INQUIRY-BASED LEARNING:

FACT OR FALLACY?

By

Alison Wells

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Department of Educational Administration, Foundations and Psychology
University of Manitoba
Winnipeg, Manitoba

ABSTRACT

Inquiry-based learning (IBL) has existed since the early 1500's and research points to it being a successful pedagogy, so why do so few educators use it? One reason may be the confusion found in the literature encountered by educators. The literature review of inquiry revealed that a concise definition of IBL or, a common understanding of how to implement it could not be found. IBL was presented as a philosophy of teaching, a teaching practice, inclusive, or not inclusive, and was often used concurrently with terms such as: problem-based learning, experiential learning, and co-operative learning. In light of this confusion, how teachers defined and implemented IBL in diverse, 21st Century classrooms was investigated. Looking at whether IBL was, or could be, an inclusive practice was also researched. Furthermore, the possibility that inquiry-based learning (IBL) encompassed differentiated instruction (DI) in its implementation and could therefore be used as a process to incorporate both was explored.

To investigate these ideas, current literature was reviewed; including the works of John Dewey and Lev Vygotsky, and a qualitative research project was conducted using a phenomenological method. The research consisted of observations and interviews in the natural setting, of an inclusive elementary classroom.

The following are the findings from the above mentioned investigation: 1) defining IBL can be an elusive task, 2) IBL can be an inclusive pedagogy, 3) IBL does encompass the tenets of DI and could be used as a process to encompass both and, 4) IBL is a positive pedagogy grounded in a constructivist paradigm that will keep students engaged as they gain new knowledge.

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DEDICATION

I dedicate this thesis to my parents, Peter and Sally Wells, who inspired me to be a lifelong

learner by their example. My dad will not see me graduate, but I know he would have been so

proud of me. My mom has been, and continues to be my biggest cheerleader, and has listened

to countless hours of my hypothesizing and thinking out loud. For this I am ever grateful!

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CHAPTER 1

Introduction and Theoretical Framework

Developmental psychologists and researchers in neuroscience have given us a rich and complex picture of how children grow and learn, and their findings confirm what visionary educators of the early twentieth century, such as ... John Dewey ... discovered on their own: young people achieve healthy, productive maturity by interacting freely, actively and purposefully with their world, engaging their senses, feelings and desires as well as their minds. We know now ... that the process of human learning and growth is holistic, creative, and spontaneous (Miller, 2008, p. 21).

Holistic, creative and spontaneous are not words that would typically come to mind when describing traditional teaching practices born from an industrial mindset. Practices that found students sitting for long periods of time listening to a teacher impart knowledge, perhaps interspersed with readings from a textbook. Such practices do not engage students living in the 21st century (Peterson and Hittie, 2003) and need to be changed.

Dewey, a "philosopher and leading representative of pragmatism in American education" (Knoll, 1997, p. 5) challenged the industrial mindset of education in the late 19th century because he did not believe that children learned through "acquisition of … organized bodies of information and prepared forms of skill" (Dewey, 1938, p. 18). In contrast he believed that "there is an intimate and necessary relation between the processes of actual experience and education" (Dewey, 1938, p.20). Dewey viewed school life as an extension of the community and the society in which the child lived. In Dewey's mind, school could not exist separately from society. He defined society as a place where people worked together

towards common goals and understanding. Communication was the key to a society becoming more than a group of individuals living along side each other (Dewey, 1900).

When Dewey began observing students in classrooms, during the late 19th century he did not see children communicating with each other or working towards a common set of goals or aims. He saw an education system that operated outside the realm of the student's real life experiences and natural growth cycle. He noticed passive classrooms, where adults imposed ideas that children had no experience with and therefore could not relate to (Dewey, 1938).

Schools of Dewey's time focused on developing and training a child for his/her future. Dewey argued this was wrong, as the focus needed to be on the child as a child not as a future adult. He was strongly convinced of this idea as evidenced in his Pedagogic Creed: "education, therefore, is a process of living and not a preparation for future living. School must represent present life – life as real and vital to the child as that which he carries on in the home, in the neighbourhood, or on the playground" (Dewey, 1897, p.6). Dewey advocated for a school system that represented real life. Life that was actively constructed, allowed for lots of communication and socializing, and a curriculum based on the child's interests and experiences (Dewey, 1897).

Dewey was not the only educator of the early 20th century who challenged the classroom environment. A young, Russian, intellect, and psychologist named Lev Vygotsky challenged many of the psychological beliefs of his era. Vygotsky, who died at the age of thirty-eight, wrote over one hundred books and articles during his brief lifetime. His work was banned in Russia for many years and until recently was not available to the general public. In the last thirty years, some of his work has been translated into English. He believed that all of

a child's experiences were part of his or her cultural environment and could not be separated from it.

Vygotsky understood that "every function in a child's cultural development appear[ed] twice: first on the social level and later on the individual level; first between people (interpsychological) and then inside the child (intrapsychological)" (1978, p. 57). He believed that "higher mental processes" (Woolfolk, 2001, p. 44) were co-constructed through the interactions a child had, prior to being internalized by the child (Woolfolk, 2001). Vygotsky boldly claimed that "only when the child is interacting with people in his environment and in cooperation with his peers" did genuine learning take place (Vygotsky, 1978, p. 90).

Vygotsky is considered by many to be the founding father of social constructivism. "For social constructivists, the process of knowing has as its roots social interaction. … Thus, learning from a social constructivist perspective is an active process involving others" (Jones and Brader-Araje, 2002, p. 6). He based his ideas on the sociocultural theory which "emphasize[d] [the] role … of cooperative dialogues between children and more knowledgeable members of society" (Woolfolk, 2001, p.44).

Dewey and Vygotsky, both adhered to beliefs that embraced a philosophy of constructivism. In a constructivist theory, learning is facilitated through social interaction, shared thought, and decision making (Eggen and Kauchak, 1997).

> Constructivism is a view of learning that sees learners as active participants who construct their own understandings of the world around them. Using past experiences and knowledge, learners make sense of the new information that they are receiving. ... constructivism also asserts that meaningful learning occurs within authentic learning tasks (Brown and Adams, p. 3, 2001).

One form of constructivist learning referenced in the literature is Inquiry-Based Learning (IBL). IBL has a very "long and distinguished history" in the form of the "project" (Knoll, 1997, p.2). The "project" method grew out of the architectural and engineering movement in Italy during the 16th Century and continues to exist as a pedagalogical practice today. Even with such a long history and varied research pointing towards IBL as an "equivalent or slightly better … model of instruction for producing gains in general academic achievement" (Thomas, 2000, p. 34) it is not widely used in North American classrooms. "Meaningful inquiry and exploratory dialogue [is] so rare in [North] American schools, despite the fact that leading researchers agree that they are essential to student learning" (Wilhelm, 207, p. 19). Why inquiry-based learning is not used widely warrants further research and prompted my study.

Personal Journey

I first graduated from University in 1980 with a Bachelor of Education. I was part of the whole language, holistic generation of educators who believed in socially constructed learning. Over the years, the whole language community has expanded its concepts by looking for larger patterns in learning and living.

> In 1988, it was revolutionary to think of 'literacy' as more than reading and writing, yet the whole language community [was] thinking of literacy as the ability to communicate successfully in all variety of contexts and for many purposes. … The whole language community has morphed [curriculum] … to a word that means a co-constructed learning process, the shared life of students and teachers in classrooms (Berghoff, Egawa, Harste, and Hoonan, 2000, p.ix).

When I began my Post Baccalaureate studies and learned of Lev Vygotsky, his theories made a lot of sense to me. It was enlightening to discover an educator who thought that social interaction was not only a good thing, but vital to learning. Social interaction was far from vital in my early years of school. My earliest memories include being told I talked too much and asked too many questions and of being in the hallway too often. Much of what I was expected to do seemed repetitive and boring so at least the social interaction made school bearable, but it was not a place I thrived as a learner. There was no co-construction of learning with my teachers. They told me what I needed to know, when I needed to know it and did not appreciate being questioned by a student.

As I continued at University and began my first Master's course I was introduced to the work of Loris Malaguzzi and John Dewey, two social constructivists ahead of their time. It interested me that John Dewey introduced the concept of aim-based, project learning over one hundred years ago, and it is still something being discussed by educators today. Malaguzzi started preschools based on his beliefs, as the Second World War was ending. During that same era Vygotsky was writing prolifically about socially constructed learning. Everything I read by Dewey, Vygotsky and Malaguzzi pointed towards me being a social constructivist too.

By the fall of 2007, I returned to teaching, and found myself in a grade two-three bilingual program teaching the entire English curriculum in the afternoons. Out of sheer desperation I turned to projects to incorporate cross-curricular outcomes. I wanted the learning to be authentic and interesting to my students so one project was based on conversations that had taken place in the classroom for weeks. One student talked about becoming the manger of his own mall. Very quickly all the students wanted to work for him and run various stores. I incorporated this idea and spent three months working alongside the students co-constructing

a mall. This turned into a great unit and covered many math, language arts, information technology, science, and art outcomes. The students were so proud of their mall and thrilled when they got to spend a couple of afternoons "shopping." I began documenting my students learning. I took many photos of the project from beginning to end and placed them in the classroom with an explanation of what each step encompassed.

Later in the year I was asked to team teach with a colleague who taught grade three and four, in order to explore an inquiry-based approach together. I had twelve students, five with special needs, and my partner had twenty-two students, three with special needs. This was my first experience with inquiry. We started in January and at the end of May when I walked through the three spaces we used, I saw all the small groups working on their second inquiry. Some groups were gathered around a laptop looking for information they needed, others were working on a poster for their final presentation, one group was creating a rap song and dance moves, and yet another group was discussing whether the lyrics to a song they wanted to play were appropriate for their classmates to listen to. A couple of students continued to struggle with the group setting and still preferred to work alone or away from their group. If we had a little more time I think all the students would have felt comfortable in the setting we created. Hopefully as they felt more secure they might have been prepared to take more risks. Seeing some students struggle in an inquiry-based environment made me question whether IBL was an inclusive practice.

As I lived through and studied an inquiry-based approach, I started to wonder why more of my colleagues were not using an inquiry approach in their classrooms. My students were engaged in the classroom and I was less stressed about covering the curriculum as individual units of instruction. As I changed roles and became a Learning Support Teacher, I

wondered if inquiry-based learning could help my colleagues who were struggling with differentiating successfully.

During my final master's course I was required to conduct a research project, so I chose to further gain insight into how educators define and implement IBL. The project netted some great information but, instead of answering my questions it left me wondering about so many more. For this thesis I decided to continue my personal inquiry about inquiry-based learning and expand my research.

Webster's dictionary defines inquiry as a "systematic search for the truth or facts about something" (Merriam-Webster) Synonyms for inquiry include "delving, examination, exploration, inquest, inquisition, investigation, probe, probing, research, and study" (Merriam-Webster).

As I began this thesis, these words guided my journey as I: (1) delved into the multiple meanings and explanations of inquiry, (2) examined how educators implement inquiry in their classrooms, (3) explored how children with disabilities are included in an inquiry-based classroom, (4) carried out an inquest with the people whose lives are impacted by inquiry in the classrooms, (5) investigated whether inquiry is a process or a philosophy, and 6) probed further the idea that IBL incorporates differentiated instruction, by studying literature on inquiry and conducting a phenomenological study.

Professional Significance

In 1961 the Organisation for Economic Co-operation and Development (OECD) was created, with Canada as one of its members. Members of OECD agreed to promote policies that would contribute to the development of the world economy, economic development, and the expansion of world trade (OECD, 2004) In a document drafted by the OECD in 2003, they

evaluated how well students were performing in school especially in areas like problem-solving skills. They defined problem-solving as: "the capacity of students to understand problems situated in novel and cross-curricular settings, to identify relevant information or constraints, to represent possible alternatives or solution paths, to develop solution strategies, and to solve problems and communicate the solutions" (OECD, 2004, p. 3). The problem-solving concepts identified by OECD are, essentially, the basic tenets of inquiry-based-learning.

The Programme for International Student Assessment (PISA) conducted the assessment across all member countries of OECD including an assessment of students' problem-solving skills. The results showed that: "[a]bout one in five 15-year-olds in OECD countries can be considered a reflective, communicative problem solver. These students are able not only to analyse a situation and make decisions, they are also capable of managing multiple conditions simultaneously. They can think about the underlying relationships in a problem, solve it systematically, check their work and communicate the results" (OECD, 2004, p.4). This provides evidence, that an inquiry-based approach should be put into practice in Canadian classrooms today. Students need to develop the flexible and creative problem solving skills that will be required in the 21st Century.

According to educational reformist Ron Miller (2008), "education is the act of making meaning of our experience" (p.20) and it needs to "cultivate habits of reflection, critical inquiry, and compassionate discrimination" (p.25). Research pointed towards IBL as a way of cultivating these habits so it is a worthwhile topic of investigation in light of the diversity found in classrooms today. Keeping in mind this diversity I planned to investigate how inclusive a model inquiry-based learning was.

Purpose

The purpose of this study was to investigate the definition and implementation practices of inquiry-based learning in an inclusive, elementary, classroom, in an urban setting. The research was guided by the following questions:

1. How is inquiry-based learning defined as a philosophy or a teaching method?

    a) How does the definition impact implementation?

    b) How are teacher and student roles defined and implemented?

    c) How does the definition impact the use of curriculum?

2. Do educators consider IBL an innate way of differentiating instruction? How is this demonstrated?

3. Is IBL an inclusive practice?

The research was analyzed through the lens of social-constructivism encompassing the thoughts, ideas, and principles of social-constructivism provided by Fosnot (1996):

Constructivism is fundamentally nonpositivist ... Rather than behaviours or skills as the goal of instruction, concept development and deep understanding are the foci..." (p. 10). "Implied ... is the idea that we as human beings have no access to an objective reality since we are constructing our version of it, while at the same time transforming it and ourselves" (p.23). [It is a] theory about learning, not a description of teaching" (p.29).

Principles include:

1) Learning is not the result of development; learning is development.

2) Teachers need to allow learners to raise their own questions, generate their own hypothesis and modes as possibilities, and test them for viability.

3) Disequilibrium facilitates learning.

4) Reflective abstraction is the driving force of learning.

5) Dialogue within a community engenders further thinking.

6) Learners are responsible for defending, proving, justifying, and communicating their ideas to the classroom community.

7) Learning proceeds toward the development of structures. As learners struggle to make meaning, progressive structural shifts in perspective are constructed – in a sense, "big ideas." (p. 29)

Methodology

I conducted a single-site, phenomenological research study. According to McMillan (2008) a phenomenological methodology is used in order to gather and interpret lived experiences of various participants within the same phenomenon. Each participant may have a different experience but each is within the realm of reality for that participant. McMillan (2008) indicated that participants in a phenomenological study are chosen because of their experience with the particular phenomenon being researched. Since the phenomenon in this study is inquiry-based learning I chose a classroom where the teacher indicated they had ongoing experience with the phenomenon.

Many of the key terms that will be used have various meanings; therefore I define each to reflect the context in which they will be used in this text. These definitions can be found in the Glossary and are discussed in the Literature Review presented in Chapter 2.

CHAPTER 2

Literature Review

The important thing is not to stop questioning. Curiosity has its own reason for

existing.

~Albert Einstein.

This literature review is guided by the purposes of the study: (1) to investigate the

definitions and implementation practices of Inquiry-Based Learning (IBL), (2) to explore

whether IBL is an innate way of differentiating instruction, and, (3) to examine whether IBL is

an inclusive practice.

Historically there has been confusion about what IBL really is. This confusion is based

partially on the varying terms used, but also on the degrees of understanding concerning the

concept. Inquiry-based learning will be used in this text as an umbrella term (as per the

definition provided in Chapter one) encompassing the terms: project-based learning, student-

centered learning, and experiential learning. Consideration of the fact that each of these terms

has a slightly different definition has been given. Yet, these differing terms are connected by

the tenets of a constructivist paradigm. Therefore, inquiry-based learning will be the sole term

used for the remainder of this text unless a different term is part of an original quote.

