of video game learning, which is part of this new digital technology, presents an interesting conundrum for current educators who are not versed on how to use them as a learning platform. Video games are not included in core-subject matter so they hold no value to the institute of education because they do not match any learning platform used in past practice that the system is based on.

As a classroom teacher I have learned it is not enough for the learner to just memorize the facts, the learner has to make sense of the information. Collins and Halverson (2009) describe how important it is for learners to synthesize the information they glean from the different sources. “They need to locate and put information into situational constructs, which allows that information to take on new meaning” (p. 10). I have had students in my classroom that have read a novel and given an excellent report on it, but other students were lost and could not hand in much of the report. The same students who did an excellent job in the novel report were asked to give a summation of a comic book. These students easily understood the story line, but it was the unwritten second and third storyline within the pictures that gave them trouble in the comic book. The students who did poorly in the novel study excelled at explaining the codified two or three storyline plots within the comic book and how the characters related to each other on different levels. The difference between the two mediums was one-dimensional (words), the other was two-dimensional (words and pictures with meaning).

Shaffer (2005b) discusses three dimensional learning in the new media of virtual world computer games, which allows the learner to immerse themselves in multiple streams of learning simultaneously within the game. The virtual world Shaffer explains not only takes the learner into a socially constructed learning experience where they select the topic, designed the character, and use the terminology in context, but they also problem solve their way through-out the game. “The learner effectively becomes the character within the game and uses the characters ways of doing, knowing, thinking, and terminology to experience that virtual world” (p. 6). The point being made is it’s not just learning about knowing and thinking, it’s how to use that new experience in a social context within situated understandings, which makes that knowledge more valuable.

The shift of traditional control in the student-teacher relationship is turned upside down in educational video game experience. Dewey (1938), comments on the need for control during the learning experience and what happens when control is rejected. “When external control is rejected, the problem becomes finding the factors of control that are within the experience” (p. 21).Controls within the video game experience, which are the rules, can be explained by the teacher in an advisory role that includes them in the learning experience. Therefore the responsibility of learning is transferred to the learner, but enforcement of rules and assessment within the game becomes the video games role instead of the teachers.

Bonk (2009) offers up “The problem with computer games is that they do not map directly onto educational goals and outcomes” (p. 285). It's only when the educational authority designs a game with selective outcomes that corresponds with the curriculum, which they want to achieve, that the video game will become something of educational value to them. Video games or virtual learning worlds have a definite effect on changing the human capacity for collaboration, communication, interaction, and learning.

Complexity of Learning

I first came across the term “multi-threaded learning” in Steven Johnson’s book (2005, p. 65), *Everything Bad is Good For You*. This term describes the evolution of the television plot line programming over the last 30 years. The earlier television shows from the 1970’s followed a format that had one or two main characters and adhered to a single dominant plot line (e.g. Starsky and Hutch), which reached a decisive conclusion at the end of each episode. Johnson describes this type of programming as “single-thread” programming. As television evolved, the shows began to become more complex in nature. An example of this would be Hill Street Blues in the 1990’s, which had “three or four threaded plots” going on simultaneously per episode that

according to Johnson required the viewer to pay more attention to what was going on in the episode.

Johnson (2005) moves us forward to modern video games where you can transfer this way of multithreaded programming into a video game like “Super Mario Brothers” quite easily, as the player has at least six or more things going on at once during the video game that require the player to put complex cognitive and affective skills into action. One must remember it is not necessarily about the game content or who’s playing, but about the ability of the player to absorb and respond to many levels and varieties of information coming at them and reacting in a skillful way. Johnson (2005, p. 140) describes this cognitive situation as “When you look at the games programming from an educational curriculum developer’s perspective you really begin to see the interwoven programming threads, which marry complex narrative structure with complex subject matter, which progressively together lead to student learning” (p. 68).

These programming threads allow the viewer to tackle multiple complex social issues like sexism, racism, morality, and others all at the same time. In a recent episode of the show “24” the screen was split into three segments following three interwoven threads of plot line at the same time. The split screen of the show amazed me, as I just finished reading this book and realized (thanks to Johnson’s theory), not only what the show’s producers were doing, but exactly why the programmers were showing three plots (stimuli) at once on the screen. Johnson (2005) describes their goal as to mentally stimulate the viewer because they know single threaded programming does not hold the attention of today's digital television audience. The average television viewer has developed the ability to consume an incredible amount of competing information at once displaying their 21st century multithreading skills that the new

generation of digital learners has embraced. “In terms of multithreading, current shows on television usually follow around 10 threads per episode” (p. 72).

Johnson transfers this ideal from television to video game programming and surmises the same principles of multithreaded programming are used to keep the attention of the player who is immersed within a character and the video game. When playing the video game the player quickly realizes there are complex interwoven threads that connect short-term goals and long-term outcomes that affect their playing in the learning community they are in. They need to look backwards at the moves they have made, forwards to moves they are going to make, and in the present at what they are doing right now. On a social level, according to Johnson, the players are also are learning how their character conducts themselves within their peer group. This type of learning is complex, multi-layered, and enjoyable to the learner because they have chosen to participate, developed their own character and are actively motivated in shaping their own learning opportunities.

Organized Objectives

In tracking organized objectives for learning, Johnson (2005) describes one of the best ways to appreciate the cognitive strategies of gamers is to ask them what's going on in their head halfway through a long game like super Mario Brothers. “Players work on goals throughout the game like multilevel problems, objectives they're trying to achieve (icons), and patterns discovered” (p. 48). Johnson looks at how certain strategies just feel right to the player. In his experience, most players are inclined to show rather than tell the probing they have done to achieve their objectives. Interestingly enough, Johnson says probing might be semiconscious, but their awareness of mid-game objectives is crystal clear. The player’s cognitive objectives are numerous and must be kept track of simultaneously while playing. These numerous objectives

must also be categorized into mental lists of immediate and secondary objectives that are learning opportunities onto themselves. Johnson (2005) indicates what a player's mental list would look mid-game:

1. Master objective is to pass level...
2. Immediate objective is to move forward...
3. Immediate check is to jump. ..
4. Master active is to gather points for...
5. Immediate objective is to fight monster...
6. Master objective is to find three stars at this level...
7. Immediate objective is to grow bigger... (p. 49).

As you can see the mental capacity to organize objectives is paramount for the player to be successful at the game. The mental skill of organizing objectives is clearly transferable to the real world of work. Once the learner has internalized this skill, the skill is committed to memory much like walking, climbing, or a good backhand in tennis. Organized objectives allow the player to keep playing in the immediate sense, but also project themselves forward mentally in the game to allow themselves to achieve long-term objectives.

Prensky (2001b) discusses the fact that "learners brains seem to be doing anything but sequential learning and we need to provide enough flexibility in our current curriculum plans to allow the learner to gain and use organizing video game skills" (p. 3). Prensky continues on how children raised with the computers think differently (digitally) from previous generations. They develop hypertext minds and their attention jumps around very easily. It's as though they're cognitive structures are parallel, not sequential and absorbing a lot of information at once. In my opinion as a father I feel he is correct with line of thought.

Parallel Processing vs. Linear Processing

The new digital generations of learners in school today have digital skills called parallel processing and linear processing. John Dewey (1938) in his book *Experience and Education* says: "Perhaps the greatest of all pedagogical fallacies is the notion that a person learns only that particular thing he is studying at the time" (p. 48). Video games are a lot like that as many bits of information are trying to get your brain's attention all at the same time at different rates of speed and subject matter. Prensky (2001, p. 14) calls this process parallel processing and compares it to the old way of learning, linear processing which takes in one stream of information at a time. Prensky says we are all learning to parallel process from television news stations. An anchorperson who takes up half the screen is positioned above a continued single, double, or triple streams of written text, which appear as continuous ribbons of information at the bottom of the screen. Television, whether we realize it or not, has been subconsciously exposing us to visual, audio, and text streams of information all at the same time for years, training us to be parallel learners so we fit into the new digital age. Educators need to incorporate this knowledge into their daily classroom practices.

Probing and Telescoping

Probing by gamers is the masterful art of deciphering the rules of the world they are in. The real world usually parallels the virtual world of video games and players must go on probing expeditions to learn new ways of doing and thinking in their new virtual world community (Johnson, 2005) "Learners achieve results by trial and error, following hunches and tripping over clues. You have to probe the depths of the game's logic to make sense of it" (p. 42). Johnson says all games have unknown variables and natural curiosities that makes players want to learn more about the game, which challenges them to be creative in their approach. The game scholar

Gee (2005a) breaks game probing into a four-part process, he calls the probe, hypothesize, re-probe, and re-think cycle, which ironically mirrors your core subject-matter basic theory of hypothesizing in science. Johnson (2005) puts it another way, "when gamers interact with these environments, they are learning the basic procedure of the scientific method" (p. 45). Gamers truly do mimic this behavior, which further makes a case for video game inclusion in core-curriculum courses.

Students, who play video games, play for the biggest mystery of all that drives players deep into their character and ultimately the virtual world they play in. Johnson (2005) says that mystery is how the game is played successfully. Successful gamers know "the ultimate key to success lies in deciphering the rules and not manipulating joysticks" (p. 43). An example of this is in the popular game SimCity (2006) where a player develops cities just like an urban planner and deals with a lot of variables such as crime, water, power, different tax rates, and terminologies in that learning community. The player quickly learns the flow of the game if there is low crime in an area of the city you will see growth in that area and if you lower the tax rate in another area you bring in low-cost development. By probing the game of SimCity's structure and having reflective thoughts on your actions, players can rethink long-term strategies of urban development to allow themselves to be successful in the game. Text, objects, tax rates, and development strategies can come into play later on in the game so seemingly random events can become quite critical, which helps the player learn about situated understandings as the game unfolds.

Johnson (2006) warns his term "telescoping" should not be confused with the term multitasking. Telescoping is all about order, not chaos: it's about constructing the proper hierarchy of tasks and moving through the tasks in the correct sequence. "Telescoping tests the

player's ability to perceive relationships and set priorities that are measured with their success during the video game" (p. 54). In the video game world, players learn the value of the sequencing of events that happens and more importantly why they happen during the game. If they are poorly organized or do not execute efficiently, their long-term game planning suffers. Players need present tense focus on the order of events at all times during the game.

Focus

The ability of the video game player to focus is paramount during game play. Examples of the video game learning platform helping all learners with visual, audio, or physical disabilities cover curriculum are important to this study as games can be played at different educational levels depending on the mental or physical abilities of the learner. Video games can be used in classroom instruction when considering inclusion or universal design with Attention Deficit Disorder (ADD) students. Ward (2000) comments on research done by therapists at the Eastern Virginia Medical School who are using video games and biofeedback to treat learners that are hyperactive or have an Attention Deficit Disorder. Some learners who have ADD play video games to train their brains to focus their attention in one area for an extended amount of time. Ward adds ADD children have a deficiency of high-frequency brainwave signals that reduces their ability to focus on one topic for an extended period of time. Video games help train the brain to focus for more extended periods of time by creating a virtual world, which the student chooses to be interactive with. Therapists report there is an incredible success rate on learners when they get to choose the learning environment, compared to those who are forced into the learning environment. In this program therapists monitor the desired brainwave feedback frequencies. When high-frequency brainwaves have reached the game controller pad the learner is using is given more power to operate the game. As a result the learner becomes more engaged

when their brain can maintain desired brainwave activity for an extended period of time. This carrot and stick approach, Ward theorizes, seems to work because of the powerful attraction of video games, which stimulate and engage the learner. In the end, the ADD learner gets the enjoyment out of the game and achieves outcomes that include extended higher brainwave frequencies that lead to the lengthening of their attention span in other areas of their lives.

My Experience

I had a student in my grade seven class who was twelve years old, but academically about a grade one level. He was always a hard sell when it came to him doing his work and staying on task at his desk. In order to find an academic balance, his reward for doing his work was video games. When you work with learners that are so far behind academically you realize how disadvantaged they really are in their everyday lives and try to give extra help at every opportunity. The student always amazed me when he earned some computer time with his ability to enter his password, find the website, and engage in any game he wished for an extended period of time. When he was fully engaged in the game his ADD seemed to disappear and his memory recall for the game was awesome. His educational assistant and I would give him advice and cheer him on being fully aware of the social bond we were building with him by actively participating as facilitators of the game. He was a living example to me of the ability of a video game to control the attention of a player and keep it. Time spent on task is the common denominator for his learning experience on a video game as it improved his long term focus skills.

Socialization

A typical teenage video gamer a few years ago was classified as a lone teenager sitting in front of the television in a dark room. Today, nothing can be further from the truth as we have

advanced to a new generation of high quality games and gamers. Bonk (2009) discusses Massive Multiplayer Online Gaming (MMOG) around the planet in which ten million people are playing games like *World of Warcraft* or *Call of Duty Black Ops*. Multiplayer games like these allow many players to play simultaneously together within their own gaming community online at anytime, from anywhere in the world. Bonk describes this as, "an incredible display of technology and of social networking created with the Internet that has never been seen before in our world" (p. 287).

Students from my grade seven class use this format to create a network that includes just their friends only (no strangers), to play against each other from their own separate basements. They just hook up online separately from their houses without seeing each other face-to-face and play. The avid gamers in my class tell me they consult with each other if they cannot get past certain levels in the game. I found it interesting that my students went searching the online gaming community for game support on a particular game level if they were stuck. If no one in the group knew the answer they would seek out cheat sites for games that allow them to circumvent levels in games they cannot beat by getting help from other gamers.

Bonk (2009) takes an interesting view of cheat sites as he refers to them as another opportunity to learn in a different way. Kind of like changing the rules in mid-game by sourcing out another site for knowledge. In traditional education Bonk reports cheat sites would be looked upon as cheating, but in the video game platform of learning all that is happening is the player is altering the game and changing the ending. It still is a looked upon as a learning experience. The important thing from an educational viewpoint is that they have become consumers of information by creatively seeking out the literacy to change their game which is a very good example of collaboration of the players involved.

Multiplayer Online Games

Bonk (2009) also discusses massively multiplayer online games (MMOGS) that regularly draw millions of players into complex virtual worlds. Players choose to become fighters, politicians, or even traders who develop trade routes and become merchants of game equipment that players need to progress within the game. Bonk (2009) notes players quickly realized it is a huge asset to be literate and to learn to communicate in the language and grammar of the game with trading partners. These games teach learner's skills like resource allocation, manipulating situations and environments, pursuing goals, and self-esteem.

The experience of virtual world gaming can be a socially powerful one as some games require a player to develop a character to play in the game. Games like *Wii-Trauma Center: New Blood* (Atlus.com, 2008) or *Wii-G.I. Joe- The Rise of the Cobra* (Electronic Arts, 2009) requires a character to be developed and also a set of effective social practices to be used by the character in the game. An example of this game play would be from *Wii-Trauma Center*. The player would be a doctor who uses the terminology in context and makes important decisions on the battle field or emergency room that affect other characters as the game goes on. The virtual world of these games allow for full participation in the learning community in a safe free-to-make-mistakes environment, which gives the learner more confidence as a player or person. This virtual learning community is very rich in context and subject matter for learning because the game makes it possible for players to experiment with new and powerful identities (soldiers or doctors) within the game that they normally would never experience in the real world.

Building Perspectives

Collins and Halverson (2009) describe the game *Civilization 5* "as a learning platform that builds from historical progress and conflict. This allows players to see how cultures develop:

religious, military, economic, or diplomatic security can influence world development around them" (p. 119). This glimpse into the process of how and why history unfolds, say Collins and Halverson, is lacking in most textbook-dominated, fact-based approaches to history learning in schools that seem one-dimensional compared to the video game. These games do have their downside as they warn games like *Civilization 5* are almost cult like, having very serious players that organize around a goal of developing standards with important facts, skills, and understandings of what it takes to be a good player within the confines of this game. Civilization 5 has a website (www.Apolyton.net), which allows players to hold Facebook type forums, create custom modifications to their characters, and teach each other how to play the game more intensely. This website is effectively a university for the players in the virtual world of *Civilization 5*. At this university the game players are taught to develop a set of values or etiquette that reflect on what your behavior should be in the virtual world of *Civilization 5.* These values are the beginnings of enlightened socialization of all players within the confines of that virtual world. They know the basic ways of doing and thinking (social norms) that are needed to be successful in playing in that particular game.

A Video Game Model

Good video game design model as described by Ahlers, Garris, and Driskell (2002, p. 445) is circular in design. The design begins with player judgments during the game and moves onto chosen player behaviors, and then finally moves on to system feedback that allows the player to self-correct. The cycle begins again as the player moves forward in the game. In short, make a decision, make a move, get corrected, and make another decision. Ahlers, Garris, and Driskell (2002) write about their input-process-outcome game model that mimics the above design. "The goal is to develop learners who are: self-directed and self-motivated both because

the activity is interesting in itself and because achieving the outcome is important" (p. 445). An example of this would be the game *Wii G.I. Joe* where instructional content is used in battle situations that are paired with team features like an opposing group who fights in a certain manner. Self-motivated actions of the player achieve training objectives and specific learning outcomes of military curricula that seek repeated judgment-behavior-feedback loops that teach the learner. These loops are repetitive and motivated players continually return to the game to play. The players return according to Ahlers et al. because their brain is hooked on the stimuli of playing digital video games.

Ahlers et al. (2002) have established six broad dimensions that can describe video game characteristics.

1. Fantasy - imaginary of fantasy context themes or characters
2. Rules or goals - clear rules and feedback towards goals
3. Sensory stimuli - visual or auditory stimuli
4. Challenge - optimal level of difficulty and uncertain goal attainment
5. Mystery - optimal level of informational complexity
6. Control - active learner control (p. 447).

The above descriptors for learning on video games were categorized into these dimensions of instructional content because they break down the factors that not only engage the learner, but hold their attention during the game. The cyclical model of judgments, behaviors, and system feedback happen continuously throughout the game. Debriefing occurs in this model when the player finds out if they have achieved learning outcomes. Interestingly, Ahlers et al. feel learning outcomes also occur outside the game for the learner during reflection time after the game. Video game players do reflect when they are not successful and their self-motivation pushes them to

look for answers to beat the game next time they play. Ahlers et al., (2002) explain this behavior as "feedback provides an assessment of progress towards goals that drives the motivated performer to expend more effort, to persist, and to focus attention on task" (p. 454). Essentially the players have two options, one is to quit the game or two is to become more motivated to increase the effort to meet the standard required by the game to proceed.

Assessment

When forming the argument for video games being included in core-subject matter within the classroom, the topic of how we as educators assess skills learned needs to be discussed. Collins and Halverson (2009, p. 42) discuss how "…there is little room in the curriculum for adventurous uses of computers, such as to carry out in-depth research or complete meaningful projects" (p. 42). The quantitative approach to assessment looks at definitive answers very well but cannot measure feelings or values as well as a qualitative approach. These are intangible skills acquired during game play which fall into this category. This is another reason this study must look at pedagogical practices while using the video game platform. Best practices can bring out the best in students and take advantage of this technology for maximum student benefit.

Cohen (2010) in her *New York Times* article explains how assessment should be allowed to evolve along with pedagogical paradigms and not frozen. By ranking schools and altering funding according to performance, you hold the entire system hostage to the standardized test with no room to expand beyond the set parameters of established practice. Cohen declares that creates a closed system, which effectively eliminates video game learning from core-subject matter, "…the traditional process is not so much the gold standard, but an effective accommodation to the needs of the field. It represents a settlement for a moment, not a perfect ideal" (p. 1). Schools teach many other things to students than what is on a standardized test.

Virtues, social skills, reasoning, and debating to name a few, need to be valued equally by the school system.

The qualitative way of testing for learning outcomes involves a series of questions, problems, and hypothetical's that let the learner demonstrate in artificial context the new behaviors and approaches they have learned. Collins and Halverson (2009) observe that schools need to broaden their scope of assessment to allow for testing of non-cognitive skills. "The process of lecture, study, drill, and test works excellent for the student population of sequential learners with good memories for facts, but at the same time punishes learners, such as abstract learners, who do not have these learning traits" (p. 29). This is why a certain segment of students who are sequential learners are consistently successful as they possess some of the skills that the current education system values.

The new platform for video games creates learners with cognitive skills and also affective skills such as motivation, attitude, socialization, and good classroom behaviors. The real measure of learning, Collins and Halverson (2009) discuss, which quantitative studies cannot measure is behavioral change. Video game testing for learning outcomes occurs as the learner plays in real-time. During this time they are constantly tested in real-time situations within the game's virtual world. The important thing to remember is if a mistake is made in a virtual world situation, the learner has immediate feedback and a chance to display their newly acquired knowledge by changing their behavior in the next game cycle. In regards to feedback, Collins and Halverson (2009) talk about how video game designers create real opportunities for students to improve their performance over time by building opportunities for reflection into video game learning environments. Reflection is a very important part of the learning process for any learner. "It occurs when the learner looks back on their performance and measures their performance against

a set of standards or other performances" (p. 27). Video games record performances for players by giving scores or letting the player open new worlds as a reward for their past performance. Reflection and self-correction also allows players to look back on their performance and think about how they could change their behavior to do better the next time.