The literature review will begin with a short history of IBL, followed by the influence

of John Dewey and Lev Vygotsky on IBL. Next an overview of some of the definitions of IBL

will be presented along with an outline of the roles of both teacher and student in an IBL

classroom. A comparison of the principles of inquiry-based learning and differentiated

instruction (DI) are offered with a suggestion, that if an educator follows the tenets of IBL

they will be innately differentiating instruction. The chapter concludes with a discussion about

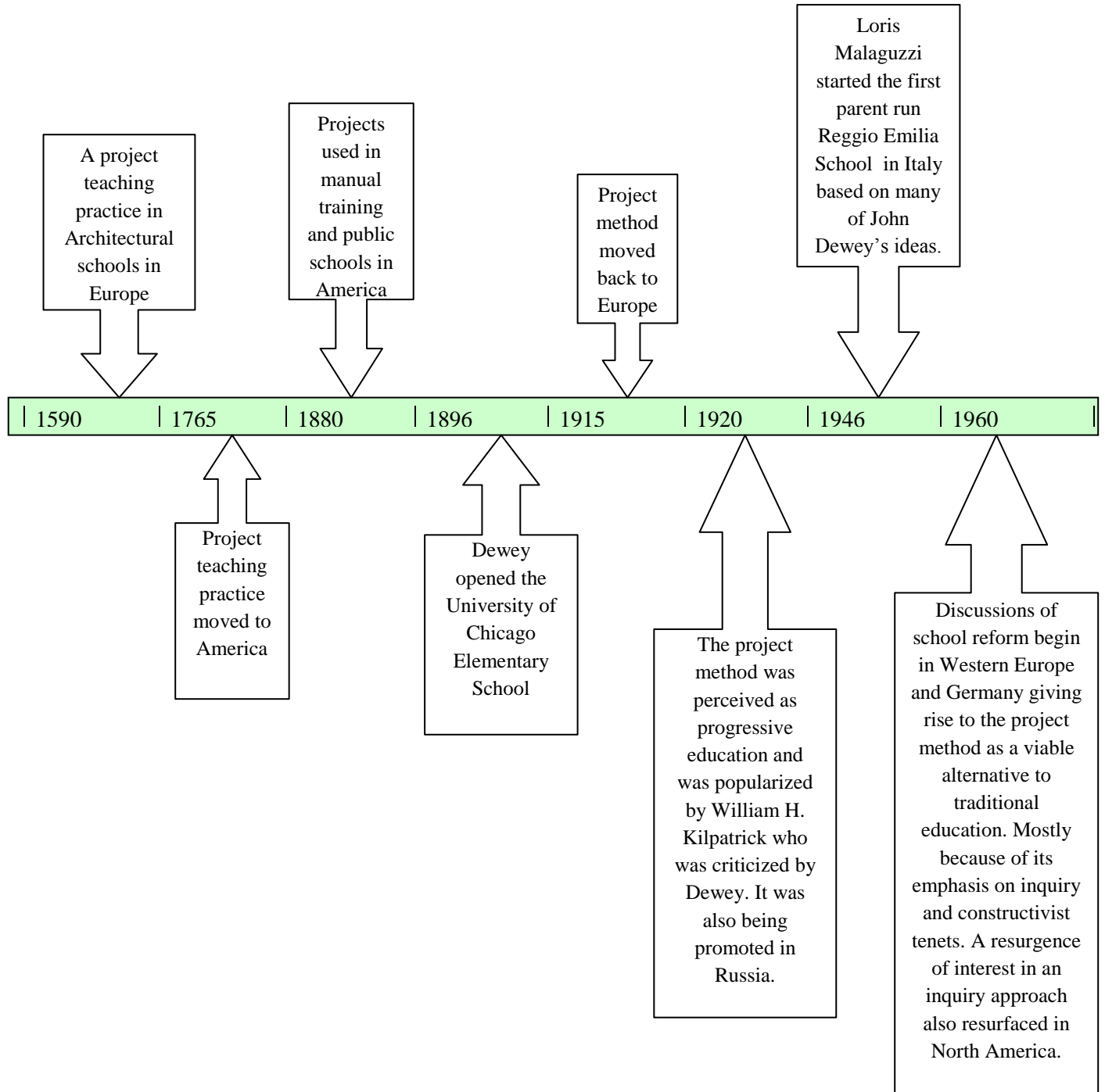the inclusive nature of IBL.

History of Inquiry-Based Learning

A review of the literature regarding Inquiry-Based Learning (IBL) revealed the use of

IBL spanning several centuries. A brief timeline of the history of IBL is presented in table 1.

Table 1

A History of Inquiry-Based Learning and It's Use in Schools

Dewey (1990), Edwards, Gandini, and Forman (1998), and Knoll (1997)

| 1590 | 1765 | 1880 | 1896 | 1915 | 1920 | 1946 | 1960 |

A project teaching practice in Architectural schools in Europe

Projects used in manual training and public schools in America

Project method moved back to Europe

Loris Malaguzzi started the first parent run Reggio Emilia School in Italy based on many of John Dewey's ideas.

Project teaching practice moved to America

Dewey opened the University of Chicago Elementary School

The project method was perceived as progressive education and was popularized by William H. Kilpatrick who was criticized by Dewey. It was also being promoted in Russia.

Discussions of school reform begin in Western Europe and Germany giving rise to the project method as a viable alternative to traditional education. Mostly because of its emphasis on inquiry and constructivist tenets. A resurgence of interest in an inquiry approach also resurfaced in North America.

Michael Knoll (1997) found evidence of "the project" dating back to 1590, when it was utilized as a standard teaching practice in the architectural schools of Europe. Two hundred years later the engineering profession incorporated learning with projects into their European and American schools. In 1879, Calvin M. Woodward the Dean of the O'Fallon Polytechnic Institute at Washington University, "proposed moving training in the handicrafts down from the college to the secondary school level" (Knoll, 1997, p. 5). This was the beginning of project-based learning in American public schools. By 1890, it was introduced into elementary schools with "the view that manual training should be based on the interests and experiences of the child" (Knoll, 1997, p. 5). This view that was popularized by John Dewey in the early 1900's.

John Dewey, a pragmatist and social constructivist, argued that education must be experience based. However this was not what he saw in the traditional classrooms of his time. "There is very little place in the traditional schoolroom for the child to work. The workshop, the laboratory, the materials, the tools with which the child may construct, create, and actively inquire, and even the requisite space, have been for the most part lacking" (Dewey, 1990, p.32). Dewey saw passive students in classrooms set up for many hours of listening, which meant that the children had to leave their natural impulses and experiences at the door as they arrived at school each day. Impulses like moving, experimenting, self-expression, observation, imagination, communication, constructing, investigating, and inquiring (Dewey, 1990).

These traditional classrooms created a climate counter to democracy, something Dewey vehemently challenged. Neither the teacher nor students were allowed to function in a democratic way. The curriculum, and methodology, were chosen and directed by a small group of men who had no experience in a classroom setting. Educators of the time were

deemed incompetent to make such decisions so they had no say in the teaching materials or methods used in their classrooms. Teachers used the readymade materials of the day so they passed on knowledge in a passive way. Students, were not allowed to have freedom of thought or, given opportunity for any hands-on experiences as they were taught (Dewey, 1903). Dewey believed that children needed to actively engage in their learning:

> Every schoolroom from the lowest primary grade up should be supplied with gas, water, certain chemical substances and reagents. To experiment in the sense of trying things or to see what will happen is the most natural business of the child; it is, indeed, his chief concern. ... Add to these three typical modes of active experimenting, various forms of art expression, beginning with music, clay-modeling, and story-telling as foundation elements, and passing on to drawing, painting, designing in various mediums, we have a range of forces and materials which connect at every point with the child's natural needs and powers, and which supply the requisites for building up his experience upon all sides (Dewey, 1903, p.202).

He stated "education must be conceived as a continuing reconstruction of experience; that the process and the goal of education are one and the same thing" (Dewey, 1897, p18). Dewey believed that school needed to be an extension of the child's natural life and needed to become the child's "habitat" (Dewey, 1990, p.18). Within this habitat, Dewey thought that children were naturally active, social, inquisitive beings, who simply needed some direction to their activities (1990). This direction is what Dewey referred to as aims.

"An aim implies an orderly and ordered activity, one in which order consists in the progressive completing of a process" (Dewey, 2005, p.62). Dewey believed that aims always had results and that without order or guidance aims could become opaque or "capricious"

leaving the student with a lack of direction. In fact Dewey referred to this as "fatal" to the

students learning (2005, p. 61). He established criteria for good aims: (1) aims needed to be

based on "existing conditions" established through observation and prior experience, (2) there

needed to be a tentative plan which was flexible enough to change throughout the process, (3)

an aim had an end in sight which ultimately could be used to establish a new aim (Dewey,

2005). "An educational aim must be founded upon the intrinsic activities and needs

(including original instincts and acquired habits) of the given individual to be educated"

(Dewey, 2005, p. 65).

Dewey promoted the need for discipline in the inquiry process. He defined discipline

as "power at command; mastery of the resources available for carrying through the action

undertaken. … Discipline is positive" (Dewey, 2005, p.77). Dewey was of the opinion that the

a child's experience also had bearing on their learning. "The fallacy consists in supposing that

we can begin with ready-made subject matter of arithmetic, or geography, or whatever,

irrespective of some direct personal experience of a situation" (Dewey 2005, p.91).

Dewey believed so strongly in the impact of experience he wrote; "an individual must

actually try in play or work, to do something with material in carrying out his own impulsive

activity" (Dewey, 2005, p.92). He recognized however, that not all experiences were equal,

and not all experiences were educative. Some experiences could actually be mis-educative. In

his book *Experience and Education (1897),* Dewey described the following mis-educative

experiences:

> How many students, for example, were rendered callous to ideas, and how many lost
>
> the impetus to learn because of the way in which learning was experienced by them?
>
> How many acquired special skills by means of automatic drill so that their power of

judgment and capacity to act intelligently in new situations was limited? How many

came to associate the learning process with ennui and boredom? How many found

what they did learn so foreign to the situations of life outside the school as to give

them no power of control over the latter? How many came to associate books with dull

drudgery, so that they were "conditioned" to all but flashy reading matter? (p.26).

In 1910, Dewey recommended the use of inquiry in the kindergarten to grade twelve

science curriculums (Barrow, 2006). He firmly believed that students should be actively

involved in their learning with a teacher who acted as a guide and facilitator. In 1937,

Dewey's model of science learning "was the basis for the Commission on Secondary School

Curriculum" (Barrow, 2006, p. 266).

Since Dewey's model was incorporated, inquiry-based learning has been redefined

numerous times and has had varying degrees of popularity amongst educators. In 1957,

Sputnik was launched which resulted in the science curriculum in American schools being re-

evaluated. Educator Joseph Schwab thought that science education should reflect the current

day practices of science so he advocated for students to get experience in the laboratory

immediately, not after they had gained knowledge from a textbook. Schwab believed this

would allow and even encourage students to "ask questions and begin the process of

collecting evidence and constructing explanations"

(http://science.education.nih.gov/supplements/nih6/inquiry/guide/info_process-a.htm).

Schwab's recommendation was to use an inquiry approach when teaching science echoing

what Dewey said several decades earlier (Barrow, 206, p. 266).

Confusion around how to teach science using inquiry continued well into the 20th

Century. So the American Association for the Advancement of Science (AAAS) developed a

document establishing what all students should know about science by the time they graduated

from grade 12. This document was called Project 2061 and outlined eight recommendations

for teaching science using an inquiry approach. It became increasingly obvious to the AAAS

that teachers who had a pre-sputnik view of inquiry held different beliefs from those teachers

who had been trained and in the field for less than ten years, or post-sputnik (Barrow, 2006).

This sense of confusion about how to define and implement IBL is still evident in

current literature. There are a myriad of definitions and explanations about what IBL is and is

not which may leave educators dismayed and bewildered.

Some educators, like Dewey (1996), Vygotsky (2006), Apps & Carter (2006) and

Gilbert (2009), consider IBL grounded in the philosophy of a constructivist paradigm, while

others like Mills and Donnelly (2001), viewed inquiry "as a philosophical stance rather than a

set of strategies, activities, or a particular teaching method" (p. xviii). In contrast, Wilhelm

(2007) and Chu, Tse, Loh, Chow, Fung, & Rex (2008) defined IBL as a process, and others

like Bell (2010), Crick (2009), and Chang & Wang (2009) defined IBL as an approach to

learning.

Defining Inquiry-Based learning?

Defining IBL appears to be an elusive task confronting those who read and write about

the topic. There is not enough room in this paper to report all the definitions found in the

literature. Therefore, I have chosen several that present the various ways IBL is defined and

or described, in order to establish a basis for the confusion evident amongst educators

today.

- Inquiry-Based Learning, according to Kahn and O'Rourke (2005), is a "broad

  umbrella term to describe approaches that are driven by a process of inquiry" (p. 1)

- According to Yilmaz (2008), it is based on the constructivist paradigm touted by John Dewey and others that posits …

  knowledge is not passively received from the world or from authoritative sources but constructed by individuals or groups making sense of their experiential worlds. … Learners are intellectually generative individuals (with the capacity to pose questions, solve problems, and construct theories and knowledge) rather than empty vessels waiting to be filled (p. 162).

- Berghoff, Egawa, Harste, and Hoonan (2000) defined inquiry as being:

  like literacy and curriculum, [having] multifaceted meaning[s]. On one level, inquiry means learning driven by the learner's personal question or questions. There are always questions. … Our questions originate from what we already know, and we pursue them by making predictions, examining assumptions, gathering more information, and seeking alternative perspectives and new possibilities. In essence inquiry is learning. … Inquiry is a way of knowing, a willingness to undergo a journey, to tolerate ambiguity, to sort through multiple perspectives, and to trust abduction - those leaps of insights that totally restructure what is known. Inquiry ... refers to the social process of collaborative inquiry (p. ix).

- Newell (2003) defined IBL as a process that:

  Emphasizes student interest rather than following a fixed curriculum; emphasizes a broad interdisciplinary focus rather than a narrow, discipline-based focus; uses direct, primary, or original sources rather than texts, lectures,

and secondary sources; emphasizes data and materials developed by students

rather than teacher (p.5).

- Settlage (as quoted by Howes, Lim, and Campos, 2007) defined inquiry as a "set of

   student skills, stating that 'we should abandon efforts to teach *by* inquiry in favour of

   teaching *for* inquiry'" (p.190).

As the reader quickly ascertains, there is no real agreement amongst the above

authors on how to define IBL. Further investigation of the literature, will add find even more

confusion to the theoretical construct of IBL.

Many educators would quickly state that IBL follows a constructivist model. The

constructivist approach underscores the social–interactive nature of learning and views

children as active and engaged learners who construct meaning by selecting, organizing,

connecting, and understanding information, ideas, and concepts as a consequence of prior

knowledge and experience (Montague, 2003, p. 166). However, Powell and Kalina (2009)

pointed out that the word constructivist has many different meanings to educators. Whether a

teacher follows a social-constructivist or cognitive-constructivist theory will greatly impact

how they use an inquiry-based approach. Powell and Kalina argued that, in order to be

effective, the teacher actually needed to use methods from both theories. If the premise is that

IBL is a teaching method grounded in a constructivist paradigm it would be helpful to know

which constructivist group IBL falls into, social-constructivism or cognitive-construction,

both or other constructivist ideals. Without this fundamental understanding using an IBL

pedagogy may end in disaster or become "opaque and capricious" as Dewey suggested (2005,

p.61).

Educators, such as Vygotsky, believed that learning needed to take place in a social context

and that it became enhanced through social contact. He also believed that collaboration and

cooperation were vital to constructing knowledge in the classroom (Powell and Kalina, 2009),

making him a social-constructivist like Dewey. Vygotsky stressed that both language and

thought originated from the societal setting of a child (Vygotsky, 1978). Vygotsky believed

that thought and language developed simultaneously although from different roots. This is an

example of how Vygotsky applied dialectical synthesis to his work. Dialectical synthesis

means to take a particular perspective and the opposing views and synthesize them into a new

idea. "Vygotsky maintained that the child's external self-focused speech during activities did

not disappear. Instead, through a dialectical transformation, it became inner speech that guided

the child's planning and other emerging thought processes"

(http://education.stateuniversity.com/pages/2539/Vygotsky-Lev-1896-1934.html).

Through many observations he concluded that speech was essential to a child solving any

given task. If speaking was restricted while a child tried to solve a task it greatly inhibited

their ability to solve the given task (Vygotsky, 1978).

After extensive examination of the relationship between development and learning in

children, Vygotsky disagreed with all other theories that existed in the early 1900's. He

developed a new theory called the Zone of Proximal Development (ZPD). Vygotsky believed

that children had an "actual developmental level" based on cognitive abilities determined by a

set of standardized tests. A child left on his own to solve a problem could be expected to solve

it at his own developmental level. Vygotsky discovered that if a child was given adult

guidance or allowed to work in collaboration with a more capable peer, he was able to solve

problems beyond his level of development. Students who worked in groups and collaborated

with others were able to achieve more together than they were alone (Vygotsky, 1978). This

difference in ability is what Vygotsky referred to as the ZPD.

Dewey and Vygotsky's ideas and beliefs differed from the cognitive-constructivist

ideas of psychologist Jean Piaget. Piaget focused on the "individuality" of constructing

knowledge. Piaget proposed that children go through four stages of development: (1) the

sensorimotor stage, (2) pre-operational stage, (3) concrete operational stage and (4) formal

operational stage. While journeying through these stages the child constructed their own

schemas largely in isolation from others (Powell & Kalina, 2009, p. 242).

Within the literature reviewed, there are authors who agree with Vygotsky, Dewey or

Piaget. In some cases, constructivism is referred to but not clearly defined as Powell and

Kalina (2009) state, "constructivism is a vague concept, but is currently discussed in many

schools as the best method of teaching and learning. For many educators and teachers it has a

variety of meanings" (p.241). This adds to the confusion about how to define and implement

IBL in the classroom. Researchers like Rapp, (2005) clearly believe that IBL falls under the

theory of social constructivism as defined by Lev Vygotsky (p.298). Kahn and O'Rourke

(2005) undoubtedly indicate the necessity for social interchange in their definition of Inquiry-

Based Leaning. They state that students "seek evidence to support their ideas … either as part

of a group or as an individual supported by others. … [T]he whole experience becomes one of

interchange where students share opinions …" (p.1).

Barrett (2005) considered IBL a "total educational strategy" not as a "mere teaching

and learning technique" (p. 13). Within this total approach to education, Barret viewed IBL as

a social enterprise. In his operational definition he stated that once students are presented with

a problem their first strategy is to "discuss the problem in small group[s]" then after

independent study, they come back to their small groups to "share information, peer teach, and work together on the problem" (p. 15). He adds that IBL "is best carried out in small teams" (p. 17). So his concept of IBL is grounded in social-constructions of knowledge.

Professors of science education, Leonard and Penick (2009), wrote that in "real inquiry" students observed, predicted, questioned, formulated, and analyzed before they "share[d] ideas, results, and inferences with a group that provide[d] feedback" (p. 41). For Leonard and Penick (2009), only when "students communicate[d] their findings and ideas with others" did their work become true inquiry (p.41). Clearly they would align themselves with Vygotsky and Dewey's concept of constructivism.