Teacher's Pedagogical Practices

Over the last 200 years the education system has evolved itself into a system where everything is learned in a linear fashion. Collins and Halverson (2009) believe this is part of the reason why schools have kept new digital technologies on the periphery of their core academic practices. They describe "a linear system in the sense of dividing the learners into age groups, knowledge into disciplines where subject matter becomes progressively harder. Of course we cannot leave out the textbook, which is read in a progressive linear fashion" (p. 6). One of the ways new teachers are still trained is to deliver content in a linear, reason thinking manner and then give a test. Delivering this pedagogical model of traditional education is the most cost effective model developed to date by the education system.

Prensky (2009) states that new digital learners need a better platform for learning which uses the technologies available to them at this point in their lives to enrich their educational experience. Prensky argues that most people in the general public do not think we have a problem with the pedagogical paradigms they assume the problem lies with the students and teachers. You can see their cries for help in the media; he says "all we need is more good teachers to teach" (p. 21). The problem with this thinking is most people mean good old fashion 19th century teachers whose drum roll is lecture, drill, study, and test. This model of rote learning is becoming less and less effective with the new generation of digital learners as they disconnect a lot quicker in the classroom than their parents did. Prensky states that after 200

years there are cracks in this old pedagogical paradigm and forward-thinking people can see them and call for change. This change will come when society demands more digital technology skills from its education system.

Prensky (2001a) explains the difference between new content and rote learning, "perhaps the most important difference is that the stuff to be learned-information, concepts, relationships, etc.-cannot be just "told" to these people. It must be learned by them through; questions, discovery, construction, interaction, and, above all, fun" (p. 6). A better platform for learning, Prensky contends, would be very useful, but using the digital platform of video games to teach curriculum outcomes does not interface with traditional testing assessment, which traditional education relies on to show accountability in the classroom. Another reason we are not as successful at educating children as we used to be is because we are educating teachers to teach a new digital generation of learners in the old ways of rote learning. Video games also threaten the old paradigm of teacher-centered learning and push it towards a more student-centered model. When this happens the most common reaction from educators is for them to resist technology and fight change. They retreat from technology and continue to use their old safe pedagogical paradigms that prepare students for an education used in the past, not the future. Prensky (2008) picks up on this and argues the real problem or thinking has not yet evolved enough to catch up with technology. "We believe the way we did it in our time was the "real" way, the only reliable way, and that's what we want to teach your kids -the basics" (p. 1). The real question here is what are the basics? Are the basics provincial capitals, wars or battles from the past and old prime ministers? Prensky (2008) points out "the reason we memorized so many things in the past was only because there is no handy or speedy way to look them up" (p. 2). Being open-minded

about the evolution of knowledge and what learning platforms we use in education to teach learners goes hand and hand with realizing that even the best methods change over time.

Teacher as Expert

Any traditional learning platforms with rote learning methods are by design teacher safe environments that support teachers as the expert. Collins and Halverson (2009), reflect on this thought

> As teachers know exactly what to expect and by acclamation they are the experts. In teaching curriculum with video games, there is no script to tell teachers how to conduct themselves in a virtual world environment because there is no existing standing practice to teach educators what their role is in the virtual video game world full of new ways of doing and thinking. (p. 6)

This confirms the need for studies like this to be done to look for alternatives for pedagogical practices.

Prensky (2001) makes a good point when he says “today's generation is the first generation to know more than their elders about a key technology in the world -computers” (p. 8). The problem that educational leaders need to recognize is there is a phenomenon in today's society in which kids have totally outpaced their parents and elders in the new technological ways of the world and want to use this new found technology in their learning.

Summary

This chapter has looked at digital learning skills that evolved from the video game learning platform. This video game learning platform was endorsed by many experts in the field of digital education who saw this paradigm as the beginning of a new age in education that should change pedagogical practice within the classroom. By integrating video games into the

classroom, the education system would partially level the playing field for auditory, visual, tactile, or abstract learners who struggle with the current lecture, drill, test, learning platform. These alternative forms of learning are distributed to the learner by using a video game platform that delivers core curriculum subjects in a safe-to-make-a-mistake environment, which replicates a professional learning community (e.g. doctor, politician, city planner, and professional solider). In this environment, curriculum outcomes embedded within the game experience begin to be treated by the learner as a fluid because there is so many variables within the game itself, therefore pedagogy used by teachers should be adapted and be just as flexible.

CHAPTER THREE

Methodology

Traditionally, interests in curriculum development in education have always been divided between curriculum theorists and pedagogical practitioners within the classroom. This practice vs. theory argument begins every time classroom teachers receive professional development from their peer group and are directed to implement new ideas. It has been my experience that in the end, the classroom teacher decides which pedagogical practices will be used to deliver outcomes and which ones will be left to die on the vine. Keeping this in mind, this study looks at pedagogical practice while using Information and Communication Technologies (ICT) within the context of playing video games with a focus on comparing current pedagogical practice within the classroom to pedagogical practice in the computer lab where the computers are physically located. The following chapter discusses the rationale for choosing case study methodology, data collection and analysis methods, and the intent of this qualitative study as it progressed to fruition.

Case Study Methodology

I have chosen to use a qualitative case study approach to investigate teachers' perspectives of their pedagogical practices when comparing video game learning in the computer lab to traditional pedagogical practice in the classroom. The main data collected in this research study was of human orientation using the participatory subject's worldviews, values, and perspectives on pedagogical practice that was unique to that person and must be looked upon as such. I must also try to interpret the subject's opinions when asking questions and even then the information assembled is from multiple interpretations of reality from the participants involved. Merriam (1988) discusses how difficult this type of case study is when she observes, "case study

research is one of the few modes of scientific study that admit the subjective perception and biases of both participants and researcher into the research frame" (p. 39). I acknowledge that there is bias in some form or another in every study and as a participant observer I have tried to be conscious of my own bias and that of my participants throughout the course of the study.

Rationale for Choosing Case Study Design

Merriam (1988) explains that case study design is chosen precisely "because the researcher is interested in insight, discovery, and interpretation rather than hypothesis testing. This makes for a good qualitative study" (p. 10). The study was designed to have myself as a participant observer, which allowed me to become involved with the teacher and the students in their world. This allowed me to get physically and mentally involved to interpret actions by the teachers first hand as opposed to simply observing from a distance. My role also added another perspective to the study that gave more integrity to the research. This in turn gave the added benefit of more understanding of the participant's viewpoints in terms of kindness, caring, and compassion. Guba and Lincoln (1981, p. 119) describe the end product of this type of study as "interpreting the meaning of…demographic and descriptive data in terms of cultural norms, community values, and deep-seated attitudes". Insight and discovery of the participant's impressions rather than predictions of what they thought is what I have strived for during the course of the study.

Interpreting the teacher's meta-cognitive thoughts on their pedagogical practices in the classroom was awkward because I did not want to try and predict what they were going to say. During the interview and focus group sessions I let the participants talk and give their reflective impressions, which became the main source of information, along with my observations. Qualitative data analysis in this study used the interpretive approach to collect data. The

interpretive approach used in this study allowed me to treat social interaction and human activity during the study as text, which was then analyzed looking for common understandings at the end of the study.

In talking about common understandings in qualitative studies, Berg (2001) expresses "researchers frequently develop many interesting (and sometimes unreliable) impressions about possible patterns" (p. 117). It is so important to remember that when a researcher is dealing with the human mind, limitations must always be mentioned regarding how different people see their own reality of the world around them. This is why I choose a qualitative study as I am dealing with different world views of people as my main source of information. Relying on people's impressions of events can be frustrating as two people can experience the same event, but come away with two separate experiences. Participants have different opinions on why and how learning occurs in education according to their own biases. Therefore teacher reflections were given my full attention in looking for common points expressed by all participants in all the data collected.

When I was looking at the choice of doing a qualitative study or quantitative study, I did not choose a quantitative study because I would have to use hard data such as facts, statistics, and counts to answer the research questions and come to understandings about the research. This study involving educator's pedagogical practices could not be done properly using this method because of the need to interpret the teacher's opinions of events that occurred. Yin (2003) suggested that "case studies are the preferred strategy when 'how' and 'why' questions are being posed, when the investigator has little control over events, and when focus is on a contemporary phenomenon within some real-life context" (p. 1). How and why questions dominated the

discussions during direct observations and interviews that allowed the teachers to talk at length expressing their views.

Qualitative and quantitative studies are in diametric opposition with each other as the quantitative studies seek out large volumes of participants to look for trends. Qualitative studies, on the other hand, seek a smaller group of participants who are willing to share their personal viewpoints and feelings. It is important to recognize the differences between these two types of research. Berg (2004) makes the distinction between the two, "Qualitative research, thus, refers to the meanings, concepts, definitions, characteristics, metaphors, symbols, and descriptions of things. In contrast, quantitative research refers to counts and measures of things" (p. 4).

The Researcher's Role

My role as a participant observer is a very important one. Being a good communicator is very important as you must ask the right questions and be ready to listen to what the participant is really saying underneath their observations. Sensitivity to the context of all the variables that come into play during the study is a meta-cognitive process that must always be at the forefront of your thoughts so you can honestly represent all viewpoints in the study. Good research shows us the more viewpoints of a construct the more clarity is brought to it. My educational philosophy is of student-centered design and therefore my research design reflects that background. I chose this study not only to compare different pedagogical practices, but also to ask the secondary questions of how and why learning takes place in conjunction with video games, which in my opinion should dictate pedagogical practice used. I believe learning is built on prior experiences that can be experienced in safe-to-make-mistake environments found within most video games.

My role as a participant observer allowed me not only to be present throughout the entire study, but as an active participant as well. I witnessed all the events that occurred during the study, which enabled me to report my thoughts as they relate to the guiding research questions. As Guba and Lincoln (1981) state:

> In situations where motives, attitudes, beliefs, and values direct much, if not most of human activity, the most sophisticated instrumentation we possess is still the careful observer-the human being who can watch, see, listen…question, probe, and finally analyze and organize his direct experience. (p. 233).

This statement influenced my decision to use my meeting at the start of the study for some informal conversation to put the teachers at ease with my presence in their classroom. I felt it was more important to have them relaxed and ignore me in order for me to organize and interpret their pedagogical practices during the study.

Research Questions

The purpose of the research questions was to drive the research towards looking at the teachers' perspectives of their pedagogical practices while using the two learning platforms of video games in the computer lab and learning in the classroom. These questions were answered by triangulating data from different sources such as my own observations, each teacher's perspectives, interview questions, and the focus group session. By doing this, I looked at the questions from different perspectives, which helped me answer the question better. The questions also kept my inner focus on specific issues related to the teacher's pedagogy. These were the research questions used by me for the above purposes during the study;

1. What are teacher perspectives of their pedagogical practices when comparing video game learning to traditional pedagogical practices within the classroom?

2. In looking at engagement levels during both lessons, what lesson really engaged the student more and had them illustrate higher engagement levels? Why?
3. What skill sets do students use and learn while playing video games?
4. Were the teachers cognizant of their role during the experience?

These questions give further definition and clarity to the study's purpose of helping to build an understanding of the traditional teacher's perspectives of their pedagogical practices in the classroom and the computer lab.

The Design for the Study

This section discusses the design for the study, which consists of content covering the participants in the study, the lesson plan delivered by the teachers, data collection and data analysis. Also detailed are procedures and questions used in the interview and focus group, which asked the teachers to be cognitive of their pedagogical practices. By doing this the teachers became the main focus of the study and not the students because ultimately the design and implementation of lessons taught in the classroom community originate with the teacher and that's what I wanted the study to reflect. Opinions of the teacher's current pedagogical practices were very important to this study because they described the ones used, and more importantly, not used by the teachers.

Participants

Teachers for the study were chosen from a group who work at Greenwood School (a pseudonym has been assigned to the school and teachers in order to preserve the anonymity of the people involved in the project). I selected the three participants for the study based on the following criteria:

1. Skilled teachers with more than 10 years experience

2. A variety of grade levels and interests
3. Typical skills in using ICT in the classroom
4. Established classroom management skills

After some consideration, I invited three teachers to participate in the study and all three gladly accepted. They were currently teaching grades three, four, and five and had teaching experience of 10, 18, and 29 years. It was important for this small study to get different age groups of students as each grade presents its own challenges for pedagogical practice. In my opinion, the participants were perfect for the study as they were all competent teachers in their own right. I wanted to develop an understanding of a typical classroom, so I selected teachers that did not have a particular expertise in the field of ICT. My own role during the study I will describe as a participant observer who interacted with all participants interviewing and observing teachers separately and together.

Classroom Observations

Once the participants had been identified, I organized an opportunity to meet with each for 45 minutes to discuss the lesson we were going to use in the study and to discuss how the teacher was feeling about having me in the classroom as a participant observer. After spending some time getting them all on the same page, they agreed to teach a lesson about the proper use of nouns and verbs. This outcome is considered within all three grade levels in the Manitoba English Language Arts Curriculum (www.edu.gov.mb.ca). This was a good choice as two of the three had these outcomes coming up in their year plan. After some searching on the internet I found a video game that could be utilized in the computer lab segment of the observation that contained the desired outcomes for the study which I will discuss later. During both sessions I

took notes on the steps used by all three teachers that described their pedagogical practices, which appear in chapter four.

A short five minute individual meeting was conducted immediately before the pedagogical experience to relax the participants with my presence in their classroom as they delivered the lesson using their most comfortable pedagogy. I was not seeking data at this point, but acceptance into their classroom. I believe a good interviewer does not jump in cold, but takes their time with the participants to get to know them a bit better so opinions and actions can flow freely. I also knew I had three other opportunities which included an individual interview, a focus group and my own observations to collect data during the study. Originally I planned an interview first, but the need for a good rapport changed that approach.

Pedagogical practice. As the research observer, I knew that the student-teacher relationships that were required to perform the two pedagogical practices considered during the study were very different from one another. In the traditional (rote learning) teacher led practice of lecture, study, and test, information is delivered in a teacher-centered classroom with the teacher being the conduit for all knowledge and assessment in the classroom. The second comparable pedagogical practice utilized in the study was student-centered using a three point model reflecting the student, teacher, and video game relationship. This model follows philosophy designed for the student to become more responsible in their own learning community and takes responsibility away from the teacher who becomes in effect a facilitator with the video game introducing content outcomes.

When I originally planned my research, I thought that I would have the teachers teach two related, but different outcomes in the two lessons that I planned to observe. The first outcome would be taught in the classroom using their traditional classroom practices. The second

would be taught in the computer lab using a video game platform that I would find to teach the outcome. However, when I met with the teachers before the study began, each of them expressed a strong desire to teach the lesson in the classroom and then do a follow-up lesson using the same concept in the computer lab using a video game. I felt like I needed to accommodate their pedagogical beliefs so I altered my research plan to fit their needs and found a video game that matched the curricular outcomes that they planned to teach during the classroom observation.

Selecting a video game. For this study, the point of selecting a video game revolves around the construct of play, not necessarily the specific theme of the chosen game. It was important to find a game that matched curriculum outcomes and have a game that interfaced with the teachers' lesson plan. The process of finding a video game to use during the study that mirrored the curriculum being taught was rather easy as the internet has many educational games to choose from. All of the teachers liked the game I found on the website www.ABCya.com, "Ice Cream Talk: Nouns and Verbs". The video game matched their curriculum outcome needs as each higher grade played at their grade level the game content became more difficult. The game involved a monkey catching a scoop of ice cream in an empty cone every time a verb or noun was identified from a sentence. The player needed to collect ten scoops of ice cream in their cone to move forward to the next level in the game, getting one wrong meant self-correcting their behavior as the video game gave immediate feedback on their play decisions. As the study moved from one grade level to the next, the sentences of verbs and nouns were still used in the video game, but the difficulty of the verbs and nouns increased. This eliminated different video game content as a variable in the research and brought the pedagogical practice of each teacher in the classroom and the computer lab to the forefront of the study, which allowed me to observe and the teachers to reflect, on their own pedagogical practices in both areas.

Data Collection

Data collection in the study used many sources of reference, as with any study the more viewpoints on the selected topic the better the clarity. Sources of information for the study included observations by myself and teachers, interviews, a focus group discussion, and my field notes and reflections. I had proposed a log book for the teachers for the teachers to write any reflections during the study, but they all declined to do so. The teachers cited lack of time and nothing really to input at the time as they were concentrating on supervising the class. The process of data collection taken allowed me to recognize appropriate common points from different sources with a thematic analysis at the end of the study that explained the participant's meta-cognitive thinking in regards to their pedagogical practices during the study. By using these different methods in collecting data during the study I found that one source's strengths compensated for another's flaws, which allowed the data to speak with one voice and let the common points reveal themselves.

Interviews. Interviews (Appendix A) were created to record the teachers' meta-cognitive thinking when comparing their pedagogy. The goal of the seven interview questions was to gather information from the participants regarding their pedagogical experience in the computer lab as well as the classroom during the study. I used the interview to explore the structure of the teacher's current pedagogical practices in order to understand teachers' perspectives about whether or not video games should be utilized within the mainstream core-subject curricula. The interview I thought would be ten minutes turned into a 40 minute recorded session for each of the participants with Margaret's being an hour long. The teachers were really thorough with their viewpoints and I let them talk until they were satisfied with answering the questions. Transcripts were then created from the recordings.

Focus group. The focus group questions (Appendix B) asked the participants to discuss their experiences in the study and their personal opinions about the use of video game learning in core subject curriculum outcomes in a group format. The focus group discussions were very different from the one-on-one interviews used with the interview as the digital recorder was placed in the center of the table during this session and became forgotten in the free-flowing conversation by the teachers with their peers. This session went on for 60 minutes with all of the teachers pretty much in agreement with their responses. As each question came up the teachers expanded on the other one's thoughts. The digital recorder captured some insightful viewpoints from the participants which led to connections with common understandings held by other participants.

Field notes and reflections. I made notes during observations of pedagogical practices in the classroom as well as the computer lab. The notes summarize the pedagogical practices in the order that they occurred during the lesson. The itemized list is located in chapter four data analysis as it lists in order the pedagogical practices used by the teacher used to deliver the lesson to the students in the classroom and also in the computer lab. These notes are important to the study as they identify the pedagogical practice used by the teachers in both settings.

Most of my reflections after the study came to me during the thematic analysis at the end as I read the exact words from the transcripts of the teacher's recordings back to myself. Reading the transcripts brought out common points from the data expressed by the participants. The repetitiveness by the participants of these common points, which were the basis for the themes, gave me a good reason to trust the validity of the information found during the study.

Trustworthiness of the Findings

Determining the trustworthiness of the information used in this study is part of the research process. Findings in this study were determined by my observation and listening skills while asking questions and having conversations designed to get the participants to express their thoughts of what they themselves believe to be their own truths. Respecting these truths means giving room to the participants' world views and recording them as internal validity. Internal validity as described by Merriam (1988)

> …is dealing with the question of how one's findings match reality. One person's version of reality does not necessarily mirror another's because of the different worldview of each participant. It is up to the researcher to capture the participant's perspectives rather than the truth per se and present a more or less honest rendering of how the teachers actually viewed themselves and their pedagogical experiences. (p. 166)

Merriam's quotation allowed me to remind myself to reflect on the teacher's viewpoints and how they relate to the research questions. These perspectives were an honest rendition by the participants of how they saw events happen during the study and I wanted to respect their valuable opinions.

I also looked for evidence of learning by the method of triangulation. Lincoln and Guba (1984) use this term and describe the process as when evidence is collected from several different sources in this study being the interview transcripts, focus group results, and my own observations. By using this method trends and patterns emerged from the research and became more apparent to myself and all the while the reliability and validity of the study increased. These sources of information pull single pieces of learning together and put them into themes for me to reflect on at the end of the study.

Ethical Considerations

The participants of this research study were given every right to privacy during the research study process as I signed an oath of confidentiality agreement (Appendix C). Their personal thoughts on events during the study were not discussed with any third parties or quoted in any other studies. In order to get a good grasp of the study, the participants were given an outline of the study in the form of an invitation to participate in a research study (Appendix D). This was followed by a school permission form (Appendix E) which asked for permission from the principal and a personal consent form for the participant (Appendix F). The last letter was to the local school district (Appendix G) to ask for permission to hold the study. Finally after the entire editing process was completed, the participants were given a copy of the research thesis created to see for themselves which light they were painted in. Ultimately the burden of creating an ethical research study lies with myself. I must be conscious of my own philosophical underpinnings in relation to the study to be fair to all involved. As Merriam (1988) says "self knowledge can form the guidelines one needs to carry out in an ethical investigation" (p. 184). Being conscious of one's thoughts and actions, was paramount for me during the study to maintain my integrity and treat the participants with compassion and respect.

CHAPTER FOUR

Data

In looking at the data analysis of this qualitative case study, information gathered requires me to ask whether the information collected provides insights into the research questions that have driven the study. All information was given careful consideration and reduced to common points to make sure each participant had reflected their own personal worldview of their research study experience. Berg (2001) discusses this necessary reduction "as qualitative data needs to be reduced and transformed in order to make it more; readily accessible, understandable, and to draw out various themes and patterns" (p. 25). This was achieved and the process provided good insight.

Recording teacher's impressions of their day-to-day interpretation of their pedagogical practices was very important to the integrity of the study. In my opinion, the classroom issues of pedagogical practice that this study looked at are truly grounding issues for advocates of video game learning as pedagogical practice dictates how the new technology is used in the classroom by the teachers in the future. In turn, how students learn during the video game format should also affect teacher pedagogy.