Scruggs and Mastropieri (2007), wrote about several advantages of using a constructivist model: "emphasis on the concrete, meaningful experiences; an emphasis on depth of learning, less on rote verbal learning; and use of performance assessment rather than paper-and –pencil tests" (p.59). This was in contrast to what they considered content-driven models. A content-driven model included "substantial vocabulary learning, ... learning and recall of large amounts of factual content, lecture and worksheet activities, and independent study from text. Content-driven models typically emphasize breadth over depth of learning, and the acquisition of factual material (Scruggs and Mastropieri, 2007, p.59).
Kirschner, Sweller, and Clark (2006), disagreed with a constructivist model and supported a content-driven, or direct instruction model. They defined direct instruction as "providing information that fully explains the concepts and procedures that students are required to learn as well as learning strategy support that is compatible with human cognitive architecture. Learning, in turn, is defined as a change in long-term memory" (p. 75). They believed that using a constructivist approach shifted the "emphasis away from teaching a discipline as a

body of knowledge toward an exclusive emphasis on learning a discipline by experiencing the

processes and procedures" (Kirschner, Sweller and Clark, p. 78). Mayer (2004) agreed with

Kirschner, Sweller and Clark. He reviewed literature from 1950 to the late 1980's and

compared direct-instruction models with what he referred to as unguided-instruction which

included IBL. His conclusion was that the "debate about discovery has been replayed many

times in education but each time, the evidence has favoured a guided approach to learning

(Mayer, 2004, p.18). Mayer did not equate a constructivist approach to learning with a pure-

discovery model, he stated that "the formula *constructivism = hands-on activity* is a formula

for educational disaster (2004, p.17). Mayer believed that a discovery approach needed to be

guided and that educators needed to refer to "contribution of psychology is to help move

educational reform efforts from the fuzzy and unproductive world of educational ideology-

which sometimes hides under the banner of various versions of constructivism - to

the sharp and productive world of theory-based research on how people learn" (2004, p.18).

Turkmen (2009) investigated how students learned by researching the use of a

technology based inquiry approach (TBIA) with a group of fifth grade students. He referred to

inquiry as "learning through a constructivist model of learning" (p. 3). At first it was hard to

determine which form of constructivism he was referring to. He started off by saying that

"knowledge is constructed by learners who do many activities on their own in order to build

new knowledge" (p. 3). He theorized that a teacher needed to create a supportive environment

where "students [could] work collaboratively in small and large groups and learn to respect

each other's ideas" (p. 3). Turkmen explained that TBIA is "active learning" and that

"collaboration is important" when using this technology. In his concluding comments

however, he wrote "inquiry is the umbrella concept partnered with teaching and learning. It

includes many teaching and learning methods and techniques to increase students'

motivation" (p. 13).

Perhaps Turkmen was more on target, IBL does include different teaching methods

and should be considered an umbrella concept as Kahn and O'Rourke suggested. However,

"developing [an] appropriate constructivist practice that combines the social, cognitive, and

content related aspects that meet the needs of all students is an exceedingly difficult task"

(Gilbert, 2009, p. 432).

Gilbert appeared to agree with Wilhelm (2007), who wrote "one problem with the term

inquiry is that it can carry associations of unwieldy, time-consuming, student-centered

projects that collapse despite good intentions" (p. 12). He further wrote that "student-centered

projects aren't inquiry. Nor is inquiry synonymous with a student-generated curriculum,

wherein students are completely in the driver's seat" (p. 13).

Yet, researchers like Chu, Tse, Loh, Chow, Fung and Rex (2008) from Hong Kong,

and Berghoff, Egawa, Harste, and Hoonan (2000) emphasized that IBL is a student-centered

approach. The education Bureau of Hong Kong SAR Government stated that one of the

components of an IBL approach is that students "take a proactive role in the learning process

to construct knowledge" (p.3).

Kahn and O'Rourke (2005) also emphasized that students are pursuing "their own

lines of enquiry, drawing on their existing knowledge" (p. 1). One of their key characteristics

of inquiry is that "students direct the lines of enquiry and the methods employed" (p. 2).

Bell (2010) referred to IBL as a "student driven, teacher facilitated approach to

learning. [Where] learners pursue knowledge by asking questions that have piqued their

natural curiosity" (p. 39). She said that "student choice is a key element of this approach"

(p.39). Again we find a mixed message about IBL. Is it student driven or not, and if so, how much control does the student have over the process? Should IBL be grounded in curriculum or in the interests of the students? These questions compound the confusion found in answering the questions already proposed: Is IBL socially constructed or cognitively constructed? Is it a teaching methodology or philosophical stance?

There seemed to be a distinction in the literature about how IBL is implemented in the classroom. Educators like Bell (2010), Chu, Tse, Loh, Chow, Fung, and Rex, (2008), Leonard and Penick (2009), all viewed IBL as a teaching method focusing on teaching specific subjects like social studies and science or for doing a certain project over a specified time. Others viewed IBL as a philosophical stance such as Barret (2005), Mills and Donnelly (2001), and Parker (2007), and had tenets of their philosophy permeating through cross-curricular outcomes.

Some authors have attempted to address this confusion about the approach and implementation of an inquiry-based pedagogy. Authors like Parker (2007), who viewed inquiry as "a way of looking at the world, a questioning stance we take when we seek to learn something we don't yet know" (p. 1). She added "an inquiry-based curriculum is a 'back-to-basics' curriculum" (p. 1). However, this does not mean that an inquiry-based classroom is restricted by "predetermined curricular boundaries", nor does it mean that no planning is required. Parker (2007), stated that one of the biggest misconceptions about IBL is that no planning is required because the teacher just follows the students' lead. Parker (2007), argued that planning for IBL was indeed necessary and that a teacher in that environment needed to "know learners, learning, content, and [how to] continually try to link these in ways that will

enable … students to learn" (p.13). Parker (2007), stressed that the teacher is the ultimate decision maker even though he or she learns alongside his or her students.

The view of inquiry as a philosophy rather than a teaching method is held by Mills and Donnelly (2001), who defined IBL as a "philosophical stance rather than a set of strategies, activities, or a particular teaching method" (p. xviii). Mills and Donnelly (2001), believed in their philosophy so strongly that they developed a school where they could practice what they believed. They started the Center for Inquiry in 1997 in Columbia, South Carolina. Barret, (2005) agreed with Mills and Donnelly (2001), as he considered IBL "essentially a philosophical position in relation to knowledge in higher education" (p. 20).

No wonder there is misunderstanding about inquiry-based learning. In the literature, there is no clear definition of IBL. This should not be surprising, considering no agreement is found about the type of constructivist paradigm that should ground IBL or whether IBL is a teaching method or philosophical. Clearly, how educators define IBL will impact how they implement it and view their role in their classroom.

This leads to the question of how the roles of teachers and students are defined under IBL? "Many people have questioned whether the role of [teachers] is any different in problem-based learning compared with lecture-base approaches" (Savin-Baden & Major, 2004, p. 93). Savin-Baden and Major propose that there is a difference based on a teacher's definition of IBL. They established in their own research that "when teachers … designed programmes with problem-based learning as the central curriculum strategy the effect on roles is likely to be greater than where the problem-based learning has been adopted within one module" (p.93).

Role of the teacher in an IBL classroom

The role of the teacher or educator in the IBL classroom was discussed in some of the literature about IBL by: (Newell, (2003), Savin-Baden and Major (2004), Glassman and Whaley (2000), Powell and Kalina (2009), Kahn and O'Rourke (2005), Barrett (2005), Leonard and Pinick, (2009) Turkman, (2009), Wilhelm (2007), Parker (2007), Mills and Donelly, (2001), and Thomas (2000). Several reoccurring ideas in the descriptions found in the literature were: (1) the teacher is responsible for ensuring students' inquiries are focused and moving forward, (2) the teacher must create an environment where inquiry and social interaction can occur, (3) the teacher needs to assume that position of co-learner with his or her students, (4) the teacher should be a facilitator or guide to the students (i.e., it is not the teacher's job to just give the students answers but rather to point students in the right direction to discover answers on their own, and finally (5) the teacher needs to allow sufficient time for inquiry to occur.

Dewey, suggested that inquiry is based on a set of aims, believed that the teacher's role was to "maintain some control of the aims" so the child didn't get lost in the discovery process (Glassman and Whaley, 2000, p. 6). Maintaining control meant determining whether the activities chosen by the child would help him or her maintain focus and ultimately reach the aim he or she had already established. "The teacher must recognize and accept any number of directions the activity may take and be flexible enough to appreciate and welcome a direction that did not occur to him or her" (Glassman and Whaley, 2000, p. 7). It was not the teacher's place to lead the child, it was their job to create an environment where the child would develop "creativity and discipline" in their learning. Dewey also saw the teacher's role as one of helping students understand that as one aim was achieved it set the stage for the next aim,

signifying that learning was a fluid process that never ended (Glassman and Whaley, 2000, p. 8). Dewey believed that the teacher needed to become a co-learner with this or her students. Dewey likened the teacher to a lighthouse, an illuminator of the child's journey, a guide to the process. He wrote that "children and adults should be able to use each other's strengths in the development of activity, to feed off each other and become co-creators in true joint venture" (Glassman and Whaley, 2000, p. 17).

Vygotsky (1978) believed that learning took place where others such as the teacher, could support the learning process through social interaction. This support is often called scaffolding; a term often equated with Vygotsky however this was not a term he used. Scaffolding in educational terms, has been credited to David Wood, Jerry Bruner and Gail Ross. They used the term in an article written in 1976, *The Role of Tutoring in Problem Solving*. They defined scaffolding as, "a process that enables a child or a novice to solve a problem, carry out a task or achieve a goal which would be beyond his assisted efforts" (p. 90). The main purpose of scaffolding is to reduce the amount of frustration a student might feel when faced with any assignment in any subject that was outside of their ZPD. Krajcik, Blumenfeld, Marx, Bass, Fredericks and Soloway (1998) found that middle year's students needed multiple supports, or scaffolding, throughout an inquiry process.

> We need to consider a range of scaffolds from teachers, peers, and technology that can aid students in examining scientific worth of questions, the merits of their designs and data collection plans, the adequacy and systematicity of their conduct of the investigation, and the accuracy of their data analyses and conclusions (Krajcik, Blumenfeld, Marx, Bass, Fredericks and Soloway, 1998, p. 348).

Vygotsky was also a determined advocate for social interaction in the classroom.

Therefore, a teacher needed to promote lots of positive dialogue, and to encourage the use of

language in a variety of ways such as: having discussions, holding debates, and even reading

materials out loud. Teachers also needed to provide authentic learning experiences for their

students making sure that examples are real to them and had some meaning in the students'

lives (Powell and Kalina, 2009).

      Kahn and O'Rourke, (2005) and Savin-Baden and Major, (2004) described the teacher

as the facilitator of the process. First the teacher or facilitator needed to establish a task and

then support the students as they pursued their own line of inquiry. The curriculum was the

basis for the tasks but it was structured as a series of problems to be solved rather that a

"systematic presentation of subject content" (p. 3). A teacher needed to help establish

timelines for the completion of inquiries and may need to intervene to ensure an inquiry

stayed on track (Kahn & O'Rourke, 2005, p.6). This was the same concept as Dewey's of the

teacher being a guide or facilitator.

      Barret (2005) presented a similar description of the teacher to that of Kahn &

O'Rourke (2005). He stated that the role of the tutor or teacher is to listen attentively, ask

stimulating questions and generally facilitate the inquiry process. In the section of his article

entitled "Ways to be a great PBL facilitator" he suggested: being interested and enthusiastic,

forgetting about lecturing, being tolerant of silence, encouraging collaboration amongst the

students, remaining focused on the learning outcomes, and promoting accurate content in the

resources students find (Barret, 2005, p. 19).

      Leonard and Penick (2009) also described the role of the teacher as a guide and

provider of authentic real-life inquiry activities for the students. Leonard and Penick (2009)

agreed that the teacher needed to listen attentively to his or her students and then respond in

encouraging ways. They further stated that the teacher should: "create a safe, stimulating environment…ask questions that require thinking … promote multiple and creative ideas… place value on student communication, diversity, individuality, and intellectual freedom" (p. 41).

Another author who agreed with many of the teachers responsibilities already presented was Turkman (2009). He too believed that a teacher needed to establish a rich environment where students felt empowered to take on more responsibility for their own learning. He also wrote about the importance of the social interaction of the students and how a teacher needed to create an atmosphere where students felt respected during the collaborative process. The teacher was to "interact with his or her students as well as listen to them so he or she could pose appropriate questions to guide the inquiry process" (p.3).

A comprehensive look at the teacher's role in an IBL classroom is presented by Wilhelm (2007) in the second chapter of his book entitled: *Rediscovering the passion of teaching and power of understanding* (p. 21-40). The following were his suggestions for using an inquiry approach:

- discover problems worth pursuing
- help students make connections by identifying communities they already belong to and new communities they are going to learn about (the idea of building on existing schemas or constructing new knowledge based on existing knowledge)
- model, mentor and monitor student performance
- become a co-collaborator with your students

- use a multisided model of the collaboration that will happen between student and

  teacher, student and other students, student and the content being studied, and between

  the student, the content and the authentic connections they will make with their world

- be a guide and facilitator

- allow enough time for the inquiry

Wilhelm echoed (2007) the ideas of Turkman (2009) , Barret (2005) , Kahn and

O'Rourke (2005), Leonard and Penick (2009), Vygotsky (1978) and Dewey (1938) ,

Glassman and Whaley, (2000), Parker (2007), and Teele (1996).

Teele suggested that teachers should be role models for their students in the areas of

"collaboration, respect and appreciation for differences." Teachers need to be co-learners

alongside their students "willing to take risks" and share their "talents, gifts, and resources"

with the students (Teel, 1996, p.72). Teachers need to teach "content through problem-

solving, critical and creative thinking, and applications of knowledge that encourage student

achievement from comprehension to analysis, evaluation and synthesis of information"

(Teele, 1996, p. 71).

"Many people have questioned whether the role of [teachers] is any different in

[inquiry]-based learning compared with lecture-based approaches" (Savin-Baden and Major,

2004, p. 93). Savin-Baden and Major proposed that there is a difference because the role of

the teacher should be based on the teacher's definition of IBL. They established in their own

research that "when teachers … designed programmes with [inquiry]-based learning as the

central curriculum strategy the effect on roles is likely to be greater than where the [inquiry]-

based learning has been adopted within one module" (p.93).

A slightly different model of the teacher is presented by Mills and Donnelly (2001). Instead of describing the teacher as a facilitator and guide, they wrote about their teachers following an apprenticeship model. The teacher was the mentor and the students the mentees. The teachers were to "devise learning experiences that promote[d] an understanding and appreciation of the role of mentors in learning" (p. xix). At Mills and Donnelly's Center for Inquiry, curriculum was co-created with the students.

Defining the role of the teacher in an IBL classroom has not proved to be as elusive a task as defining IBL itself. Some common characteristics are pointed to in the literature such as the teacher being a guide, facilitator or mentor. A teacher plays a very different role in an IBL classroom as opposed to the role of a teacher in a direct-instruction, lecture style classroom. It seems that an educator's definition of IBL impacts the definition of their own role, but does it impact the definition of the student's role as well? The results of an investigation into what the literature says about the role of the student in an IBL classroom will now be presented.

The Role of the Student in an IBL Classroom

There seemed to be less of an emphasis on the role of the student in the literature reviewed. For example, Newell (2003) devoted an entire chapter of his book to the role of the teacher and what an IBL school should look like. He also provided some real life examples of how the process of IBL affects learners but nothing specific on the student's role. Savin-Baden and Major (2004) however, devoted an entire chapter to the role of the student in a IBL classroom. Powell & Kalina (2009) referred to what students need but not to their role, Glassman & Whaley (2000) described the characteristics and nature of children but again nothing about the role of the students. This seemd consistent throughout the literature

reviewed, with the exception of an article written by Leonard and Penick (2009). Therefore a brief description of the role of the student based on the writings on Savin-Baden, and Major and Leonard, and Penick will be outlined.

Leonard and Penick (2009) presented the following roles a student might typically have in an IBL classroom:

- be an observer

- ask researchable questions

- make predictions and guesses about cause and effect

- plan for ways to test their questions and collect data

- collect, organize and present data collected

- after analyzing data present hypothesis about their results

- share ideas with others in order to receive feedback

- make changes to data analysis based on feedback if necessary

- come to a consensus on their results with others

- work in a group and independently

Savin-Baden and Major (2004) add some different dimensions to what they view as the student's role. They began by saying that a student will need to "actively construct knowledge … [then] compare new knowledge with previous information, they share the responsibility with each other and they work in teams with each other and with [teachers]" (p.82). The assumption could be made that they would align themselves with a social-constructivist paradigm from this description. Here are some further ideas about the student's role. Students should be:

- become problem-solvers and contributors

- be risk takers

- be concerned with the outcomes of the group not just of their own individual outcomes

- become collaborators

- be seekers of important sources of information

These are all fairly high-level abilities for students to possess, which leads to the question, what about students who struggle in the classroom? Does this high-level of responsibility and or capability required exclude struggling students, or can IBL be an inclusive method? Does differentiating instruction make any difference to struggling students?

My hypothesis is that if teachers used an inquiry-based approach in their classroom, they would be innately differentiating instruction. If this is true then IBL should be an inclusive practice even though there are differences in process. Is it possible for a mutual ground to be reached whereby IBL integrates differentiated instruction (DI) principles? In order to answer this question an investigation into the principles and strategies of both inquiry-based learning and differentiated instruction will be presented.