Pedagogical preferences and gender are also discussed in this chapter. Pedagogical preferences of the teachers clearly appeared throughout the thematic analysis and were sought after by the research questions in this study to have the teachers reveal what they consider valid pedagogical practice in their classroom. Although the teachers were interviewed separately and then together at the end of the study they all held very similar views on video game learning and valid pedagogical practice. These views were also the same for gender as discussions during the study (with the help from interview questions) brought the subject of boys versus girls as a

variable into the conversation. The intent of this line of questioning was to see if either group held a competitive advantage or they excelled in different areas that might change preferred pedagogical practices by the teachers. The teachers were quick to reveal their viewpoints on this topic of gender as they already had formed opinions from previous video game experiences.

Pedagogical Preferences

In discussing current pedagogical practice in the classroom with the teachers, and using the research questions as my guide, I wanted the teachers to reveal what they considered meaningful and worthwhile pedagogical practice within their classroom and the computer lab. With all teachers having prior experience in delivering lessons in the computer lab they were all in agreement on most points brought up in the three separate one-on-one discussions about teaching in the computer lab.

> Robin: If we were going into the computer lab first I would have them sitting at their desks first. Because it's much easier to have them [the student's] focused and paying attention here [in the classroom] when they are all facing the same direction. As in the computer lab they are all facing different directions [which leads to loss of control]. The teacher controls the pace in the classroom.
>
> Margaret: In the classroom if there were any students not pay attention…I could quickly pull them back in.
>
> Heather: I felt I had their attention more in the classroom….they were focused on me. In the computer lab they were focused on their computer.

In my opinion, teachers participating in the study were trained to control the classroom at all times. With digital learning platforms this approach does not necessarily work all the time, so new pedagogical approaches must be found to reflect new learner-centered technologies. Bonk

(2009) says, "….it truly is the age of learner-centered and empowered learning" (p. 10). That which was previously accomplished with textbooks and classroom lectures has shifted to other resources and new technologies that change stakeholders roles "and those formally known as teachers are better positioned as guides, tutors, and mentors" (p. 10). With these comments Bonk describes an undercurrent emerging in education today which is progressively changing the teacher's role and pedagogical practices.

In discussing lesson planning for the 45 minute teaching block, I found it very easy to match up the curriculum outcomes chosen by the teachers. I found a website containing the same desired outcomes that could be used for all three grades with the same content becoming progressively harder for the older student's. The consensus amongst the teachers was that they wanted to teach the nouns and verbs lesson in the classroom first, then in the computer lab.

Heather: It is easier to monitor what is being learned in the classroom. If we went to the lab first, too many questions would be raised.

All three teacher's lessons all followed a familiar pattern of teaching keeping the constant attention of all students with all eyes forward, calling on everyone in the class for input. During the lectures I made these notes of what happened during the classroom pedagogy and I have to say the teacher's pedagogy followed each other very closely:

1. Teacher writes on the board while explaining the concept being taught.
2. Class reads sentences out-loud together with teacher prompting.
3. Positive reinforcement is given by teacher.
4. Teacher goes to higher level of nouns and verbs.
5. Teacher reviews concept taught to students.
6. Class is tested by teacher on what was learned during lesson.

Interestingly all three teachers used this same pedagogical approach when delivering the lesson in the classroom. As you can see from the above list the teacher's role is paramount with the teachers being the conduit of all information and assessment within the classroom.

In the computer lab the lesson went quite differently as the children quickly scrambled to get to a computer and were booting them up before the teacher could give some instructions. Although the class was loud and a little chaotic at the start the students were quickly engaged in the website they were told to go to. During the computer lab lesson the following observation notes were made by myself to compare classroom and computer lab pedagogy:

1. Teacher writes website on board for students.
2. Students play game.
3. Game gives immediate feedback to students.
4. Student's self-correct to move forward in game.
5. Finishing game is evidence of student assessment by video game.
6. Students ask teacher to go to higher levels of game.

Although the teacher did not have total control of the computer lab the students were totally engaged with some even displaying peer-to-peer behavior in helping out others to find the website and explain the game to each other. Once engaged in the game they appeared to block out everything around them and immersed themselves into the game prompts.

In order to improve pedagogical practice in the classroom and the computer lab the focus group agreed on all of the following points:

1. When the teacher taught the lesson in the classroom there was more student focus within the classroom.

2. The teacher should always teach the lesson first within the classroom, and then reinforce the curriculum outcomes in video game format in the computer lab.
3. When all the students play the same game in a group format, it creates competition within the class social structure that creates a motivated learning environment.
4. When using video game learning the teacher cannot be totally in control of everything going on within the computer lab.
5. In order to make video gaming learning work the teacher needs technical support with another adult in the computer lab.
6. Video game learning appeals to audio learners and visual learners at the same time.

These points were ones that the teachers saw as a way to improve their future video game experience. Their observations are insightful not only for their experience, but they take into account the experience of the student also.

Curriculum outcomes were discussed and the teachers were unanimous in agreeing that video games were best used by them to reinforce core-based curriculum outcomes already taught and achieved in the classroom; not to achieve new ones. The teachers found in their previous experience with video games, teaching new curriculum outcomes in that format was too hard for them. The combination of having the class too scattered in the lesson to achieve high enough success rates and the teacher having to repeat the lesson to each student individually was enough to dissuade them from using the video game format.

Heather: We use video games for reinforcement of curriculum outcomes it's too difficult to introduce new concepts in the computer lab.

As for the topic of the role of the teacher changing from leader in the classroom to the facilitator in the computer lab, the teachers made the following comments during the discussion:

1. Teachers felt like a bystander in the computer lab not part of the lesson.
2. Teachers felt more in charge in the classroom.
3. Teachers felt too much prep time needed for finding websites that contained video games which taught needed curriculum outcomes.
4. When the website was blocked by the server everything goes sideways in the lesson plan and the student's focus is quickly gone.
5. Too many things can happen with hardware or software in the computer lab and in the classroom, the book never disappoints you.

The last point brought forward in the discussion was the school computer server blocked many websites that the teacher had accessed at home, planned their lesson, and upon arriving at school the next day found the website to be blocked by the server: "access denied". The teacher's unanimous opinion was the school should teach responsible use of the technology and not try to block it with restrictions. A computer technician at a board office should not have the power to block websites from the entire school community and effectively control what the teacher teaches in their classroom using the internet. It's a form of pedagogical censorship that is very frustrating for the teachers. The school board technician's standard reply is; tell me the site you want opened up and we will open it. That sounds wonderful, but if you cannot explore any sites from your desk, it is an impossible situation leaving all the computer prep work to be done at home by the teacher.

Common Points

In keeping with the research questions the study digitally recorded answers from the personal interview, focus group questions, and from these recordings transcripts were created. Once the data was then transcribed it was cut up into statements all the while looking for

common points to appear. These common points were then glued on separate pieces of construction paper for thematic analysis. Themes were then adopted from the common points and broken down to five categories (color-coded for thematic analysis) that looked at the teacher's words for their experiences, knowledge, and their opinions so I could be reasonably sure (bias aside) of what they meant in regards to the teacher's pedagogical experience during the study. The five themes created from the common points were:

1. Advantages
2. Disadvantages
3. Compliment other resources
4. Make experience better
5. Role changes

Advantages

The advantages category revealed prior knowledge of computers as an important factor in allowing students to immediately source the desired game website without asking the teacher as Robin discussed their excellent ability to get there.

> Robin: Well the kids are really good at it [video games], they're pretty quick…the website was on the board when we went in so they knew where to go immediately.

Competitiveness was also mentioned by Heather as a driving factor amongst the students, which pushed them to compete against the video game and each other.

> Heather: …it's very competitive [the atmosphere] and I think it motivates them to do better because they can see who knows their facts and who does not.

Heather also mentioned the fact that the game forces the student's to self-correct their actions, which frees up time for the teacher to help out in other ways around the room.

Heather: ….and you do not have to go back and do corrections on a computer game.

Robin made the observation that in her classroom a few students just circle any answer or fill in the blank with any word to say they've finished. With the computer game their behavior was changed as they could not progress in the game with this type of behavior.

Robin: But it [video game] will stop them and make them go, [the student's response] no I know it's underlined, I'll try again, rather than underline, underline, underline, done.

If the students did try and push the button too many times, the video game just freezes up and their behavior is exposed to the teacher. These advantages were observed and mentioned by several teachers in the group which required the student to ask for help from the teacher to reset the game. Others made wrong choices while interacting with the video game, but were able to self-correct and move forward towards their goal within the video game.

Interactive seems to be the best word to describe the video game experience in the computer lab. Collins and Halverson (2009) uses this term to describe "a new way of learning that is a way of engaging students in "boring" content that otherwise would be hard to get them to learn" (p. 19). Even though the curriculum outcomes were the same as the classroom, the students had fun playing and learning with the video games. Collins and Halverson (2009) say as interactivity allows learners immediate feedback, which makes learners see the consequences of their learning decisions immediately or in complex games gives the users rich feedback on the consequences of a series of actions or a strategy for continued interaction. This is learning on the go at its best.

Disadvantages

The disadvantages category began with the focus of all teachers on the physical layout of the computer lab with the desire of having all the students facing the front so they could have all of their attention.

> Robin: Well, if they're all facing the same [direction like] they're supposed to be, they are all facing the same direction.

Margaret was bothered by the choices the students made in their own game selection as she felt they would not challenge themselves if left alone with their own choices.

> Margaret: They [the students] wanted something mindless…and they never challenge themselves.

Heather's point on disadvantages was that about controlling the student's attention.

> Heather: I thought I had their attention more in the classroom because they were focused on me. …in the computer lab they were all focused on their own computer.

Heather did not mention the learning platform had changed from a teacher-centered in the classroom to a student-centered platform when using video games. That made me wonder if she had not noticed the change or if she felt uncomfortable with it.

> Heather: I had to keep walking around to make sure they were all getting on the site and so on.

The disadvantages category also reflected what the teachers felt was wrong in their world view of teaching using video games. Their trusted pedagogical practices simply did not seem to work with the video game learning platform and they felt out of control in the computer lab. Their feeling of being out of control went against their personal pedagogical philosophy. The teacher in rote learning should be the controller and source of all knowledge in the classroom.

Prensky (2007) states “new digital technology is dictating not only our kid’s future, but also the new paradigm for educating them” (p. 3). He asserts his ideal of video games which are part of this new digital technology present an interesting conundrum for current educators who are not versed on how to use them as a learning platform and who are oblivious to the fact that they may be the pedagogical paradigm of the future. This quote summarizes the teacher’s experiences during the research as they looked outward for things that were not working, but did not self-reflect on their pedagogical practices.