Principles of Inquiry-Based Learning

In an IBL classroom, students construct their own learning by directing the line of inquiry and the methodology to be used. Students engage with a "complex problem or scenario that is sufficiently open-ended to allow for a variety of responses or solutions" (Kahn & O'Rourke, 2005, p.2). New knowledge is built on pre-existing knowledge and real life experiences of the student. Brown, Collins and Duguid conducted research on situated cognition in 1989 and found that learning is indeed maximized if the context for learning is real-life and authentic and the student can see how it relates to the real world. Learning is

minimized when the context it is being taught is dissimilar to the context in which it will be used (Thomas, 2000, p.7).

Tenets of IBL are collaboration, problem-solving, small group discussions and, problems assigned that are of interest to the students in order to maximize motivation while solving the given problem. While collaborating students are analyzing their ideas and theories in partnership with the teacher; they direct the line of inquiry and then take responsibility for presenting their findings (Kahn & O'Rourke, 2005, p.3). Small collaborative groups are a key to IBL; however, collaboration and equal distribution of expertise are not things that naturally occur. Hmelo-Silver (2004) pointed out that a teacher needs to act as the facilitator in order to help students develop this skill (p.247).

Likewise, reflection is a technique that needs to be facilitated. The reflection process is intended to help students relate newly acquired knowledge to previous knowledge; consider how what they learnt may be applied to another situation, as well as to theorize around their new knowledge. Reflection can also be used as an assessment tool for the group. They can reflect on questions such as did we collaborate well, did we direct our learning appropriately, and did we learn anything new? "The reflection process in [I]BL is designed to help students make these inferences" (Hmelo-Silver, 2004, p. 247), answer their own questions and then to ultimately transfer their newly acquired knowledge to different situations.

Definition of Differentiated Instruction

In 1996 the government of Manitoba produced a document called *Success for All Learners: A Handbook on Differentiated Instruction.* This document defined DI as a "means (of) offering students multiple options at each stage of the learning process. It recognizes that

there are many avenues to reach student learning outcomes and that each student needs a complex and unique mix of basic instruction and practice to reach his/her full potential" (1.5).

Principles of Differentiated Instruction (DI)

DI "is not a new phenomenon. The one-room schoolhouses of the past found a way to meet the needs of students working in a wide range of abilities" (Rutledge, 2003, p.1). However, today a teacher faces even greater challenges as students "come from differing cultures and have different learning styles. They arrive at school with differing levels of emotional and social maturity. Their interests differ greatly both in topic and intensity. At any given time, they reflect differing levels of academic readiness…" (Tomlinson, 1995, p.1).

When Tomlinson began writing about DI she discovered it was not being used widely in North American classrooms. Instead teachers were treating their students as a homogenous group who could achieve the same goals at the same time. When Tomlinson asked teachers why they were not considering the needs of each student, they told her they could not find time to differentiate instruction because they were too busy (Tomlinson, 1999, p. vi). Teachers also expressed difficulty in being an "effective catalyst for maximizing talent in (their) students" (Tomlinson, 1999, p. 1). Tomlinson's response was to offer her basic principles of DI because she considered DI a proactive method of teaching (Tomlinson, 2001). Tomlinson also considered DI as a "framework for addressing learner variance as a critical component of instructional planning" (2006, p. 2).

The following principles of DI were taken from Tomlinson's second edition (2001) of *How to Differentiate Instruction in Mixed-Ability Classrooms* and Smith and Thorne's book Differentiating *Instruction with Technology for K-5 Classrooms.*

1) First and foremost a teacher needed to "assume that different learners have differing needs" (Tomlinson, 2001, p.3).

2) The teacher needed to plan lessons that have a big enough range to challenge all students in authentic ways. This may include multiple approaches to content, process and product in order to address what and how students learn and how they demonstrate what they have learnt. When the teacher recognizes that a lesson is not working for all then he or she needs to try and adjust outcomes as the lesson ensues. A qualitative approach should be used in planning because adjusting the workload or the quantity of an assignment will not be as effective as "adjusting the nature of the assignment to match the students needs" (Tomlinson, 2001, p. 4).

3) A blend of whole-class, group and individual instruction typically is incorporated.

4) The learning process is organic as it is never ending but it is always rooted in ongoing assessment. "DI depends on pre-, ongoing, and post-assessment that utilizes both traditional and non-traditional evaluation methods such as teacher observation, self-assessment, and project work" (Smith and Throne, 2007, p.6).

5) Above all, a teacher using DI needed to adopt a student-centered approach keeping in mind that students learn best when they are engaged in something that is relevant and interesting to them (Tomlinson, 2001, p. 3).

Within this student-centred approach there is emphasis on student accountability for their learning and high levels of participation (Smith and Throne, 2007, p.6). Overall, DI is guided by a constructivist paradigm which indicates that all knowledge is built on previous knowledge and that knowledge is constructed in an active rather than passive way (Smith and Throne, 2007, p.7).

Differentiated Instruction Strategies

Peterson and Hittie (2003), suggest four building blocks or strategies that could be used to differentiate instruction. The first building block is *multilevel teaching*. This requires a teacher to provide an environment where students of all abilities can "learn together, each at his or her own level of ability" or a little beyond their level of ability (Peterson and Hittie, 2003. p. 162). Lev Vygotsky's zone of proximal development may be helpful to keep in mind when planning for a multilevel or mixed-ability classroom. Vygostsky's zone of proximal development theory posits that working a little beyond one's present level of ability can be achieved with help and guidance from others. "We seek to take students where they are, provide support and assistances for tasks they cannot accomplish on their own, and challenge them to the next level. Thus, multilevel teaching does not mean that some have it 'easy' and others must work 'harder'" (Peterson and Hittie, 2003, p. 163), all students are working in their zone of proximal development and moving forward.

One example of multi-level or mixed-ability groups is heterogeneous literature circle groups. "Literature circles are small, collaborative, reading groups in which students assume shared responsibility for their learning, which is guided by the teacher" (Anderson and Corbett, 2008, p. 26). Anderson and Corbett (2008) wrote about the effectiveness of including students with disabilities in literature circles and stated that they are "ideal for increasing oral language, reading and writing achievement in a supportive, collaborative learning environment" (p. 25). They identify four guidelines to running effective, heterogeneous circle groups. First of all the students are given a choice in the reading material and are then grouped according to the book they selected. Secondly, the groups meet on a regular basis together and with the teacher who acts as a facilitator or guide to the group as they work through the book.

Lastly, all activities related to the book need to be grounded in curricular outcomes and assessed in an authentic manner. This kind of heterogeneous grouping could be used in multiple ways across multiple curricular themes. Students could play math games of their own choosing, work on a social studies project based on interest and the whole class could participate in a social justice project like packing food at a local food bank together. Tobin and McInnes (2008) agreed with Anderson and Corbett's (2008) suggestion of using "flexible small groups [that] focus on student interest as a means of maximising acceleration of reading…" (p.4) by flexible they meant mixed-ability groups.

In order to move forward, some students will need supports and assistance to reach goals and outcomes. This support has already been defined as *scaffolding*, and it is the second building block suggested by Peterson and Hittie (2003). Scaffolding can involve pre-teaching so students are familiar with skills and concepts prior to an assignment or activity. For example, prior to a novel study a video can be provided so a student has prior knowledge to build on when they begin reading the novel. Any new vocabulary that a student will encounter can be pre-taught. Scaffolding can also take place throughout the process of building new concepts and understandings (Peterson and Hittie, 2003, p. 171).

Scaffolding is not limited to younger students or those with learning disabilities; it is a strategy that can be used for all students. Some examples of scaffolding are: (a) a teacher or a peer can read aloud to students or scribe as they verbalize their ideas, (b) books can be provided on audio or video, (c) computer-assisted technology can be utilized, (d) a variety of materials can be made available at different levels within the same topic, and (e) pictorial guides may be employed to aid students through student led portfolio nights (Peterson and Hittie, 2003).

The third building block outlined by Peterson and Hittie (2003) is Howard Gardner's *multiple intelligences* (Peterson and Hittie, p.173) Gardner outlined eight different intelligences (Appendix A) that everyone has, though all eight are developed to varying degrees. He proposed that students need environments that provide opportunities for all intelligences to develop because all eight work together. There is no right or wrong way to express any particular intelligence so the possibilities for expression in the classroom are endless (Peterson and Hittie, 2003, p.177). Gardner wrote that a teacher could learn a lot about a student's preferred expression of intelligence by observing misbehaviour. "Often such 'behavioural problems' are expressions of the student's need to use a particular channel of learning, or intelligence that is being stifled. These behavioural clues can help us identify strengths while giving us strong signals that we need to allow more intelligence into our classroom" (Peterson and Hittie, 2003, p.177). These clues could be demonstrated by gifted students who are bored; students with disabilities who feel overwhelmed or by the average student who prefers to paint instead of write a paper to express him or herself.

Peterson and Hittie (2003) suggest the use of a matrix in planning a unit that considered all eight of the intelligences, helping the teacher determine the goals and objectives for a unit using the same lesson for the whole class. Numerous learning activities are identified by making check marks across the matrix under each of the multiple intelligences the activity would incorporate. The teacher would ensure an opportunity for expression in all eight of the intelligences for all students.

Some examples of differentiating instruction under this building block have been presented in a document developed by the Government of Manitoba called *Success for All*

Learner (1998). Word cycles, Know-Want to know-Learned (KWL) charts, listen-draw-share, think-pair-share and compare and contrast charts.

  Learning styles are the fourth building block suggested by Peterson and Hittie (2003). A student's learning style is simply the way he or she feels the most comfortable learning. For example, it is how a student takes information in and in what context, how he or she processes information and then responds to the new knowledge. Understanding a student's unique learning style allows a teacher to build on the student's strengths. It also allows a teacher to challenge a student beyond their zone of proximal development continuously moving the learning process forward (Peterson and Hittie, 2003, p.180). The concepts described as learning styles may seem to be the same as those of multiple intelligences. However they are different. Learning styles have to do with how a learner is most comfortable to learn and how they are most receptive to learning. For example does the learner like to listen to quiet music in the classroom or do they prefer silence? Does the environment need to be warm or cool, do the lights need to be bright or dim? Does the learner need lots of direct instruction or just general guidelines? Does the learner need visual cues or written instructions? Does chewing gum help the learner concentrate? (Peterson and Hittie, 2003). Multiple intelligences (MI) refer to "ways in which people are smart and demonstrate ability and competence" (Peterson and Hittie, 2003, p. 182). There may be a crossover between MI and learning styles but their fundamental concepts are different. For example: a child who finds strength using their musical intelligence may also like to listen to quiet music as they work, or, another student who learns using their naturalistic intelligence my learn best in a space that has lots of natural lighting. Some examples of differentiating for this building block are reader's theatre, a dramatic presentation, writing a song, painting, writing, or building. Class environment has a

big impact on students learning styles so the teacher needs to create as close to an optimal

environment as possible. This can be done by: arranging the classroom so there is space to

move, providing tables at different heights so students can stand, offering different seating

arrangements so children can sit on a chair or even on the floor, ensuring less clutter on the

walls, minimizing noise by putting tennis balls on the bottom of chair legs, if possible having

natural light in the classroom, providing areas for students to work alone, with a partner or in a

small group.

Tomlinson believed that in order to successfully implement the strategies mentioned

above some teachers needed to take a giant step and make a complete paradigm shift in their

thinking and practice (Tomlinson, 1995). Would this paradigm shift be such a giant step if a

teacher was successfully using IBL in their classroom? In order to answer this question a

comparison of the principles of DI and IBL needs to be compared and evaluated. This

comparison will be presented in table two.

Table 2

Comparison of Principles of Differentiated Instruction and Inquiry-Based Learning.

Principles of Differentiated Instruction	Principles of Inquiry-Based Learning
▪ Grounded in the constructivist paradigm	▪ Grounded in the constructivist paradigm
▪ Knowledge is constructed on previous learning	▪ Knowledge is constructed on previous learning and life experience
	▪ All knowledge is personal
▪ Learning is active not passive	▪ Learning is active not passive
▪ Authentic learning using real-world situations	▪ Authentic learning using real-world situations and problems
▪ More qualitative than quantitative – the focus is on the process	▪ More qualitative than quantitative – the focus is on the process
▪ Multiple approaches to content, process and product	
▪ Provides flexibility	▪ Provides flexibility
▪ Student centered focused on students needs, abilities and interests	▪ Student centered focused on students needs, abilities and interests
▪ Student accountability for learning	▪ Student accountability for learning
	▪ Student directed
▪ Pre-, ongoing and post assessment	▪ Pre-, ongoing and post assessment
	▪ Curriculum is based on the aims and goals identified by student
▪ Learning is organic	
	▪ Learning is dynamic and fluid

DI and IBL are both deeply rooted in a constructivist paradigm which affects the definition of the principles, strategies and the teacher's role. Both acknowledge that knowledge is constructed from previous knowledge and that knowledge is gained through active learning. Active learning should be based on real-life, authentic situations and problems in order to make it relevant to students. Both DI and IBL focus on the process rather than the product or in other words consider the quality of what has been learned rather than the quantity. The process is student-centered which impacts the role of the teacher (table 2). DI and IBL are based on a constructivist paradigm and focus "on individual students developing deep understandings in the subject of interest" (Yilmaz, 2008, p. 165).

Even though IBL and DI are *based* on the constructivist paradigm, IBL is *grounded* in all constructivist principles and practices. This leads to some differences as revealed in table two. Constructivists believe that all knowledge is based on one's personal life experience and his or her interpretation of that experience. "It views knowledge as temporary, non-objective, internally constructed, developmental, and socially and culturally mediated" (Yilmaz, 20008, p.162). Following a constructivist paradigm IBL also allows for students to give direction in their learning which leads to curriculum being established on the student's identified aims and goals.

Table 3

Comparison of Strategies of Differentiated Instruction and Inquiry-Based Learning.

Strategies of DI	Strategies of IBL
▪ Multilevel teaching	
▪ Scaffolding with high expectations	▪ Scaffolding with high expectations
▪ Multiple intelligences	▪ Multiple intelligences
▪ Learning styles	
▪ Flexible grouping	▪ Small collaborative groups
▪ A blend of whole class, group and individual instruction	
▪ Zone of proximal development	
	▪ Zone of proximal development
	▪ Use dynamic aims
	▪ Students seek evidence to support theories/ideas

There are many strategies that can be implemented by a teacher who is using DI and IBL. Some examples of strategies are listed in table three above. One of the strategies of DI is to blend whole class, group and individual instruction. The literature does not agree on how much direct instruction should take place if any in an IBL classroom. All pre-teaching is a method of scaffolding and adhered to in IBL. Scaffolding is direct teaching and can take place

one-on-one, in a small group or even with the whole class so a blend of instruction is valid in

an IBL approach. Therefore a blended approach is used in both the DI and IBL classroom.

There are no major differences in the strategies of DI and IBL since both are

processes. At this stage the delivery of curriculum using an IBL approach definitely

encompasses differentiating instruction. How do the roles of the teacher compare between IBL

and DI?

Role of the Teacher in Differentiated Instruction

"The teacher is the inevitable leader in any effective classroom. Leadership can and

should be shared with the learners, but responsibility for the leadership resides with the adult

who is charged by professionalism, tradition and law with that task" (Tomlinson, 1999, p.28).

As the leader the teacher sets the tone and climate in the classroom. "His (or her) approach to

students and instruction determines whether respect, humiliation, delight, drudgery, possibility

or defeat wins the day" (Tomlinson, 1999, p.28). This type of environment where teachers

practice student-centred principles, promotes greater confidence in academic abilities and

results in more highly developed social skills and better grades (Perry and Weinstein, 1998, p.

10).

A DI classroom is student-centred but this does not mean the teacher's role is to

spoon-feed students and give them answers to their questions, rather it is to challenge students

to think critically as they problem solve. In a study done by Boaler, Bransford, Sherwood,

Hasselbring, Kinzer, and Williams in 1998 they found evidence that "learning that occurs in

the context of problem solving is more likely to be retained and applied" (Thomas, 2000, p.

7).

Another role of the teacher in a DI classroom is that of a coach or mentor giving students responsibility for their own learning. This does not mean that the teacher gives up complete control or leadership of the classroom and never assigns tasks for the students to do. The teacher guides students in the right direction thus helping them take responsibility for their learning and gaining independence as learners as he or she shares the teaching with them (Tomlinson, 1999). A comparison of the roles of a teacher as defined by IBL and DI is provided below in Table four.

Table 4 – Comparing Teacher's Role in Differentiated Instruction and Inquiry-Based

Learning.

DI Role of the Teacher	IBL Role of the Teacher
▪ The teacher plans proactively for all needs of all students	
▪ Teacher and student are partners in learning the learning process	▪ Teacher and student are partners, co-learners
▪ Draws on prior knowledge of child and helps them integrate it with new knowledge	▪ Draws on prior knowledge of child and helps them integrate it with new knowledge
▪ Helps students become independent learners	▪ Helps students become independent learners
▪ Offers choices – consider students interests	▪ Offers choices
▪ Develop own expertise	▪ Develop own expertise
▪ Teaches to the whole child	
▪ Strives for joyful learning in a positive environment	▪ Strives for joyful learning in a positive environment
▪ Shares teaching role	▪ Facilitator and mediator in learning
	▪ Role model
	▪ Willing to take risks
	▪ Share their own abilities
	▪ Provide interesting material in order to engage students and keep them motivated
	▪ Document to keep students moving along the right path
	▪ Helps student develop critical thinking skills
	▪ Proposes ill-structured, open-ended questions
	▪ Curriculum is based on the aims and goals identified by student or in partnership with the teacher

Teachers who use DI and IBL have many similar roles, but there are also differences. The overarching role of the teacher in IBL is to be the facilitator and guide. By becoming a facilitator or guide the teacher is "no longer considered the main repository of knowledge" (Hmelo-Silver, 2004, p. 239). Teachers support and assist students in the process of acquiring new knowledge they apply to their life. Knowledge they gained by solving problems based on open-ended questions developed in partnership with the teacher. The teacher uses curriculum established by the aims and goals identified by the student in partnership with the teacher. Teachers may wonder how they are going to cover curriculum if the student is directing his or her own learning. The student is ultimately gaining new knowledge or learning a new skill in the IBL classroom in partnership with their teacher. A teacher who knows his or her curriculum outcomes can integrate them into the student's original inquiry idea by provoking further thinking and questioning. This is the real role of the facilitator to keep learning moving forward and on track. As already mentioned DI is a curriculum process that strives to give all students access to the same materials in different ways. The teacher in a DI classroom draws on the prescribed curriculum which is one area of difference.