Compliment Other Resources

The category of compliment other resources was meant to cover the teachers discussions on how video games tied into other pedagogical practice such as differentiated instruction, students with physical disabilities, auditory-visual learners, or ADHD-FASD students to name a few. In speaking to differentiated instruction, all video games used in the study contained verbs and nouns for the different participating grade levels. As the grade level increased the verbs and nouns became more comprehensive and challenging which allowed students to go at their own speed and ability.

To begin their discussion on complimenting other resources Margaret and Heather commented on how some video games gave the lower students who only knew about their home community, a frame of reference to use. These students have never left their community and some pictures triggered responses.

> Margaret: …so the video game in that instance was beneficial because they were seeing…they got to experience some landmarks.
>
> In regards to differentiated instruction Heather liked the fact that everybody was able to move along at their own ability.

Heather: …they can go at their own speed, so if they're learning it easily they can speed up or go to a higher level.

In having a special needs student who loved to touch and manipulate the curser or keyboard, Margaret commented on how busy and engaged he was. The auditory learner in Margaret's class also used the head phones to hear the lesson clearly.

Margaret: …the tactile learner, he likes the tactile experience of having a keyboard to manipulate.

Making the Experience Better

In the making the experience better category, all the teachers were quite adamant during the focus group discussions that in the future, when they do use video games again, all curriculum outcomes covered in the lesson were to be introduced and mastered in the classroom first. Their belief was that video game learning can be used but only to practice and re-enforce those outcomes learned first in the classroom from the teacher.

Robin: We do it here [classroom] first and then that's just more extra practice [in the computer lab].

Margaret: You can only use it [video games] for practice.

Heather: Activity that practices that concept [learned in the classroom].

By adopting this position the teachers have effectively rendered video game learning another tool to use to enforce rote learning, which further entrenches this 200 year old pedagogical practice deeper into the educational system. In the end, it is ultimately the teacher who dictates the type of pedagogical practice used in the classroom.

To make the pedagogical experience better Margaret advocated for a lab technician to teach the computer class much like a specialized music or gym teacher.

Margaret: First of all, [it would be better if] it was all set up when you walked in so there was not a classroom period wasted.

This would be a much more effective use of time and equipment in her opinion as teachers cannot be expected to know everything about computers.

Role Change

The last category found in the common points was role change. This category goes to the heart of the research study as the teachers could not let go of control of the students. Heather begins the conversation by comparing pedagogical practices in the classroom and the computer lab with these comments.

Heather: …I think there is a control issue, we feel more control here [in the classroom].

Heather: Everyone was looking away from me [in the computer lab] and I didn't have any, well I guess I could have had control over the seating arrangement.

Heather: I felt more like a bystander in the computer lab.

Traditional teacher pedagogy suggests that the teacher should be the foundation of knowledge and control in the classroom. They did not realize the classroom learning platform changed when using video games from a teacher-centered one to a student-centered place of learning that puts more responsibility on the student for their learning and they did not agree with the open atmosphere in the computer lab.

Heather: Here [the classroom] I felt I was in charge of what was going on, when I went there [the computer lab] I felt like I was more of a technician, they knew what to do.

Margaret: Yeah.

Lack of computer skills put the teachers on the spot as Margaret comments on her proficiency in the lab in responding to requests for assistance by the students.

> Margaret: Proficient enough to you know if that screen looks any different at all to me, then you know I have to get another student who knows what they're doing [to help the student].

This inability by the teacher to interface with computer issues as they come up during class stops computer illiterate teachers in their tracks and discourages video game learning in the classroom. The teachers simply refuse to use the computer lab if they feel frustrated with the technology.

Prensky (2009) says new digital learners need an alternative platform for learning, which uses the technologies available to them at this point in their lives to enrich their educational experience. You can see their cries for help in the media he says "all we need is more good teachers to teach" (p. 21). The problem with this thinking is most people mean good 20th century teachers whose drum roll is lecture, drill, study, and test. Prensky (2009) states this model of rote learning is becoming less and less effective with the new generation of digital learners as they disconnect a lot quicker in the classroom than their parents did.

Gender Differences

A question about the engagement level of boys versus girls was put into the interview and group questions to draw out a response about gender from the group of participants. The consensus from the participants was that boys were excelling in one area and the girls in another. After having been asked which group excelled more in the computer lab or the classroom during the study responses from the teachers were unanimous in favor of the boys in the computer lab and the girls in the classroom. Margaret was quick to answer as she was well aware of the gender differences.

> Margaret: The boys I find really seem to get more motivated in the computer lab.

Robin: Boys know their way around the computer because they have that experience from home.

Heather: Boys are really motivated by the video games, they love computers. One boy who was last in the class [lesson of verbs and nouns] was first in video games.

Margaret: I found it to be true boys wanted action games and girls wanted puzzles.

Bringing the video game experience from home seems to have given the boys the competitive advantage over the girls according to the teachers in this study. The boys really brought the social competition of video gaming to this study and had the class trying to beat each other in a multi-player format that allowed them to play each other all at the same time. The girls did not really seek out the action games like the boys, but like other games just as much often playing by themselves. An example Robin used was one boy from her class who was last in the classroom component of the research but first in the computer lab component involving video games. He was fully engaged, self-motivated, self-correcting, and assessed by the game completing the assignment first. All teachers agreed that, "the boys were really motivated by video games because they liked the action and the girls like puzzle games more." This type of gender stereotyping obviously requires more study, but the comment brought home the point the teachers were trying to make - the more action in the video game, the more engagement and achievement by the boys. The girls (the teachers commented) seemed to like games with more concrete results like puzzles or putting outfits on human figures.

Summary

This chapter on data analysis was meant to give the reader an overview of the data. The teacher's experiences, comments and opinions of the pedagogical practices in the classroom and the computer lab were the main source of information in this part of the study. From this

information transcripts were created and these transcripts revealed common points that grew into themes. The five themes used were; advantages, disadvantages, compliment other resources, make the experience better, and any role changes reflected on by the participants. Each category was insightful to the study because they each brought good viewpoints from the teachers as they discussed preferred pedagogical practices in the classroom and the computer lab. During this process I carefully looked at each comment before categorizing into a theme, weighing each for meaning and content all the while keeping the teachers viewpoints in mind.

The comments once broken down and categorized became an excellent source of information for the study. Each common point was separated until a theme emerged. The information from the comments was then glued to one of five sheets of construction paper. By using the thematic analysis I was able to tell exactly what the participants common points were trying say and get insights into which themes they belonged to.

CHAPTER FIVE

Findings

I have chosen to use a qualitative case study approach in this thesis to examine teacher perspectives when comparing video game learning to traditional pedagogical practices within the classroom. The teacher's assigned role in the study was to reflect on their own pedagogical experiences during the study after teaching a lesson in the classroom as they normally would, then repeating the lesson with the same outcomes using a video game in the computer lab. The teachers who participated in the study were all good teachers in their own right with very good classroom management skills. This allowed me to view their pedagogical practices in the classroom and the computer lab with little to no behavioral distractions to slow down the delivery of the lesson. Their experiences, perspectives, and opinions, provided valuable insights into reasons why current pedagogical practices are or are not used in achieving core curriculum outcomes using the video game learning platform during the school day.

Rather than focusing on the few teachers who are at the top of the technology field within the school and have learned to integrate technology into their classrooms, my concern was to work with teachers who were not at the forefront of innovative technology approaches. I wanted the study to reflect the pedagogical practices of the silent majority of teachers working within the system today. I was happy to have three teachers volunteer from grades three, four, and five who fit my volunteer criteria perfectly.

The study began with all participants in agreement with the outcomes of learning nouns and verbs. Each grade level would play the game, but at a progressively higher content level. The teachers taught the lesson in the classroom using their usual pedagogical practices and then followed up in the computer lab using a video game format. Each of the teachers participated in a

45 minute interview. A 60 minute group discussion with all participants was held at the end of the study. The teachers were surprisingly in agreement with all their issues they brought forward.

After the study was finished transcripts were created from all of the recordings during the interview questions and the focus group discussions. The common points that emerged from the research data were numerous. These common points were then glued together on construction paper and given a theme for analysis later. These themes that came out of the research were advantages or disadvantages, compliment other resources, make experience better, and role changes.

The study also looked at the many different learning situations within video games and how they relate to pedagogical practice within the classroom. The authors Bonk, (2009); Gee, (2005); Prensky, (2008); and Schaffer, (2005) to name a few, discuss how pedagogical practice should change when the video game platform is used. The one of their arguments was the teacher should move their pedagogical practices from a teacher-centered classroom to a student-centered one. In other words, the teacher is not the conduit of all knowledge and assessment in the classroom anymore, but becomes a facilitator to the student and the video game.

Transitioning to the video game platform allows the student to become more responsible for their learning with skills such as self-correction and strategizing. These games are looked upon as learning communities that teach the players to quickly value the skills they learn and use the terminology from the game to interact with other players. These learning communities give a direct experience to the player on what it is like to be a City Planner, Soldier, Doctor, Inventory Controller, etc. One quickly realizes after playing these video games, how easily these skills sets and terminology are transferable to the real world digital economy where in just a few short years these students will be participants.

The remaining part of this chapter discusses the common points brought forward by the research when comparing traditional pedagogical practice in the classroom and pedagogical practices used when trying to achieve the same outcomes using the video game platform. Implications are then brought forward on what these themes add up to and the question of 'What changes should be made as a result of this study?' is answered. A conclusion for the study follows, which discusses results of the study and some recommendations going forward.

Advantages or Disadvantages

The study supported the viewpoints that video games did bring some advantages and disadvantages to the learning environment. In my professional experience, traditional pedagogical practices used by the teachers in this study favor students who can memorize information in a transparent order such as sequential learners. Sequential learners thrive in traditional pedagogical practice like rote learning, which delivers the lecture, study, and test format they excel at. Any other learning style such as abstract learners, struggle inside this pedagogical box because they do not have the memorization skills needed to be successful. The advantage video games bring to this situation is that they allow different types of learners to be successful while using the same content format for all learners. This is achieved by allowing different pathways to success through which learners complete similar outcomes.

Even if the video game platform was used by schools today the problem comes when assessment is needed. Video game learning does not interface with traditional assessment, which traditional education relies on to show accountability in the classroom. Traditional testing assesses the cognitive domain of the student and not the affective domain. We as teachers are teaching a new digital generation of learners in the old ways of rote learning, using the

pedagogical paradigms that produce a final product, which is out of date before the learner finishes it.

The advantages of video games helping all learners cover curriculum are important to this study as they show that games can be inclusive for all learners by playing at different educational levels according to the abilities of the learners. In the computer lab I saw students with audio and visual impairments use headphones and screen magnifiers that allowed them to participate in the given lesson as the technology adapted to suit their needs. Inclusion for all students is the rule for this new form of learning.