The teacher in a DI classroom shares teaching by partnering in the learning process, quite a different role to that of facilitator and guide. Shared teaching involves the students teaching each other, the student being consulted about setting class rules and procedures, and "metacognitive teaching" … for example "teachers explain to students such things as how they plan for class" (Tomlinson, 1999, p.33). By doing so there is a sense of the teacher being a director rather than facilitator and guide. "In a differentiated classroom there should be a balance between student-selected and teacher assigned tasks and working arrangements. This

balance will vary somewhat for each student, based on the student's maturity, the nature of the task, classroom conditions and so on" (Tomlinson, 1995, p.21).

No evidence was found in the literature reviewed that others have considered IBL an innate way to differentiate instruction which presented a gap in the literature reviewed. This presented a good opportunity to conduct research and add something new to the existing literature.

The literature review will now continue with an examination of what the literature presented about one key word in IBL – learning. What exactly is learning, and is it achievable by all? This will be followed by a presentation of the discussion of IBL and inclusion.

Is Inquiry-Based Learning an Inclusive Practice?

One word in IBL is learning so, it is important to consider whether all students can learn. What exactly is learning? The Webster's Dictionary (1999) defined learning as, "knowledge acquired by systematic study in any field of scholarly application, the act or process of acquiring knowledge or skill, a process of making meaning of information" (p. 488). Michael Wehmeyer believed that according to this definition all students, even those with severe disabilities, can learn.

Many students with severe disabilities will not be able to learn all the skills and knowledge needed to solve difficult problems. However, this is equally true for most areas in which students with severe disabilities receive instruction, a situation that has been dealt with by the principle of partial participation (Baumgart et al., 1982). This principle states that even if a student cannot do all the steps in a task or activity, he or she can likely learn at least one step and maximize his or her participation (Wehmeyer, 2003, p. 2), thus leading to self-determination.

As with other skills, self-determination needs to be taught. "There is growing acknowledgement that instruction to promote self-determination needs to begin early in life if students with disabilities are to leave school as self-determined young people" (Palmer and Wehmeyer, 2003, p. 115). "A critical element missing, however, in many efforts to 'teach' self-determination is teaching students to take greater control over their own learning" (Wehmeyer, Palmer, Agran, Mithaug, and Martin, 2000, p. 440). Wehmeyer felt that the most common and frequently used approach to special education focused on more traditional strategies and were more teacher-directed. "While these models provide direction for strategy and curriculum development activities that can teach components of self-determination, none adequately provides teachers direction to truly enable young people to become causal agents in their lives" (Wehmeyer et al, 2000, p. 440).

Wehmeyer developed the Self-Determined Learning Model of Instruction "based on the component elements of self-determination, the process of self-regulated problem-solving, and research on student-centered learning" (Wehmeyer et al, p. 440). Wehmeyer says, "It is appropriate for students with and without disabilities across a wide range of content areas and enables teachers to engage students in their educational programs by increasing their opportunities to self-direct learning" (Palmer and Wehmeyer, 2003, p. 116).

Palmer and Wehmeyer (2003) conducted research using the model of self-determination in elementary classrooms. Fourteen teachers in Kindergarten to Grade 3 were nominated by their administrators to be part of the study. There were fifty students, thirty-two boys and eighteen girls ages five to nine either receiving special education services or were waiting for assessments. The teachers and students were from eleven different elementary schools. Data was collected over two school years, 1998-1999 and 1999-2000. The mean

student-rated score on the goal attainment scale GAS was 54.30 ranging from 40-70 which means that the number of goals the students felt they had achieved was on average about what they thought or slightly above. All four grades had an average GAS score of over 50 which indicates this model is effective for students of all ages. The pre and post test results improved significantly.

The "findings from the GAS process indicates that students as young as five can set goals and work through the model with assistance and support from their teachers" (Palmer and Wehmeyer, 2003, p. 124). Both Palmer and Wehmeyer suggest further research using the model with young children since they had a small group of students to work with. They also suggested that the model could be used as a tool to help students be part of the goal setting process in their Individual Education Plan's (Palmer and Wehmeyer, 2003, p. 125).

Guven and Duman (2007) conducted research in Turkey, to determine the effectiveness of IBL for students with mild disabilities. The children selected to participate in the study were, four girls, and, three boys attending a special class in their elementary school. The children were aged six or seven and had been identified at the school as having "mild mental disabilities". All the children participated in a pre-test and a topic was selected based on the children's interests. The topic was a patisserie or restaurant. The study was conducted in three phases. During phase one the teachers and students shared their own personal stories and painted pictures about eating in a patisserie. In phase two the teacher read them a book about a patisserie and they visited an actual patisserie and brought things back from the restaurant like napkins, the receipt and paper bags. In the final phase the students were asked to make a concept map about their week long project with the teacher's assistance. Then the post-tests were administered the following Monday. The results of these tests showed a

significant increase (p<.05) in the students' knowledge about the patisserie. This data, granted from a small study, "indicates that project-based learning was effective for children with mild mental disabilities at all stages" (Guven and Duman, 2007, p.80).

Scruggs and Mastropieri (2007) also conducted research on how "mildly retarded" or "learning disabled" students construct knowledge. Both Scruggs and Mastropieri (2007) were advocates for direct instruction and applied behaviour approaches to special education. Due to the number of teachers they talked to who were using an inquiry-based approach especially in the area of science, they decided to investigate the IBL approach further. They chose four self-contained or segregated middle school classrooms of students with learning disabilities. They compared an IBL approach to using a textbook to learn about electricity, rocks and minerals. What they discovered was that "after two weeks of instruction, test scores revealed that students learned more by participating in activities than by reading textbooks and completing worksheets, providing empirical validation for what seemed to us to be likely to occur" (p. 251). Scruggs and Mastropieri (2007) concluded that "empirical research … indicated that, in at least some circumstances, students with mild disabilities may learn better if they are encouraged to think for themselves about the content learned and draw some of their conclusions based on their prior knowledge and reasoning skills" (p. 256). They suggested further research in the area of students constructing their own learning.

Technology has become a great addition to differentiating instruction and allowing students with disabilities to participate more fully in an IBL classroom. Elder-Hinshaw, Manset-Williamson, Nelson and Dunn (2006) suggest the use of "multimedia inquiry projects by reading assistive technology" as one way using technology to differentiate instruction. This

can be done by using Microsoft PowerPoint, Movie Maker and Kurzweil assistive reading software.

Other technologies that could be incorporated into the classroom to promote inclusion are: an audio version of novels or books being studied which can be downloaded onto MP3 players, e-learning scaffolding tools like "Challenge FRAP" (form for the recording of the analysis of problems) suggested by Stewart, MacIntyre, Galea, and Steel (2007), WebQuests created by Bernie Dodge in 1995 (MacGregor and Lou, 2005, Ikpeze and Boyd, 2007, Abbitt and Ophus, 2008, Sox and Rebinstein-Avila, 2009, Vidoni and Maddox, 2002, Skylar, Higgins and Boon, 2007, Schweizer and Kossow, 2007), text-to-speech software, web-based activities, (Gardner, Wissick, Schweeder and Canter, 2003), and finally problem-based learning software (Cote, 2007). IBL provides ongoing opportunities for students with special needs to be educated in the regular classroom especially with support from the teacher through DI and the provision of appropriate assistive technology.

The evidence suggested in the above research points towards IBL as an inclusive model. All students are capable of learning and problem-solving with the utilization of differentiated instruction.

Regarding students with special needs, especially those with cognitive disabilities, according to Scruggs and Mastropieri (2007) struggled with "attention, semantic memory, logical reasoning, and outer directedness" when doing inquiry or discovery science activities. Scruggs and Mastropieri (2007) conducted a two year study on students in special needs classes and found that this group of students had preconceived notions of science that were well below their grade level. The students were not able to draw correct conclusions from experiments unless it was provided by the instructor and they were "less able to transfer

knowledge to related domains" (p.65). However these students were more successful when peer tutors were introduced. The study did show that the students enjoyed the discovery, hand-on activities. This is exactly why students with special needs should not be excluded from the "regular" classroom. All students benefit from being part of an inquiry-based classroom and can learn from each other alongside the teacher.

Apps and Carter (2006) pointed towards evidence that constructivist approaches are not appropriate for students with cognitive delays. They point out that students with special needs need "explicit instruction to gain skills and strategies … as a pre-requisite to higher-order thinking" (p.23). Apps and Carter (2006) conducted their own literature review looking at discovery learning and constructivism from the ERIC database for the years 1982 – 1999. Basically they came to the same conclusion; there is not much research on IBL and inclusion. Other authors, such as Richard Meyer, state "there is sufficient research evidence to make any reasonable person sceptical about the benefits of [IBL] – practiced under the guise of cognitive or social constructivism – as a preferred instructional method" (p.14) for anyone.

Further examination of inquiry-based learning may add new information to the existing literature on the topic. Chapter three will explain how the researcher conducted her research in an urban, elementary, classroom where the teacher identified herself as a social-constructivist who used an inquiry-based approach in her inclusive classroom.

Chapter Three

Methodology

Upon consideration of the questions proposed, I elected to employ a qualitative, phenomenological research design. A qualitative research method was chosen because I believed that my study met the criteria of qualitative research as defined by Denzin & Lincoln (2005):

> Qualitative research is a situated activity that locates the observer in the world. It consists of a set of interpretative, material practices that make the world visible. These practices transform the world. They turn the world into a series of representations, including field notes, interviews, conversations, photographs, recordings, and memos to self. At this level qualitative research involves an interpretive, naturalistic approach to the world. This means that qualitative researchers study things in their natural settings, attempting to make sense of, or interpret phenomena in terms if the meaning people bring to them (p.3).

I conducted my research in a classroom, which was a natural setting. I sought meaning from the people found in the natural setting. I attempted to interpret the phenomena of inquiry-based learning though the people who had personal experiences with, and an understanding of, the phenomenon.

In a qualitative research project "data are gathered first and then synthesized inductively to generate generalizations, models or frameworks. Conclusions are developed from 'the ground up' or 'bottom up' from the detailed particulars rather than from the 'top down'" (McMillan, 2008, p. 274). This is called grounded theory and typically involves the

use of interviews with people who have had experience with the particular phenomenon being researched (McMillan, 2008).

I followed a grounded theory approach for my research as I conducted interviews with the classroom teacher, learning support teacher, parent of a child with special needs, and the principal of the school. All names were changed and replaced with pseudonyms, to protect the privacy of the people who agreed to be part of the study.

The goal for the qualitative researcher is to "understand participants from their point of view" which could result in multiple 'realities' as each participant expresses his or her own experience. The context of the experiences "is critical to providing an understanding of the phenomenon being investigated" (McMillan, 2008, p. 271).

Qualitative researchers are looking for thick, rich, descriptions of the phenomenon through personal observation of, and interviews with, the people experiencing the phenomenon being investigated (McMillan, 2008). Therefore this study relied on interviews and observations gathered over a two month period from October 13, 2010 to November 23, 2010. The researcher interviewed: (a) the school principal on November 18, (b) the classroom teacher on October 13 and November 23, (c) the learning support teacher on November 23 and, (d) the parent of the child with indentified special needs on November 18. The first interview with the teacher was fifty minutes long; the second interview was 55 minutes long. The interview with the parent was thirty minutes long and the interview with the learning support teacher was forty-five minutes long.

The researcher observed in the classroom twelve times, for a minimum of ninety minutes and a maximum of one hundred and twenty minutes per session. Following each

observation the researcher had a follow up discussion with the teacher either in person or via e-mail.

It is important to note that the researcher spent time in the classroom during the first term. This term is typically when classroom routines are being established and a teacher is still getting to know her students. Results may have been different if the research had been conducted at a later point in the year because classroom routines would be more familiar to the children and the teacher would know her students better.

A key tenet of qualitative research is its emergent nature. The design of any qualitative research needs to remain open ended and flexible as it can continue to evolve as the study proceeds (McMillan, (2008). I kept a set of reflective notes that were separate from my field notes so that I could take note of emerging themes and ideas.

Once my study design was chosen I wrote my proposal and applied for ethics approval from the Educational Nursing Research Ethics Board (ENREB) committee in August 2010. Upon approval from ENREB, I contacted the Assistant Superintendant in the division I wished to conduct my research in and set up a meeting in order to obtain written consent to proceed with my research. (All of my letters of approval, recruitment, and consent can be found in Appendixes B, C, D and E).

With approval from the Superintendent I contacted the principal of Brown School and requested his help with my recruitment letters. Following a discussion we had about my research he suggested several classrooms that he felt would meet my criteria. I expressed my desire to work in Mary's class because I had visited briefly in her classroom the year before and knew she used an inquiry-based approach in her classroom, so he contacted her first. Mary agreed to be part of my study so, we arranged an initial meeting in order for me to

answer questions and address any concerns Mary had, and so that she could sign the informed

consent documents.

Setting

The school I chose to do my research in was built in 1989, in a suburban area of a

large Canadian city. The area surrounding the school had a blend of socio-economic factors

evidenced by the variety of housing in the area. There were co-op housing units, apartments,

semi-detached homes and fully detached homes. There is a new development being built north

of the school that has homes ranging in price from three to four hundred thousand dollars. The

community is ethnically diverse, supporting between fifteen and twenty distinct language

groups and many newcomers to Canada. As a result the school is very multicultural which the

principal reported as a "real strength" of the school. There are currently thirty full time

equivalent teaching staff and nineteen support staff in the building. The school offers a dual

English and French track. There are twelve English only classes and nine French immersion

classes with a total of 464 students. An inquiry-based approach is used in fifteen classrooms.

The current principal, who provided the above information, is the first male principal this

school has had. He believes that the school has a positive image in the community and stated

that they strive to meet the needs of the diverse community they are in.

Mary's classroom was a multi-age grade 1 and 2 space with twenty-three students in it.

There were eleven boys and twelve girls, and eight students in grade 1 with the remainder

being in grade 2. There are thirteen students who speak English as an additional language and

one child who is funded due to a global developmental delay. No paraprofessional is assigned

to the classroom; however the teacher received support from the early learning support teacher

on a rotating schedule and from a Kindergarten teacher identified as a supply teacher in the

afternoons. The Kindergarten teacher supported the writing and reading workshop time in the afternoons but, her schedule was inconsistent due to other spaces she was required to be in. While I was in the classroom, the learning support teacher's time was limited in Mary's room. Mary described the learning support model as "fluid" because each classrooms needs were assessed on an ongoing basis and support time was adjusted as required.

Every day Mary's class started with exploration time for ninety minutes then after morning recess they typically had math workshop, then after lunch it was usually writing and reading workshop.

Classroom Teachers Background

Mary has been an educator for twenty seven years and has used an inquiry-based approach for all twenty seven of them. She worked in two urban school divisions and has always taught early years. She has a degree in Child Development as well as a Bachelor of Education. She credits her first degree in child development with helping her see, in her words, "children first" and curriculum second. For many years her program was considered an alternative because she used an inquiry-based approach and because it was a multi-age classroom. In one school Mary taught, parents had to request their children be placed in her classroom because it had the designation of being an alternative program. In Mary's current school she reported that her classroom is not seen as an alternative program because there are many other teachers using an inquiry approach in the building.

Data Collection

When conducting phenomenological research it is important for the researcher to bracket his or her own perceptions of reality regarding the phenomenon. This is important so that as the data is being collected and subsequently analyzed the true voices of the participants

are heard. Bracketing or setting aside of personal bias and prejudice from the onset is one of the validation strategies outlined by Creswell (2007).

As previously mentioned, I am learning support teacher completing a Master's in Inclusive Special Education and my current area of interest is inquiry-based learning. I have spent many hours reading about, discussing, visiting classrooms using IBL, and making presentations on an inquiry approach. All of which sparked my initial interest in this project. I wanted to hear the voices of the participants and their perspectives, so knew it was important to set aside my existing bias in order to begin this study (Bogdan and Biklen, 2007, p. 25).

I collected data through observations, interviews, and emails back and forth with Mary. During my observation times I recorded what I saw the children doing, what they and Mary were saying and changes I noted in the environment. All these observations were recorded in my field notes which I wrote by hand and subsequently entered on my computer at home. After each observation I made entries in my reflective journal where I wrote down things I was wondering about, my feelings about what I saw and about the classroom as a whole, and things I wanted to make sure and look for during my next observation. Mary graciously allowed me to email her questions and wonderings on a weekly basis. She responded each week with a thorough response which added immensely to my understanding of what she was doing, and why, in her classroom. Observations were at least ninety minutes long but, most were one hundred and twenty minutes. I conducted my observations at various times during the day and on various days of the week.

Validation and Reliability Strategies

Qualitative researchers need some measure of quality to apply to their work. One form of measure often used is validity. Validity means the "extent to which inferences are appropriate and meaningful" (McMillan, 2008, p. 144). Qualitative researchers use validation strategies in "an attempt to assess the accuracy of their findings" (Creswell, 2007, p. 207). According to Creswell and Miller (2000), "prolonged engagement and persistent observation in the field" (p. 207) is one strategy used as a validation strategy. I conducted five interviews, four which I recorded on a digital recorder. In order to increase the degree of reliability all audio-taped interviews were subsequently transcribed. I recorded the pre and post interview with the classroom teacher, an interview with a parent and an interview with the learning support teacher. I made notes when I interviewed the principal to gain knowledge of the school's history. By interviewing multiple adults, and undertaking twelve observations over an eight week period, I have met the requirement for prolonged engagement and persistent observation, as defined by Creswell and Miller.

Another validation strategy is called triangulation. Triangulation means using multiple sources and methods in order to corroborate "evidence from different sources to shed light on a theme or perspective" (Creswell, 2007, p. 208). Since I used data collected from interviews, observations and information from the literature presented, I used triangulated as a validation strategy as well by creating a data triangulation matrix.

In chapter one I identified my personal bias by commenting on my past experiences and orientations that "have likely shaped the interpretation and approach" (Creswell, 2007, p. 208) to my study, again as a method of validation. The final validation strategy that I used was

to provide "rich, thick descriptions" of both the participants and setting in my study (Creswell, 2007, p.208).

Other validation strategies incorporated in this research outlined were: (1) the project was built on existing educational theory, (2) the research questions drove the data gathering and analysis, (3) criteria were established for involving the specific participants, 4) a competent data collection technique was applied, the use of interviews (Eisenhart and Borko, 1993).

Prior to collecting data I thought it would be helpful to create a table outlining which data might help me answer each of my research questions. See table five below.

Table 5.

Research Questions	Data that will help answer question
1. How is inquiry-based learning defined as a philosophy or a teaching method? How does the definition impact implementation? How are teacher and student roles defined and implemented? How does the definition impact the use of curriculum?	• Interview classroom teachers. • Observe in the classrooms and take field notes. • Literature review.
2. Do educators consider IBL an innate way of differentiating instruction? How is this demonstrated?	• Interview classroom teachers. • Observe in the classrooms and take field notes. • Interview the learning support teacher. • Literature review.
3. Is IBL an inclusive practice?	• Interview classroom teachers – specifically around IEP goals for each student. • Interview learning support teacher. • Interview parent/s of child with special needs. • Observations in the classroom and take field notes. • Literature review.

Emergent Themes

Upon completion of a thorough analysis of the data I formed my conclusions based on the themes that emerged from the data which I determined through a series of coding and recoding. Blind coding was the first approach taken with the data. I looked for key words and phrases that were stated over and over again and for repeated behaviours. After each observation or interview I reviewed the information I had gathered that day and made notes of further information I wished to collect in my next interview or observation. Hesse-Biber and Leavy (2006) refer to this as an "iterative process" (p. 348). I utilized an iterative process as well as a grounded theory approach to my data. An "analysis perspective [that] starts from and engagement with the data and ends with a theory generated or grounded in the data" (Hesse-Biber and Leavy, 2006, p. 348).

As the data was transcribed, read and re-read, and coded some clear themes emerged: (1) the big picture, (2) community, (3) technology, and (4) student-centered. Within each of these themes, several sub-themes also emerged as outlined in table 6.

Table 6

The big picture	Community	Technology	Student-centered classroon
- Philosophy and beliefs - Classroom set-up - Daily plan - Curricular connections - Invitations - Role of the teacher - Differentiating Instruction - Assessment practices - Respect	- Acceptance - Interaction - Environment - Respect	- Use of technology - Positive or negative results - Curricular connections	- Students as driving force in the classroom - Experiences - Inquiry - Role of the student

The findings will be presented in Chapter four using the headings of the four major themes,

supported by the sub-headings.

Chapter Four

Findings

The purpose of this study was to investigate the definition and implementation of

inquiry-based learning in an inclusive, elementary classroom. In order to accomplish this, it

seemed appropriate to be immersed in a natural setting where IBL occurred. As explained in

Chapter 3, during an eight week time frame, I conducted and transcribed four interviews, and

spent twelve days observing and writing field notes to gather data. The data has been analyzed

through a lens of social constructivism as defined in Chapter 1. As the data was transcribed,

read and re-read some clear themes emerged: (1) the big picture, (2) community, (3)

technology, and (4) student-centered. Since all the themes are impacted by the big picture, it

will be presented first.

Theme 1- The Big Picture

Mary had what she called a "big picture" view of her classroom and her practice. As I

interviewed Mary and conversed with her over the eight weeks, it became clear that this "big

picture" was founded on Mary's philosophy and beliefs and impacted everything she did.

Mary's "big picture" view impacted: (a) classroom set up, (b) the daily plan, (c) curricular

connections, (d) her role and, (e) the respectful way she conducted herself each day.

Mary believed that inquiry-based learning was primarily a philosophy that

encompassed "everything in the classroom, every minute of the day" and that it was the only

way she could conceive of doing her job. She referred to her beliefs about IBL as a stance that

influenced her interactions with the students on a daily basis. Mary believed that an

environment needed to be created that allowed children to wonder. She wanted children to

construct new knowledge and have new experiences, as well as to make connections with

existing knowledge and experiences. Mary viewed IBL as an inclusive practice because

everything she did in the classroom took into account everyone in the community. Mary assumed that "everyone was wondering about something and everyone could make a connecting point with something." As long as Mary set up the classroom and provided rich, broad, experiences for the children she knew that all children could make connections.

Classroom Set-Up and the Daily Plan

Everything that Mary did was tied to her philosophies and beliefs. Mary tried to create an inclusive environment where everyone felt safe and accepted. If children felt safe she knew they would be able to be "risk takers" in their learning. The classroom community was diverse and it was a challenge for Mary to create a space where everyone felt included. Diversity in the ethnic backgrounds of the children, the academic abilities, life experiences, ability to communicate and the likes and dislikes of the group. Mary's classroom was set up "with lots of basic things for everyone so that all children would be able to interact and play." Basic things like water, sand, construction materials, art supplies, dramatic play, games and puzzles. Mary deliberately set up the environment both physically and within the daily plan to "minimize whole group activity" and she focused on more individual and small group activities which promoted socialization. There were lots of natural things in the classroom: goldfish, stick bugs, nests, pine cones, flowers, plants, shells, twigs, leaves, roots, soil for planting, a cactus, mushrooms and many wicker baskets.

The classroom had a big carpeted area where the morning meeting took place. On either side of the carpet was a big window. This made it a very bright room with lots of natural light so most days the ceiling lights were not on or, only half of them were on. When the children arrived in the morning there was often quiet music playing which the children

would sing to spontaneously as they gathered on the carpet. There was a feeling of calmness in the classroom and everything in it indicated it was a space set up for children.

Mary's day plan also reflected her philosophy and beliefs about children and how they learned. The day plan was the same every day with the exception of gym and music. Each day started with exploration, followed by, snack, recess, math workshop, lunch, gym, music or yoga, reading and writing workshop, recess, and home routine. She described the day as a funnel. "Our day is designed to go from really wide open to more narrow and the children have less and less choice throughout the day. I think children make their best choices when they are well rested."

Mary considered exploration as the prime time of the whole day. She described exploration as "the time where they have the most latitude with their thinking and they are the most independent. Most of our important learning and certainly the starting points for lots of our learning come from explorations." The children had explorations for ninety minutes each morning and had free choice over which areas they explored.

There were, as Mary described, "must do" activities that the children were expected to complete during exploration time. They could choose which day to do them, as long as they were done by the Friday of each week. One of the must do activities was flower of the week. Each week the children learnt about a new flower and a different medium to draw or create the flower with. The children also had to complete the art workshop activity for the week, specified by Mary.

As I observed exploration each morning I wasn't sure what the goal of it was so I asked Mary. Her goals for exploration were varied:

Play, social interaction, social skill development, collaboration and cooperation, choice

making, exploration and discovery, connection to the thinking and or work of the

group or small group, connecting new ideas with previous knowledge, sustaining

personal interests and inquiries, developing plans, personal organization, accessing

materials, learning to clean up after yourself and so many more (written response via

email, from Mary).

Each morning the class met on the carpet for the morning meeting where the day plan

was reviewed. Mary always asked if anyone had anything they wanted to add or change about

the plan. Sometimes students would share ideas that would then be added. For example, one

morning two children brought things to share with the class that were placed in the "take a

look" basket so that was added to the plan. Another morning I was in the classroom and the

students did not see my name on the plan like it usually was, so they asked for me to be added

to the plan.

Mary set the standard for the day with her respectful attitude towards the children and

adults in her space. She spoke in a quiet voice and genuinely seemed interested in each child

as they arrived. Mary waited at the door for them and chatted about their evening or what they

might do that day. Mary was very positive in her interactions with the children. If someone

blurted out an idea Mary would ask the child to keep the idea in his or her head and share it in

a minute. She often solicited their opinions, gave them time to think before they responded,

enlisted children to help others, asked students if they needed help before stepping in and

solving a problem, recalled personal information about the children, encouraged them, and

referred to the day plan as "ours."

One morning when Mary arrived at school, she found the flower of the week destroyed. She showed the students the pot with the flower in it during morning meeting and told them "this broke my heart when I saw this. I bring these into the classroom to make our space interesting. I put the flower in the art area yesterday because I thought students were still enjoying drawing it. This makes me very sad and it has hurt my feelings ..." I thought this was a very respectful way of modelling how to express a feeling of being upset. It was also a good way to illustrate how the actions of one student impacted the whole community.

Curricular Connections and Mary's Role

Mary believed her role was to create a structure that encouraged connecting points with different areas of curricula. Mary had a general plan of what she hoped to accomplish in the different curricular areas, but she remained flexible. She said that she blocked out the daily plan in advance and knew what the flower of the week would be, what the art workshop would encompass, what the focus for writing workshop was going to be, and what concepts needed to be covered in math. All these things could change depending on the children's questions and interests.

In order to know what her student's interests were Mary did lots of what she called "kid watching." Mary had lots of conversations and conferences with the children during exploration time and during reading, writing and math workshops. I often saw Mary with her little notebook sitting with a child asking them to justify a math idea, or explain what they were writing about and or thinking about.

Kid watching helped guide the "invitations" Mary set out for the children. New invitations typically grew out of connections, discoveries, observations, or wonderings from the children. Mary set out invitations that would connect specifically with the interests of an

individual child or a small group. Sometimes she set out invitations based on something she was wondering "if she could get going with the children." Mary believed that part of her role was, to provide opportunities for the children to experience something in a new way, from a different perspective, or as an "open ended stimulus."

Mary's goal for setting out invitations was always to deepen a child's thinking. Mary shared an example of how setting out an invitation could do this, during our second interview:

The children found some leaves on a nature walk we took. They became interested in the veins on the leaves, so they began reading about veins in the books I set out. (the initial invitation) One child asked if [leaf] veins were like the veins on her hands. So we started looking at the leaves and our hands and noticing all kinds of similarities. Some of the students were saying "that's like a person". We had been reading a book about the bark on a tree and how it was like a person's skin because it holds you all in and protects you. They knew trees rest in the winter and said that was "like a person who rests," so; they connected the veins from the leaf to the veins in a person. They were making all of these interesting discoveries and connections. We started talking about leaves and our hands having veins and put the leaves on the light table (second invitation) to look more closely at the veins. This reminded a child who had been in my class the previous year, about the x-rays I had. She asked if they could look at the x-rays on the light table as well. The class had been learning about their heart beat in music where they had been doing some drumming and talking about the beats of a drum and the beats of their heart. So the students wondered if they could see their heart on the x-ray. I got out the x-rays and we spread them over the light table. They noticed the shoulder and the ribs, and they started to build a body with these random x-rays.

They quickly realized the x-rays did not show the veins. Kevin, whose mom is a nurse, said he bet she would know why they couldn't see the veins, and offered to ask her that evening. He came back the next day and told the class it was a Magnetic Resonance Imaging (MRI) machine that took pictures of veins but we didn't have any MRI's to look at. So you can see that those connections grew out of an invitation to deepen the ideas the students had, about the similarities between a tree and a human.

This particular invitation started off with books about leaves, and as the children made connections with their own bodies it ended up as an inquiry about human veins and hearts. Mary could not have anticipated that the nature walk would lead to a discussion about how veins could only be seen on an MRI. The initial invitation was set out as a result of an interest the children had about leaves.

The connections the children made were constructed from prior knowledge and their collective experiences. The students used their "tool kit of concepts and skills" (Davis, Maher, and Noddings, 1990, p.3) to develop their own questions and hypotheses; they discussed their ideas, and then asked an expert for help. Mary set out the invitation, guided the inquiry, and provided materials that helped extend the learning of the students.

Leonard and Pennick (2009) described the role of the teacher as the guide and provider of authentic, real-life activities for the students. The above example illustrated how Mary did exactly that. The real-life activity was a nature walk inspired by observations the children made about falling leaves. Mary listened to what her students were interested in and talking about, which led to a nature walk to collect leaves. Mary then guided the students to the light table. Next she was able to provide the x-rays and extend the children's learning. She created

a "safe, stimulating environment" (Leonard and Pennick, 2009, p.41) by extending invitations to her students.

During my observations of exploration time I saw many activities that started from invitations set out by Mary. Most of the invitations Mary set out were connected to the curriculum. The early year's science curriculum has specific learning outcomes regarding living and growing things.

Mary provided many opportunities for students to learn about, and have experience with, growing and living things. There were several living things in the classroom: fish, stick bugs, flowers, and many, many plants. During the morning meeting Mary always asked someone to feed the fish, an important element to keeping the fish alive. The stick bugs were also a source of ongoing discussion. One morning Mary told the class that many of the stick bugs had died, and that they needed to leave the tank and the bugs alone for a few weeks. Mary explained that insects were impacted by lack of sunlight in the morning so this may have affected the bugs, or there might have been something on the lettuce that had made them ill.

The plants and flowers were part of the daily meeting and morning discussion. The children regularly planted seeds and observed what happened to them. They observed and drew a different flower each week, they had binoculars to look out the window at the trees and flowers, there was an *I think my plant died container* which they could place their flower pot in and then have a discussion about whether the plant was really dead or not, they went on nature hikes to observe plants and trees during different season, they visited the English garden to observe all the beautiful flowers, and they read lots of books about trees and flowers.

One day Mary read a book called *Alison's Zinnia* which was an ABC book featuring a different flower for each letter of the alphabet. After the story was read the students started making all kinds of connections with the flowers they had seen based on their own experiences. "My dad planted those in our garden," "I have pink roses at home," "those look like my yellow flowers," "can you go back to the page that said regina? That sounds like the place my cousin lives," "can you go back to the Z page? Those look like chrysanthemums," "A started with Alison."

Mary explained how she believed the children could learn more about living things from their experiences in the classroom day by day, as opposed to spending time on a unit about living and growing things. By providing these real life experiences, Mary said she was providing an opportunity for the children to learn to explain their experiences as well as make new discoveries.

Mary had an aim in mind, that the children would acquire new knowledge about growing and living things. The aim had order, and progressed as Mary nudged the tentative plan along. There was however flexibility to the plan. This is an example of how Mary followed the model of inquiry expressed by Dewey.

On another occasion Mary read the class *Stellaluna*, a fictional story about bats. She placed four copies of the book and some puppets on the science table for the children to explore. She thought they might enjoy re-telling the story. The children started to get very interested in bats and asked lots of questions about them, so Mary brought books into the classroom from the library and they watched some bat videos on the computer. This grew into a spontaneous inquiry sparked by the children's interest that helped them construct knowledge about living things in a way Mary had not anticipated.

Mary set out an activity or invitation and it was either expanded by the children's interests or not. She believed that the children's learning was fluid and said, "Things didn't have a real defined start and finish. A thing just fades out which does not mean an inquiry has ended. Children will often hold onto things or become more personally invested and keep a little thread going themselves or in a small group." During the time I was in Mary's class she stated the bat inquiry "was in a bit of a lull" but that she could easily "ignite" the interest again by getting a few new books or a video. The students had made clay bats so she knew once they were fired in the kiln and the students needed to think about adding wings to their creations that too would ignite their interest. Mary said what the children learned about bats was not that important to her. What was important was the process of wondering, the questions the children asked, and providing opportunities to explore and find ways to answer questions.

Differentiated Instruction

Mary believed that all children could make connections to the curriculum, but that they all came at an activity in a different way, therefore to expect that "they were all doing the same thing, at the same time, just seems unnatural." In order for all children to make a connection, Mary believed that she needed to provide what she described as "rich and broad enough experiences." Mary said her "goal was to differentiate for everyone" and that she worried if the whole class was doing the same thing at the same time.

I observed many instances of differentiated instruction in Mary's classroom. For example: (1) during Math workshop all students were playing the same Math game but some used a 20 sided die and others used a 30 sided die, (2) during reading workshop Mary read with the children one-on-one and helped them select just right books, (3) there were many

manipulative materials available to help students with their math, (4) children had a choice of what type of paper to use for writer's workshop depending on how much they planned to draw and or write, (5) lots of visual examples were used, (6) Mary provided lots of opportunity to practice new skills and (7) students were always given more time to finish an activity if they needed it and, (8) Mary would model a new game or activity for the children if they needed her too.

Assessment

The final part of Mary's role we discussed was assessment. She reported that she did not use any standardized assessment tools but used a variety of different assessment techniques that allowed her to determine where her students were academically. The report cards used by her school were mostly anecdotal. Mary said she wrote about two pages of an anecdotal for each of her students and plotted where they were on the reading and writing continuum developed by Bonnie Campbell Hill.

Mary gathered the information for the anecdotal report as she documented the students learning. She had a notebook with a page for each student where she documented conversations she had with them and she made notes about their writing, reading, and math abilities. The parent-teacher conferences were student led and focused on the "child joyfully sharing his or her work" with the parent/s.