The data provided some positive views on video game learning. Robin commented on the student's ability to get to the website quickly because their hours logged on at home gave them these skills. These comments discussed such things as competitiveness and video games self-correcting the students and allowing them to try learning the outcomes again without delay. Immediate feedback was another advantage that is an important part of the learning cycle.

Competitiveness was mentioned by Heather as a driving factor amongst the students, which pushed them to compete against the video game and each other.

Heather: …it's very competitive [the atmosphere] and I think it motivates them to do better because they can see who knows their facts and who doesn't.

Heather also mentioned the fact that the game forces the student's to self-correct their actions, which frees up time for the teacher to help out in other ways in the room.

Heather: ….and you don't have to go back and do corrections on a computer game.

Teachers had many concerns about the disadvantages of using video games for learning in the classroom. These concerns were directed at the teacher's role in video game learning and all agreed it was a very stressful experience for them due to various reasons. One concern of the

teachers was their lack of digital skills, which was exposed every time a student had a hardware or software problem. They said that if there was any delay or problem in the computer lab the student lost their focus very easily.

In my own observations, I noticed the teachers struggling with the physical layout of the lab as they could not control the student's attention. In the classroom all the desks were pointed to the front of the room. In the lab the chairs all face the wall where the computers were and they had to repeat themselves more times in the computer lab when compared to the classroom. Another disadvantage was that many students went to different websites and although it looked like they were working from across the room, upon further examination by the teacher the website they were on was not related to the current outcome they were supposed to be working on. This upset the teachers as they were not on task.

Making the Experience Better

Common points in the data revealed some interesting comments on pedagogical practice. All the teachers were quite adamant in their opinion that when they do use video games again, all curriculum outcomes covered in the lesson can be introduced and mastered in the classroom first. Only then can video game learning be used, but only to practice and re-enforce those said outcomes learned first in the classroom from the teacher. All three teachers comment on this decision to teach outcomes first in the classroom.

> Robin: We do it here [learn outcomes in the classroom] first and then that's just more extra practice [video games in the computer lab].
>
> Margaret: You can only use it [video games] for practice.
>
> Heather: Activity [video games] that practices that concept [in the lab].

By adopting this position the teachers have effectively rendered video game learning as another tool to use to enforce rote learning, which further entrenches this 200 year old pedagogical practice deeper into the educational system. One of my impressions during the time in the computer lab was that one of the problems was that the teachers did not trust the technology.

To make the pedagogical experience better, Margaret advocated for a lab technician to teach the computer class much like a specialized music or gym teacher. This would be a much more effective use of time and equipment in her opinion as her prior experience at a different school left teaching in the computer lab to a specialist. This specialist had the time to develop computer skills that could easily keep the class on task and achieve the right curriculum outcomes. Computer labs with no computer technician can leave the teacher with no technological compass or support to develop lesson plans for the students. This leaves the teacher to rely on their own digital skills and prior experience to deliver a lesson with mixed results. The teachers used the examples of Music and Physical Education being specialty teaching areas, which in the not too distant past classroom teachers were responsible for all these areas until the system realized you cannot find teachers who can do it all. The teachers were unanimous when they said the computer lab should be treated the same way as these other electives with a specialized teacher assigned to the computer lab that can continually upgrade their skills and be a specialist. Hopefully in the future these concerns regarding the computer lab can be acted on to build a better understanding and more comprehensive computer usage by the education system.

In my own observations, I think the teacher's need to change their pedagogy to allow the students more control of the choice of game played. This can be achieved by getting the student's to show the teacher the outcomes they want them to learn are contained within the

selected game. This type of release of control by the teacher allows the classroom to become more student centered with the student's taking on more responsibility for their learning.

Preferred Pedagogical Practices

From the beginning of the study the teachers wanted to introduce the verbs and nouns lesson in their classroom before students had an opportunity to play the video game. I tried to get them to bring their classes into the computer lab first then to their classroom but they were unanimous in their refusal to do it my way. I relented for the sake of the study to run as their preferred pedagogical practice was to introduce the outcomes in the classroom first and then the lab. The reasoning of Margaret, Heather, and Robin was that all three teacher's prior experiences with control of the students in the computer lab dictated that it is easier for them to introduce the outcomes in the classroom first.

> Robin: If we were going into the computer lab first I would have them sitting at their desks first because it's much easier to have them [the student's] focused and paying attention here [in the classroom] when their all facing the same direction. In the computer lab they are all facing different directions [which leads to loss of control]. The teacher controls the pace in the classroom.
>
> Margaret: In the classroom if there were any students not paying attention……I could quickly pull them back in.
>
> Heather: I felt I had their attention more in the classroom….they were focused on me. In the computer lab they were focused on their computer.

In all three of my classroom observations, the teacher's pedagogy demanded the absolute attention from all of the students. As a practicing teacher I understand that their training taught them total control is essential, but if they considered a more student centered classroom they

would have the video game learning platform work for them and not against them because the student would be more empowered and accountable for their learning.

The new digital learners need a different platform for learning, which uses the technologies available to them at this point in their lives to enrich their educational experience. With society as a whole embracing digital technologies, the question must be asked why education cannot use this digital learning platform with its readymade learning communities, to send graduates into the world to be more productive and resourceful members of our society. The answer, in my opinion, is that this digital generation will eventually take control of the education system and change the focus of education to use this digital learning platform.

Role Changes

Common points from the data that focused on role changes by the teachers during the study repeated the same interesting points. In quotes and in my observations, the teachers did not recognize the need to change their role in the computer lab learning environment to adapt to the different digital learning format that video game learning brings to the classroom. Concerns were bought up by all teachers as roles changed considerably (without them realizing it) from one of total control by the teacher in the classroom, to one of facilitator within the lab guiding the students. In the lab it bothered the teachers that they did not have full control of all students all the time as their training taught them to control all aspects of learning in the room. The teachers blamed other variables in the study for their pedagogical problems in the computer lab, like the physical room, the video games, or even the students, but definitely not their pedagogical practice as they knew it worked in their classroom ten minutes previously. All three teachers did not recognize the need to give control of the lesson back to the student and embrace their new

role as facilitator within the video game learning platform. It was interesting to see this information come out of their discussions during the thematic analysis.

During the interview discussions, the conversation by the teachers like Heather and Robin always went back to "in the classroom I have more control in what the students are doing". In my viewpoint this issue was not just a control issue; it went deeper than that into how established pedagogical practice does not work in the video game environment. It was very interesting to see how the teachers all defended their preferred pedagogical practice and all agreed video game learning just was not suited for learning new curriculum outcomes, but for reinforcement of ones that have all ready been achieved. The thought of learning new pedagogical practice was never mentioned as that would force them to abandon their preferred pedagogical practice. So the consensus by the teachers was not to change pedagogical practice to conform to new technology, but to let technology be used to suit established practice that in which they are comfortable.

Implications

Ultimately, the question of "What changes should be made as the result of this study?" should be answered to encourage change in the future. School policy has been put in place to encourage teachers to use the established pedagogical practice as the standard of practice within the classroom. Using proven methods that work in the classroom is good thinking, but the video game learning platform requires a different pedagogical practice that encourages a relationship between the student, teacher, and video game. Changes that should be made as a result of this study include; pedagogical adaptations, additional research and policy changes.

Pedagogical Adaptations

In order to use the video game learning platform to its full potential change is needed in how teachers are trained in the field during their student placements. Student teachers need to be trained to use different pedagogical practices that can be used to deliver curriculum outcomes on different learning platforms with the same or better results. We in the teaching profession need to be trained to respond to new technologies that are brought into the classroom and be aware that we can change our pedagogical practices to use these technologies to their full potential.

As the video game platform becomes more accepted pedagogical practice in classrooms, the big winners will be the students who have a different learning style other than sequential memorization. Students who have other learning styles such as abstract learners put information such as literacy, numeracy, and socialization skills together differently and video games allow them to do just that.

In order for video game learning to be used in the classroom changes need to be made in the daily classroom. These changes can only take place when organizational and structural changes are also implemented that look at professional development for all the stakeholders to learn pedagogical practices with the video game learning platform. Every day the need grows for educational systems to respond in more productive and creative ways. The new uses of technology are providing spaces for teachers to interact more with students to provide true engagement activities that are measured not with traditional testing, but in better pedagogical practices and longer student engagement.

Additional Research

Studies looking at gender, comparing student responses to numbers vs. letters, or the colors in the background of the video game all could effect how the lesson plan is formatted and

pedagogical practices used by the teacher. The study looking at gender could not only compare scores between girls and boys, but the specific type of game each gender would excel at in comparison to the other group. Identifying a preferred video game for a gender would give the teacher a sweet spot to use during pedagogy.

The study looking at number games vs. letter games could help the teacher identify learning styles of students. Teachers could find different video games covering the same content using numbers or letters to achieve the same outcomes. Maybe some students can stretch their learning styles by using the format they are least comfortable in.

A study looking at the visual stimuli such as colors in the background of a video game played would be interesting. Visual stimuli during a video game play a role in keeping the interest of the player. Boys might have more success than girls or the opposite during game play. This kind of study can set the playing field for the learner to be more successful without them knowing about it. Using the preferred learning format of the learner hopefully can help more students be successful.

Policy Changes

In order for video game learning to be used more in the classroom changes need to be made to school policies. The participants of this study could have clearly benefited from a policy that would mandate professional development opportunities for teachers on how to use video games to teach curriculum outcomes. If teachers are encouraged by their peers to go outside this box and challenge themselves using new technologies maybe new pedagogy can be developed to further video game learning. Also during the study, one participant was an advocate for having a policy of having a trained teacher who specializes in computer technology (like video games) in every school which would also go a long way in establishing better pedagogy with video game

learning. Every day the need grows for educational systems to respond to new technologies in more productive and creative ways. The new uses of technology are providing spaces for teachers to interact more with students to provide true engagement activities that are measured not with traditional testing, but in better pedagogical practices and longer student engagement.

Conclusion

In conclusion, the research study revealed the video game learning platform turned the teacher's preferred current pedagogical model upside down. Video games changed the stakeholder's roles during the lesson from a teacher-led experience to a student-led one; the feeling of loss of control from the teacher group was a repetitive theme during the individual and group interviews. The teachers seem to have a hard time during the study making the needed switch from lecturer to facilitator. During the study teachers submissions readily acknowledge in the recorded interviews that they "feel out of control" or "can't keep track of everyone" in the classroom using the video game platform. Maybe this is why a lot of educators are not interested in using the video game learning platform as they are oblivious to the fact they must change their pedagogical practices to make the video game experience work for them and not against them. The stressful experience seems to make them view the computer lab as another training challenge they do not have time to learn during their busy day.