Mary also did day-to-day assessments of learning taking place during exploration time. If she saw something that required her guidance, she would provide guidance to an individual, small group, or whole group, depending on the need. For example: one week the children were creating mini self-portraits that were going to be used as part of the calendar routine the next month. Mary noticed that the children were very interested in making self-portraits so she

added a few books to the art center during exploration. The children immediately started looking at the books and talking about the different portraits they saw. The next day Mary added some small mirrors so the children could look at themselves as they drew, she also added some different pencils and pastels. As she observed the children drawing she noticed they typically drew their eyes to high on the face so the next morning she led a mini lesson on where the eyes should be situated and what shape they should be. Another day a child was planting seeds in the plant area. He was planting several different types of seeds but had not labelled them. Mary walked by and asked the child, "how are you going to know what you have planted?" The child responded, "I could make a label." Mary said that was a good idea and left him figuring out how to do that.

Documenting was something Mary spent a lot of time on, either during class time or at recess and lunch breaks. She said the type of documenting she did was dependant on its purpose. This is how she described the process: "If it is for a particular inquiry I may document by recording dialogue, wonderings, and observations and I write and take photos. If it is necessary I will bring a small group together for further conversation, reflection, or investigation." Mary saw this as an important part of her role in the classroom and a key to getting to know her students "strengths and struggles and for changes and growth."

This type of ongoing assessment seemed to be a very respectful way for Mary to connect with her students. By doing so she could set out invitations that appealed to the student's interests and further their learning. It also helped create a community within the classroom as Mary became aware of connections that could be made and encouraged between the students.

Theme 2 - Community and Acceptance

   Mary was part of a community with her colleagues and she had a classroom

community. Within her community of colleagues Mary described several examples of

collaboration. When I asked Mary about how often she collaborated with others she

responded, "I feel like I am always in a collaboration of some sort." Mary identified

collaborating with Janet, the learning support teacher, the school librarian, and another

classroom teacher who also used an inquiry-based approach in the school. This school year

Mary and the other classroom teacher had collaborated on the "flower of the week" and they

had planned their yearly field trips together.

   Mary also talked about the collaboration that went into her daily plan. At the beginning

of the year the teacher's met together and identified times of the day they preferred to have

their learning blocks. By collaborating with the gym and music teacher and classroom

teachers, Mary was able to have a consistent daily schedule.

   Janet and Mary both talked about collaboration, and how they collaborated with each

other. To Janet, the strength, or weakness, of collaboration was based on the kind of

relationship she had with a teacher. She said she worked really hard getting to know the

teacher's she supported and tried to "understand what motivated them, and what they wanted

from their kids." Once a good relationship had been established, Janet felt that she could "try

to mitigate [her] beliefs and philosophies" about what she considered to be, "best practices"

for the kids. This dialogue with her colleagues engendered further thinking, and created

disequilibrium which in Janet's mind facilitated learning. Dialogue also gave an opportunity

for both parties to defend, prove, justify and communicate their ideas. These were all

principles of constructivism outlined by Fosnot (1996) that Janet and Mary practiced and modelled.

Janet spent time collaborating with the teacher's in her pod but reported that it looked different with different teachers. She had specific time set aside in her six day cycle for collaboration and over a two to three week period could meet with each teacher for an hour. Janet did meet before and after school and during lunch hours with teachers in more of an "impromptu session, not doing full bore planning, it's mostly day to day planning that takes place."

Janet reported that collaboration was always easiest when the teacher and she had the same philosophy and beliefs about education. She held some similar beliefs and philosophies to Mary and some that were different. Janet was asked how she defined IBL, to which she responded, "that's a hard question because I don't think inquiry ever looks like the same one thing." Janet thought that inquiry could include:

> a small thing that happens during exploration time, where kids are exploring and inquiring and just something will come up that may last one day or many days. I think inquiry is also honouring of a child's interests and the teacher stretching that [interest] or facilitating the [interest] into a large project, or it may be something that all of the students are included in.

She thought that an inquiry-based approach could be inclusive, but was not necessarily so. Whether a classroom was inclusive or not, depended on the teacher's philosophy and implementation practices.

Janet had collaborated with Mary around a social activity for Timmy, the little boy with special needs. In the fall she had created a gardening club that Timmy was involved in.

The gardening club was designed for children like Timmy, who struggled at the end of the day. When I was at the school Janet was also helping Mary's class with a crayon portrait activity that extended the learning about portraits. As per Mary's request she was also going to give Timmy some support during Math workshop during the second term. Mary reported that she was looking forward to having Janet in the classroom during math workshop as she really struggled with meeting Timmy's needs during this time of the day.

Being part of the larger community was important to Mary, but her daily focus was on her classroom community. Within the classroom there was diversity in the ethnic backgrounds of the children, the academic abilities, life experiences, ability to communicate and in the likes and dislikes of the group. Mary believed that these differences became magnified in a classroom setting. Community was so important to Mary that she deliberately and with intention planned a shared experience for the class in September. The class went to the English garden which in Mary's words helped them be "in the same head space." She said she liked to go on a field trip the second or third week of school to have a "lovely bonding time that brings the whole group together."

Mary made a point of getting to know her students as unique learners with strengths and challenges. She recognized that

> … for children, the range in development and experience [is great]. The needs for everyone are different. It doesn't really matter if the differences are because a child is on the autism spectrum, or because they have only been in Canada a week, or if the difference is because they are the oldest or youngest child in their family ... we are all different in many different ways.

Mary believed in inclusion and acceptance and respected each child as an individual who had individual needs. She worked hard at her "big picture" thinking to create an inclusive environment in her classroom. Mary reflected that if children felt safe and accepted they would be more willing to take risks in their wondering and learning. Mary did many things to provide a comfortable, secure environment. She had a predictable schedule; she played quiet music, alternated the lighting, displayed lots of the children's art work and had many options for children to sit or stand at when they worked. As already mentioned she also provided many spaces for small groups to meet and work together. How the group interacted was a big part of the experience Mary concerned herself with as she planned and thought about her students.

I did see some lovely examples of children being kind, respectful and accepting of each other. One morning a little girl started to cry during morning meeting so another child offered to take her to get a drink of water. She was upset about her duties at lunch that day so another child very spontaneously said they would help her with them. Another day there was three children who wanted to play checkers. So they worked out who was going to play with whom. The child who was not playing sat on the side and cheered both players on by chanting "let's go, let's go" and filling in each child's name he was cheering on.

As in most classrooms there were some instances of exclusion that I observed. During exploration there was a small group of girls in the class who behaved in quite an exclusive way. These little girls were often together during exploration time and usually at the art table, which was situated in the back corner of the classroom. The group all spoke a common first language and would speak this language to each other. This was positive for the newest child in the group who spoke less English, because she felt more confident to communicate in her

first language and included. The problem arose when the girls spoke their first language and

excluded others at the art table in their discussion, or when they used their own language to

make fun of others in the room. Mary was keenly aware of this problem and said that it was

actually a school wide issue that needed to be addressed. She had spoken several times to the

girls about not excluding people.

Another example of exclusion involved a little boy with special needs who was

funded. He did not have any specific support during explorations. He was diagnosed with a

global developmental delay and according to Mary, struggled with social interactions, speech

limitations and general immaturity. Consequently during exploration time he did not seem to

get settled at any one activity. He flitted from activity to activity, sometimes as often as every

thirty to sixty seconds. With his delayed speech patterns he was not easily understood by the

other children. Even his twin sister who was in the same room had trouble understanding what

he was saying. One morning he was playing on the carpet beside a group of children playing

with the blocks and animals. He turned around and tried to take one of the blocks. One child

said emphatically to him "Timmy move!" Timmy, "I am going to help you." Child, "I don't

need your help." At this point Timmy just wandered away to the house and played there for a

few seconds. A few minutes later he was at the sand table where three little girls were playing;

as soon as Timmy joined them they all wandered off and left him alone at the table. Mary and

Janet, the learning support teacher, had planned some social skills activities for him in the fall

and would plan some further social and language skills opportunities for him during second

term. Mary identified this as a challenge for her, planning for Timmy and providing the

support he needed. She was aware of how the other children treated him and intervened as

often as she could. Mary and I talked about how Timmy could benefit from support during

exploration time.

As already mentioned Timmy really struggled with engagement during math

workshop. Some of the literature reviewed in Chapter two referenced the use of technology as

a method of differentiating instruction so, I wondered if using the computer during this time of

day could be a possibility. Timmy's foster mom indicated that he had a high level of interest

in the computer and that she noticed he was more engaged when he was doing something he

was interested in.

Theme 3 - Technology

In the province where this research was conducted there is a *Handbook for Literacy*

with Information Curriculum Technology (ICT) across the Curriculum. Literacy with ICT is

defined as, "choosing and using ICT, responsibly and ethically, to support critical and creative

thinking about information and about communication as citizens of the global community.

Literacy with ICT consists of critical and creative thinking, ethics and responsibility, and ICT

literacy" (Overview). The Department of Education developed an ICT continuum for

Kindergarten to Grade 12 referencing applicable curriculum outcomes. The School Division

where the research was conducted, has a Facebook account, a Twitter account and MP3 files

that can be downloaded from their website. The division has made online educational Journals

available to the public and to their staff, as well as online versions of important presentations

made by the Board of Directors. The division also hired an Assistant Superintendent, two

years prior, who oversees Information Technology within the division. This division places an

emphasis on technology use both at the Board office and local school level and offers ongoing

training for a variety of technological equipment.

Mary and Janet worked in a Division that placed a high level of importance on technology and in a Province where the Department of Education seemed to value the use of technology. Therefore, when I asked them about the use of technology in the classroom, I was expecting a positive response.

In Mary's classroom there was only one computer, however there was a computer lab in the school that could be booked. The children sometimes had access to the classroom computer during exploration time, but apart from that it was used by Mary to enter her morning attendance or to print pictures. I first asked Mary of she could have more computers in her classroom. She indicated she probably could have more classroom computers but, "didn't have any space for them." She stated that there were things that needed to be givens in an early year's classroom: blocks, opportunities for dramatic play, sand, water, math materials, art materials, and lots of books.

Mary said she "was not a huge fan of technology for young children" because she believed they needed to "connect with the real world as much as possible before they got into a virtual world." She thought that her students came into the classroom with lots of experience with technology but "very little experience with real things, like board games . ... It is really my goal for us to experience the world in real ways as much as possible." Experiencing the real world by "talking and interacting and thinking together [which] happens in a deeper way around things like the sand box, blocks, etc. more than a screen."

This was an interesting response, because it indicated to me that Mary did not consider technology as part of what she referred to as a child's "real world" in her classroom. Mary believed that if children sat in front of a computer screen the social aspect of learning was inhibited and that interacting and thinking together would not take place. I found the opposite

to be true during my observations. During one observation I saw two little boys using the computer to draw pictures. They were having a great discussion about what they were doing and how to change a colour and a line on their drawing. They were interacting and thinking together about the picture as well as creating a story about the character that they were drawing. I also observed a group of children in the Lit Lab who were working on writing their names in different fonts so they could cut them out and glue them onto the front of a journal. There was a lot of laughter and conversation amongst the group that day. If one child wasn't sure how to change the font or the size of the font another child stepped in and helped out, so they were problem solving. On another occasion, Mary told me they had been watching short videos about bats on the National Geographic website. The children were doing an inquiry on bats and the videos had led to great discussions and added more questions to their inquiry.

I asked Mary how she would include a child in the classroom who needed an augmented communication device. Her response was that they "would just figure it out in ways that it would not become a huge focus because it would be part of the child's reality."

Janet had a similar response to use of the computers as she stated that technology played a very minor role in early year's classrooms:

> I think that for most kids they have tons of access, if we are talking about computers, so I think for younger kids it is really important that we expose them to things they are not going to get. Things like clay, finger-painting, water play, and sand. I do think there are some limited uses of computers for young children and for students with special needs. I don't want to see kids just sitting in front of a computer, and I would not send a group of kids to the computer lab with a paraprofessional because that would seem like a pull out program.

I asked both Mary and Janet specifically about their views on how technology could be used to Differentiate Instruction. Mary was asked about Timmy. He was working on basic number sense which most of the other students had moved beyond. Mary struggled to find activities for him to do during math workshop which would be beneficial to his learning, and activities that would allow Timmy to interact with his peers. Mary's response to him working on the computer was: "computer is never my first choice. I would prefer to have an adult or another child work with him, for him to interact with. He does seem very interested in the computer, but I am not sure how independent he would be."

Janet said that she thought there were some limited uses of technology for students with special needs. She referred to a child who was non-verbal who used an "iChat", to help him communicate. "I wish there were more tool like that, not tools for just sitting in front of a computer." Neither teacher had a very positive attitude to using computers or technology to differentiate instruction.

Mary's response to the use of technology was in line with her philosophy and beliefs if she truly believed that using a computer would not lend itself to social interaction. I wondered though, how use of technology fit into her beliefs around the classroom being student centered, or student-driven. She described a student – centered, student driven approach similar to that of Bell (2010), who believed that student choice was a key element to IBL. It seemed as if choosing the computer was not really a student choice in Mary's classroom.

Theme 4 – Student Centered Classroom

Mary clearly defined her philosophy and beliefs. She stated that "learning [was] a social construction" which meant that "children learned in social ways, needed to actively engage, move about, and have opportunities to manipulate [their world]." She believed that children were the "driving force, or the fuel to the fire of the life of the classroom." Mary said

that in her heart she always felt the child should be first and curriculum second. All of her

professional readings over the years coupled with her experiences confirmed this in her mind.

I observed many other occasions where the students in Mary's class made choices as

well as occasions where students drove the learning process. Below is a compilation of

examples of choices the students made while I observed in the classroom:

- students chose which activities to do during exploration

- they could choose the same activities every day if they wanted to

- the bat inquiry was initiated and driven by the students

- squirrel discussions were initiated by a student who brought in a peanut to show the class, and subsequently driven by the class

- during writer's workshop the students are allowed to choose their own topic to write or draw about

- children could choose whether to write, draw, or both during writer's workshop

- students chose which math aides they wanted to use, a hundred chart, beads, counters etc.

- students chose which books to read during reading workshop

- children got to say if they wanted the class to sing Happy Birthday to them or not

- Mary asked children if they wanted to help her she didn't just tell them

- students could choose to add something to the day plan if they wanted

- one day the students got to choose between yoga and a walk outside since it was such a beautiful day

- the children had a choice about when they completed what Mary called their "must do" jobs

- during art workshop the students always got to choose from a variety of medium and
  colours

- children chose to be part of a small group or to play on their own

- the children had many opportunities to share what they noticed or discovered if they chose
  to

- student/teacher conferences were student led and focused on celebrating the learning of
  the child, the child chose what to put in his or her portfolio

- children chose to be engaged or not in an activity

- students were encouraged to be wondering and questioning every part of their learning

- children chose who they played with during exploration

- children could choose where to sit at lunch time

Clearly the students had lots of opportunity to make choices throughout the day, but

this happened more predominantly during exploration time. This was Mary's intention, as

already outlined earlier in the chapter.

Parent Perspective

      I wondered what parents thought about all the choices the students made during the

day and how they viewed inquiry-based learning. I interviewed Timmy's foster mother to

determine if she understood and or could describe Mary's philosophical approach to the

classroom. Ivy was not able to identify that Timmy and his sister were in an inquiry-based

learning classroom. She could see that Timmy had gained confidence since he had moved in

with her in 2008. She said that education was very important to her and that she wanted them

to learn how to read and spell and count, as well as learn what was right and wrong. Ivy knew

that Timmy struggled in school but said that when he as interested in something he was more

motivated. She said he loved books and cars. Ivy said that Timmy and his sister both liked exploration time partially due to the choices they could make.

Mary indicated this was a typical response from a parent, as most parents would not be able to express an understanding of inquiry. Mary said that she and Janet have spent time trying to help the families understand inquiry by "uncovering what we do in the classroom and how and why we do the things we do." They have done this during the student-led conferences and in the weekly note that is sent home on Friday's. Mary said that inquiry is a fairly new approach at her school and that it will take time for everyone to understand what it means. New knowledge is constructed from previous knowledge and experience, which for many of the parents according to Mary, is more traditional. As the teacher's "shake up" those ideas they continued to look for ways to include parents in an ongoing dialogue.

Mary is a teacher who clearly knew what her philosophical stance was and how to implement it on a daily basis. As an experienced teacher she knew the importance of thinking about and planning for, her students. Mary's concern for the children's learning was reflected in the way the children responded to her. She cared deeply about the connections the children made to the world around them and the experiences they had in her classroom.

Now that the literature review and findings have been presented they will be used to derive answers to the original research questions.

Chapter Five

Summary and Discussion

Education is what remains after one has forgotten everything he learned in school.

~ Albert Einstein

In this chapter, a brief synopsis of the findings will be outlined followed by a detailed discussion and interpretation of the findings. Next, the relationship of this study to existing research will be presented, as well as recommendations for educators and suggestions for additional research.

The use of inquiry-based learning has been debated amongst educators for over one hundred years. Research has pointed towards inquiry-based learning as a teaching method, process, or philosophy. It has always been based on a constructivist paradigm that upheld learners as active participants in the learning process who "construct[ed] their own understandings of the world around them" by, incorporating past experiences and knowledge (Brown and Adams, 2001). A debate that has lasted this long seemed worthwhile exploring, therefore I undertook the current investigation and have attempted to answer a few of the questions that have been part of the ongoing debate. Likewise, defining the type of learning was a challenge in this research.

Synopsis of the results

Defining inquiry-based learning seemed to be a challenge for two of the three people interviewed. Ivy, the parent could not define it and Janet, the learning support teacher thought it was a difficult task to provide a definition. Mary, the classroom teacher provided a clear definition of IBL as a philosophical stance, a theory about learning, and one that she had lived out her entire teaching career. The definition of IBL presented by the teachers and outlined in the literature had an impact on the implementation practices. The definitions also impacted the

teacher and student roles and how prescribed curriculum was utilized. Both teachers agreed

that IBL was an innate way to differentiate instruction and considered it an inclusive practice.

Detailed Discussion of the Research Questions

1. How is inquiry-based learning defined as a philosophy or a teaching method?

   a) How does the definition impact implementation?

   b) How are teacher and student roles defined and implemented?

   c) How does the definition impact the use of curriculum?

Inquiry-based learning was defined in the literature as grounded in the philosophy of

constructivism (Dewey, 1996; Vygotsky, 2006; Apps and Carter, 2006; and Gilbert, 2009), a

philosophical stance (Mills and Donnelly, 2001), a process (Wilhelm, 2007; Chu, Tse, Loh,

Chow, Fung, and Rex, 2008), and as an approach to learning (Bell, 2010; Crick, Chang and

Wang, 2009).

Mary's definition of IBL as a philosophical stance agreed with educators like Dewey

(1996), Vygotsky (2006), Apps and Carter (2006), and Gilbert (2009). Mary's definition was a

"broad umbrella term," that aligned with Kahn and O'Rourke's definitions used for this text.

Mary described her definition as "big picture thinking." Mary had what Barrett (2005) called a

"total educational strategy" (p.1). She had a clear understanding of her personal beliefs and

philosophies and could quickly identify how they impacted her practice. Her philosophical

stance encompassed inquiry-based learning, social constructivism, inclusion, and the multi-

age classroom. Mary knew what her goals and aims were, she planned for them and

implemented them accordingly, but she was also flexible enough to allow student initiated

goals to emerge.

Mary's big picture thinking impacted who she was an educator and had an effect on everything she did throughout the day. Her philosophical stance was demonstrated in her relationships with the students, parents and her colleagues. Therefore her definition of IBL had a big impact on her implementation practices.

Janet's definition aligned more with Berghoff, Egawa, Harste, and Hoonan (2000) who used the term "multifaceted," that was also used by Janet. She defined IBL as "something that can happen during exploration, honouring a child's interests, stretching a child's interest or facilitating a project." These descriptions were in agreement with educators who defined IBL as an approach to learning. Janet also said she had a child-centered, experiential approach to teaching and believed that children needed to construct knowledge. Therefore she held to some tenets of a constructivist paradigm as well.

Janet did not have her own classroom space and stated that it was not her role to implement programs within the classroom setting. However, knowing her philosophy and beliefs was helpful as she supported the teachers in her pod. She said she had worked really hard to get to know the teacher's she supported and tried to "understand what motivated them, and what they wanted from their kids." Once a good relationship had been established, Janet felt that she could "try to mitigate [her] beliefs and philosophies" about what she considered to be best practices for the kids. Janet's definition of IBL impacted who she was an educator and how she implemented her philosophy and beliefs.

Teacher's Role

Mary and Janet both identified themselves as collaborators. Teele believed that teachers should set the example for "collaboration, respect, and appreciation of differences" (1996, p. 72). Teacher's need to be role models for their students and they need to create an

environment where students "are an active member of the learning process" (Teele, 1996, p. 72).

When I asked Mary about how often she collaborated with others she responded, "I feel like I am always in a collaboration of some sort." Mary said she collaborated with Janet, the school librarian, and another classroom teacher who also used an inquiry approach in the school. Janet collaborated with many other teachers and stated that the strength or weakness of the collaboration was based on the kind of relationship or, social interaction she had with each teacher.

Mary also collaborated with her students in one-on-one discussions, small group discussion and though larger class discussions. This ongoing collaboration created a democratic environment in the classroom as Mary consulted with the children and elicited their opinions by asking, "what do you think?" or "what are you wondering about." She modelled this mindset of wondering by starting many of her own discussions with the children saying, "I am wondering about..." Mary also encouraged co-collaboration amongst the children.

Collaboration could be defined as social-construction as each person adds to the plan and makes it better, so collaboration would be part of a constructivist paradigm. Participation in collaboration would be affected by the teacher's philosophy and beliefs. If a teacher saw themselves as "the boss" in the classroom they may feel less need to collaborate with colleagues or with the children.

Mary considered herself a guide and facilitator of the children's learning. She was not there to impart knowledge but to help her student's co-construct knowledge. She guided the children's learning through the invitations she set out. Mary needed to know what prior

knowledge students had, and what real-life experiences they brought to school each day in order to best guide and facilitate their learning. Having exploration time at the beginning of every day provided Mary with an opportunity to get to know her students. During exploration time she spent time conferencing, engaging in dialogues, and "kid watching" which helped Mary guide the children's learning.

Mary saw herself a planner, so she was in agreement with Parker (2007) that planning was an important part of an inquiry-based classroom. She spent many hours each week planning for and creating the invitations she set out. What Mary planned was impacted by her image of the child. She had a very positive image of the child and always showed respect towards the children as co-learners. Respecting a child's background and real life experiences was important to Mary and a demonstration of how she cared about each of the students as individuals. Mary's philosophical stance definitely had an impact on how she defined herself as a teacher.

Student Role

Mary had a child-centered focus and she identified and described the children as the "driving force" in the classroom. This did not mean that the children made all the decisions in the classroom; it meant that the individual children were the focus of Mary's thought process every minute of the day. As co-learners the children had lots of opportunities to make choices at their developmental level and within the parameters of "jobs" that needed to be done at school. She described a student-centered, student-driven approach similar to that of Bell (2010), who believed that student choice was a key element to IBL. Mary expected them to bring their interests, and their discoveries both individually and collectively to the classroom each day. Mary believed that students learnt from one another so she allowed and encouraged

sharing time throughout the day where students could share their ideas and received feedback, as suggested by Leonard and Penick (2009). Again, Mary's philosophical stance impacted her relationships with the children in her class and how she planned and prepared for them.

Use of Curriculum

Mary's focus on the children's prior experiences and the experiences she provided in the classroom impacted how she utilized the standardized curricula. Mary stated that she knew the early year's curricular outcomes because she had taught in an early year's classroom for twenty-seven years and could easily make connections to the curriculum. The findings presented in the data, provided some illustrations of how Mary connected the curriculum to the various activities being done in the classroom. The examples provided also demonstrated how she guided students towards making connections.

Mary did say that one of the times during the year she looked at curriculum was when she had a student teacher. The student teacher was expected to observe the class for a few days, and then Mary would ask them to look at the Science or Social studies curriculum. While looking through the curriculum the student teacher was to make curricular connections to what they had observed in the classroom. This was another example of how important it was to Mary that student's real life and experiences should be connected to the curriculum, as she focused on the child first, and curriculum second. Mary did not start with a learning outcome and sway the children's learning in that direction; she extended invitations and waited to see which direction the children took. Mary's philosophical stance had a direct impact on how she used the curriculum and made curricular connections.

Interpretation of Question 1

As reflected in this study and the literature reviewed, the interpretation of the definition of IBL has a direct impact on implementation practices, teacher and student roles, and on the use of curriculum. Inquiry-based learning is defined as both a philosophy and teaching method. If it is defined as a philosophy it impacts all aspects of implementation because the definition is more about who the teacher is, rather than what the teacher does. If it is defined a teaching method then the definition has less impact on the overall implementation strategies in the classroom. A teaching method is about what the teacher does in the classroom. Therefore, teachers who state they use an inquiry-based approach should be able to clearly define whether they consider it a philosophy, or teaching method.

Within the data presented there was no consensus on whether IBL was a philosophy, or teaching method, as educators aligned themselves with both. Mary expressed the idea that she thought of IBL as a philosophy, but that her action shows it as a method as well. IBL as a philosophy and it guided her daily practice. Having a clear understanding of one's philosophical stance and beliefs will help educators determine what will affect their implementation practices. For example: Janet did not believe in "pull out" programs where a small group or an individual child was removed from the classroom to work on what she called "skill and drill" exercises. Therefore if a teacher asked her to take a child and work with him or her on this type of activity she would say no, based on her own beliefs. She would then collaborate with the teacher about an activity that aligned with her philosophical beliefs and still met the needs of the child. Likewise, if the classroom teacher was asked to pilot a new reading program that did not support his or her own beliefs about reading, he or she would be able to explain why the specific program did not fit well in his or her classroom. Then a

discussion could pursue about other options that aligned better with the teacher's beliefs and

practices.

While in university a student begins to develop his or her philosophy and beliefs about

education, but this should be considered a fluid process. A teacher's philosophy should grow

and develop over time as she gains experience and has opportunities for experimentation.

However having a foundation to build from will benefit a new graduate as she moves into the

world of education. A foundation that will help determine implementation strategies in the

following areas: 1) class set up, 2) daily schedule, 3) role of the teacher, 4) role and

expectations of the students, and 5) approach to the curriculum. Each year a teacher has new

students in her classroom that will challenge and stretch her thinking about what they are

doing and why, so her philosophy and beliefs should continue to grow.

Establishing a clear understanding of one's beliefs and philosophies can be a challenge

as alluded to in this study. Even once a philosophy has been established defining inquiry-

based learning is still a challenge. If IBL is considered a philosophy, determining which

philosophy it is grounded in presents a further challenge. If IBL is grounded in the philosophy

of constructivism, the next question is what type of constructivism? Does it adhere to non-

positivistic ideas as suggested by Fosnot, or that of pragmatism as suggested by Dewey? Is

IBL part of a modern or post-modern paradigm? Answers to these questions will impact an

educator's definition of IBL and influence personal philosophies and beliefs. Ultimately the

definition will be reflected in the implementation practices of the educator.

For example, as a social constructivist which ideals should I use as my foundation? Do

I believe and follow the ideals of Vygotsky whose philosophy was rooted in Marxist ideals?

With a Marxist mindset would I then adhere to an educational philosophy that claims students

cannot learn without social interaction? Once I had established my educational philosophy I would need to determine what I was trying to accomplish and what outcomes I would focus on? Outcomes such as; is school about gaining new knowledge or helping the child become a good citizen, or both? Once the outcomes or goals have been established a framework for determining success would need to be established, and finally the methods that are going to be used to accomplish the goals would need to be explored. Or, perhaps I would choose to follow the ideals of pragmatism as Dewey did. Whatever foundational philosophical ideals I have and follow, will impact my educational philosophy and in the end the methods I choose to achieve the outcomes I establish. Once I have a clear understanding of my overarching philosophy I would then define IBL.

The challenge of defining IBL and then explaining how it is implemented can be a complicated task. IBL is not a list of teaching strategies that can be checked off and they are not strategies that can be identified as a reliable list that needs to be followed step by step. This is clearly one of the reasons it is still a pedagogy being debated today.

Inquiry-based learning is in many ways a methodology or philosophy that has sets of non-standardized outcomes which result in non-standardized implementation strategies. What educator A does, says and thinks about IBL, could be very different from educator B, yet who's to say educator A's approach is better than educator B's? What criteria would be used to assess the success of either educator? IBL can manifest itself in many ways and all could be considered appropriate. As outlined in the literature IBL can be an approach to curriculum applied in a small way to one subject area like science, or it can be as big as a philosophical stance that permeates every aspect of an educator's day.

One approach to IBL does not seem better than another; the key is to determine how IBL fits into an overall philosophy of education. Perhaps if educators took this approach there would not be less confusion about IBL and it would be utilized in more classrooms today.

Research Question 2

Do educators consider IBL an innate way of differentiating instruction? How is this demonstrated?

As Mary considered the needs, interests, experiences and developmental levels of each of her students she said her goal was to "differentiate for everyone." Mary believed that differentiating instruction was a "given" because the needs of each of her students were different Mary's focus on the individual made it possible, it seemed, for her to differentiate instruction almost with ease. She knew where each child was academically and she was very aware of their likes and interests. She knew which children gravitated to which center and how she could add new items to that center to provoke their learning and discussion.

Mary differentiated instruction during exploration and in both math and literacy workshops. The children played different math games depending on the skill they were working on; they had a variety of tools to help them solve math problems such as a hundred chart, 100 bead strings, power of ten cards, bean counters, clear bingo chips, and dominoes. Mary grouped children according to abilities during math workshop. During reading and writing workshop each child was working at their "just right" level.

Mary did consider IBL an innate way of differentiating instruction. She thought about all of her children individually, and in many ways planned for them as individuals, but she did not plan twenty-two individual lessons. Her big picture approach to her practice seemed to allow differentiated instruction to happen innately.

Janet agreed with Mary and said, "by the very nature of inquiry you were differentiating instruction. As [the teacher] is planning inquiries for children and planning spaces and opportunities, [he or she] is thinking about how to differentiate." She did go on to say that the two were not "mutually" exclusive and it really depended on the classroom teacher. "A non-inquiry based classroom teacher could be differentiating instruction, however by the very nature of inquiry you are differentiating instruction."

Interpretation of Question 2

My hypothesis was, if teachers used an inquiry-based approach in their classrooms they would naturally be differentiating instruction. Mary and Janet both consider inquiry-based learning an innate way of differentiating instruction. I think there is enough evidence to support this response. There were no major differences in the strategies of DI and IBL since they are both part of a "family" of approaches to curriculum design. In fact there are some common elements as presented in the literature review. These common elements create a mutual ground whereby inquiry-based learning could integrate principles of differentiated instruction. Differentiated instruction purports the use of multiple approaches to content, process and product. Both DI and IBL focus on the process rather than the product, the quality of what has been learned is more important than the quantity.

Inquiry-based learning and differentiated instruction are both based on a constructivist paradigm which impacts several elements of their principles, strategies, and the teacher's role. Following a constructivist paradigm IBL allows for students to give direction in their learning. This leads to curriculum being focused on the student's identified aims and goals. Since some students learning style is more goal or aim oriented, setting goals is also a method of differentiating instruction.

There are many strategies that can be implemented by a teacher using DI and IBL. Mary differentiated instruction every day and during each part of the day. She offered multiple ways for students to enter the learning process and she provided a good mix of basic instruction and practice. Mary described exploration time as having multiple entry points for the students to engage with each other and with their environment.

In order to differentiate instruction a teacher needs to know what life experiences and knowledge a child brings to the classroom. Mary did this innately throughout the day as she "kid watched", in her words, and documented what she saw. The way Mary structured her day had a lot to do with how much "kid watching" she did. Starting each day with exploration allowed Mary ninety minutes of uninterrupted time to spend working one-on-one with students or in small groups, a strategy used to differentiate instruction. It allowed her to observe what interested the children which led to her extending their learning thus differentiating for them. Mary also had lots of what she called, "stuff" in her classroom which allowed for differentiation to happen in a somewhat spontaneous way.

Presenting students with problems, or open ended questions to solve is another way a teacher could choose to differentiate instruction. By solving problems the student will often acquire critical thinking skills which may lead to further inquiries suggested by the students. i.e. the bat inquiry referenced in the data findings. When students solve problems together they are learning from one another which helps develop their zone of proximal development as suggested by Vygotsky.

If a teacher follows the tenets of IBL I suggest they will be innately differentiating instruction. Perhaps not all students will be working on the same curriculum but the learning outcomes can still be fulfilled in an engaging and joyful environment. If the educator takes a

holistic approach to his or her philosophy like Mary did, it seems the likelihood of DI

happening innately on a consistent basis would be higher than for an educator who envisions

inquiry as a part of the day. Just as the definition of IBL impacted implementation, I think it

will impact the amount and quality of differentiation used by the teacher. I found no evidence

in the literature that others have considered IBL an innate way to differentiate instruction so

this study has added something new to the literature.

Use of Technology and Differentiated Instruction

As mentioned in Chapter four, the province where this study was done there is a

Literacy with ICT document and ICT continuums for use in the schools. However, Mary and

Janet felt that computers as technology did not have a place in an early year's classroom.

Mary's focus was on providing the children with "real world" experiences and seemed to be

saying that computers and technology were not part of the "real world" of a child living in the

21st Century. This was a little perplexing to me because I think that technology is a part of,

and will continue to be part of, a child's world. I also think that technology can be used to

enhance an inquiry like the one Mary was doing about bats. The literature also pointed

towards many uses of technology for differentiating instruction. Mary stated that her response

to technology "fit" within her philosophy.

Mary and Janet's response did however seem to side with the research produced in

1995 by The Office of Technology Assessment (OTA) survey, *Teachers and Technology:*

Making the Connection. The survey reported that "widespread, in-depth integration of

educational technologies with curriculum has not taken place." Harwell, Gunter, Montgomery,

Shelton and West reported similar findings in 2001. "Teachers are not using technology for

higher, complex, learner-centered tasks such as online searching and investigations, online

collaboration projects within the classroom and with outside groups, complex simulations to understand cause and effect, electronic portfolios, graphic and visual tool analysis, self exploration of learning, and presentation of results" (2001, p.260).

However on this particular point I disagreed with Mary and Janet, as I think that technology should be explored in every classroom especially in the area of differentiated instruction. Technology can be used to level the playing field for some children so if an educator wants to create an inclusive environment I think technology should be used.

Research Question 3

Is IBL an inclusive practice?

Mary encompassed an attitude of inclusion, and she tried hard to create an inclusive space where all children felt accepted. Some examples of exclusion were observed. In reflecting on these situations, it is possible the physical lay out in the classroom contributed to these behaviours. The little group of girls who spoke a common language were at the art table every day during exploration. The art table was located in the back corner of the room and was a low table with no legs. On three sides of the table there were wooden book shelves so unless Mary was right at the table she could not see or hear what was going on there. Perhaps if the art table had been moved into a more visible place it may have had an impact on the girl's behaviour. They should not have been asked to stop speaking in their own language but perhaps they could have been encouraged to make sure they also spoke in English if others wanted to join their center.

As far as the child with special needs who was ostracized from time to time, when alerted to this the classroom teacher did talk about the possibility of providing some support for him during exploration. During the second term a paraprofessional was in the classroom