The research questions that were used during the study kept the focus of the study on the teacher's current pedagogical practices. They in effect drove the research forward looking for answers to questions that helped build an understanding of the traditional teacher's pedagogical practices and the need for new ones that can interface with video game learning. Video game learning is such a different learning platform from rote learning as new skill sets for digital learning have emerged that enables most learners to be successful. These students can use their

new skill sets not only in the cognitive domain of knowing, analyzing, and evaluating, but in the affective domain of becoming aware, believing, and using values.

Every day the need grows for educational systems to respond in more productive and creative ways demanded by the world economy. Universities do respond to these demands by doing research and creating courses, such as integrating technology into the classroom, that give student educators new skills to keep up to this economy. Change to the field of education will come by many methods; two of these are research and new courses developed. Research like this study helps in giving video game learning a bigger profile, and gives future researchers something to build on. The second method is students learning from new courses that bring new pedagogy into the field and passing on what works in their classroom to other educators. In the end, there is a bright future for the video game learning platform as I feel an education system must always mirror the society it serves and our society loves video games.

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Appendix A

Interview Questions

The goal of this short interview is to gather information from the participants regarding their pedagogical experiences and to build an understanding of best pedagogical practice while using video games.

1. When comparing your pedagogical classroom practices to video game learning, did you see any differences in student engagement during the lessons?
2. What digital learning skills do you think were developed by learners while playing video games?
3. What was the most awkward part of the experience?
4. As far as student information retention goes, what percent of the class do you think retained information from the experience?
5. Do you think there was a gender factor relating to student success?
6. Do you feel curriculum outcomes were reached by video game learning?
7. In the future, would you use video games to teach curriculum outcomes with your class?

Appendix B

Focus Group Questions

The focus group discussion will be held once all participants have completed the video game lesson and interviews. The goal of the focus group discussion will be to discuss their pedagogical experiences in the study and their personal opinions about the use of video games in education and whether or not it has changed as a result of their participation.

1. Now that you have had a chance to compare video game learning to your classroom pedagogical practices, do you see any specific advantages or disadvantages the students are exposed to during both types of learning?
2. In terms of classroom resources, do you see video game learning complementing any existing classroom resources or practices now being used by you or your colleagues?
3. If core-based curriculum outcomes were achieved through video game learning, what pedagogical practices can be used by the teacher to not only enhance the learning experience for the students, but also the teacher?
4. During the class session, were their moments that you felt awkward and not fully in charge of the lesson?
5. Would you do more video game learning to achieve more curriculum outcomes? If so why or why not?
6. Do you feel your role as the teacher in the classroom was changed during the video game experience? If so why?

Appendix C

Brandon University Oath of Confidentiality

I, _____ affirm that I will not disclose or make known any matter or thing related to the participants that comes to my knowledge during this research project.

_____ _____

Participant Date

_____ _____

Signature of Witness Date

Appendix D

Research Project Participant Invitation

Project Title: An Examination of Pedagogical Practice in the Context of Video Games

You are invited to review this letter of initial contact to participate in a research study to compare current pedagogical practice within your classroom to video game pedagogical practice in the computer lab. This research study wants to help build an understanding of best pedagogy during video game learning and is being conducted by Leo Landers through Brandon University's Faculty of Education Program under the guidance of Dr. Jackie Kirk. The study will consist of four parts:

1. A 60 minute planning block and a 45 minute teaching block.
2. Focus group (60 minute discussion).
3. Interview (45 minutes)
4. A personal log for recording comments regarding the experience.

Your decision to participate or decline participation in this study is completely voluntary and you have the right to terminate your participation at any time without penalty. You may skip any portion of the study, and you also may skip any questions you do not wish to answer.

You will be asked to reflect on your everyday instructional practice within your classroom. Your participation in this research will be completely confidential and data will be reported in aggregate. The findings of the study will be used by Mr. Landers to extend his body of research used in his thesis regarding pedagogical practices during video game learning and will be shared with Brandon University's Faculty of Education. The results also may be used to support research articles for publication or presentations at conferences. Although your

participation in this research may not benefit you personally, it will help us understand what role video gaming can have in pedagogical practice in the classroom of the future.

If you have any questions about this project, you may contact Leo Landers at 1-204-679-6108 (landerl194@brandonu.ca), Dr. Jackie Kirk at 1-204-571-8576 (kirk@brandonu.ca) or Brandon University Research Ethics Committee 1-204-728-7340 (burec@brandonu.ca). I have read and understand the above invitation form and certify that I am 18 years old or older. By signing the invitation form I indicate my willingness to voluntarily take part in the Learning in the context of Video Game research study.

Leo Landers_____ Date:_____

Prof. Jackie Kirk_____ Date:_____

Appendix E

School Permission Form

To: Principal Greenwood School

Thompson, Manitoba

Re: Proposed Research Project

Project Title: An Examination of Pedagogical Practice in the Context of Video Games

Dear, Principal

I am writing to you to ask permission to conduct research within Deerwood School classrooms for the purpose of completing my master's degree in education through Brandon University's Faculty of Education. The research consists of examining pedagogical practices in the classroom and the computer lab. It is my intent to focus on core-curriculum outcomes that are contained within the video game learning and also taught in the classroom to build an understanding for best pedagogical practices that can be used in the future with video games.

The participants from Deerwood School will be invited on a volunteer basis with them being allowed to end their participation at any time with no consequences. I am the sole researcher in the study under the direction of Dr. Jackie Kirk from the Brandon University's Faculty of Education. The study will consist of four parts:

1. A 60 minute planning block and a 45 minute teaching block.
2. Focus group (60 minute discussion).
3. Interview (45 minute discussion).
4. A personal log for recording comments regarding the experience.

The findings of the study will be used in my master's thesis for Brandon University's Faculty of Education and it will help us understand what role video gaming can have in pedagogical practice in the classroom of the future. If you have any questions about this project you may contact Leo Landers at 1-204-679-6108 (landerl194@brandonu.ca), Dr. Jackie Kirk at 1-204-571-8576 (kirk@brandonu.ca) or Brandon University Research Ethics Committee 1-204-728-7340 (burec@brandonu.ca).

Thank-You

Leo Landers Date:

Dr. Jackie Kirk Date:

Appendix F

Research Project Participant Consent Form

Project Title: An Examination of Pedagogical Practice in the Context of Video Games

You are invited to participate in a research study to "Examine Learning in the Context of Video Games". The purpose of the study is to build an understanding of pedagogical practice and video games. If you do choose to be a volunteer participant in the study the following points need to be brought to your attention so you know what will happen during the study:

1. You are free to participate in this study or to choose not to participate in this study.
2. You can withdraw from this study at any time without repercussion.
3. If at any time you choose to withdraw from the study, you can also request to withdraw any data that you formerly contributed to the study.
4. Consent will be an ongoing process in this study. You will be asked to consent to participation in the interviews, interview, the log book, and the focus group prior to participating in each step.
5. There will be minimal risk to participants in this study. You will be asked to provide your opinions about how video game learning compares to more traditional classroom practices.
6. This research will involve only a small group of participants who are known to each other. So, it may be possible to identify you by your comments. To provide anonymity, pseudonyms will be used to protect your identity.
7. Upon completion of the research, the findings will be available to you at your request by contacting the researcher. The findings from this study will be published as a

Master's Thesis by Brandon University and may also be disseminated publicly in the form of conference presentations or publications.

8. This research will not proceed until consent has been granted by all participants.
9. Your interviews will be recorded and then transcribed into text. I will provide copies of the transcripts for your perusal and I will ask you to confirm that the transcripts accurately represent your perspectives before I proceed with utilizing your transcripts in the data analysis for this study.
10. All data storage, retention, and disposal of data will be considered confidential in nature with access restricted to the researcher (Leo Landers) only.
11. Every consideration for the participant's safety has been considered as research will occur only in your classroom and the computer lab.
12. As a willing volunteer you need to sign this form each time you have an audio-tape interview, take a interview, or participate in a focus group.
13. By giving consent the participants have not waived any rights to legal recourse in the event of research-related harm.

This research is being conducted by Leo Landers under the guidance of Dr. Jackie Kirk for the purpose of obtaining a Masters' of Education degree from Brandon University.

Time needed to complete each aspect of the research includes:

1. A 60 minute planning block and a 45 minute teaching block.
2. Focus group (60 minute discussion).
3. Interview (45 minute discussion).
4. A personal log for recording comments regarding the experience.

Your decision to participate or decline participation in this study is completely voluntary and you have the right to terminate your participation at any time without penalty. You may skip any portion of the study; you also may skip any questions you do not wish to answer.

Audio-Taped Interview:

Participant: Date:

Focus Groups:

Participant: Date:

Interview:

Participant: Date:

I have read and understand the above consent form, I certify that I am 18 years old or older and, by signing the consent form, I indicate my willing to participate. All participants will receive a copy of the consent form. If you have any questions about this project, you may contact Leo Landers at 1-204-679-6108 (landerl194@brandonu.ca), Dr. Jackie Kirk at 1-204-571-8576 (kirk@brandonu.ca) or Brandon University Research Ethics Committee at 1-204-728-7340 (burec@brandonu.ca)

Thank-You

Leo Landers Date:

Dr. Jackie Kirk Date:

Appendix G

District Permission Form

To: School Board

School District

Re: Proposed Research Project

Project Title: An Examination of Pedagogical Practice in the Context of Video Games

To whom it may concern;

I am writing to you to ask permission to conduct research within Deerwood School classrooms for the purpose of completing my master's degree in education through Brandon University's Faculty of Education. The research consists of examining the teacher's reflections on their pedagogical practices through interviews, focus group discussions, and observations by me. It is my intent during the study to focus on pedagogical practices used in the classroom and the computer lab that will hopefully build an understanding of better pedagogical practices for teachers when using video games in the classroom. The participants from Deerwood School will be invited on a volunteer basis with them being allowed to end their participation at any time with no consequences.

I am the sole researcher in the study under the direction of Dr. Jackie Kirk from the Brandon University's Faculty of Education. The study will consist of four parts:

1. A 60 minute planning block and a 45 minute teaching block.
2. Focus group (60 minute discussion).
3. Interview (45 minute discussion)
4. A personal log for recording comments regarding the experience.

The findings of the study will be used in my master's thesis for Brandon University's Faculty of Education and it will help us understand what role video gaming can have in influencing pedagogical practice in the classroom of the future. If you have any questions about this project, you may contact Leo Landers at 1-204-679-6108 (landerl194@brandonu.ca), Dr. Jackie Kirk at 1-204-571-8576 (kirk@brandonu.ca) or Brandon University Research Ethics Committee 1-204-728-7340 (burec@brandonu.ca).

Thank-You

Leo Landers Date:

Dr. Jackie Kirk Date: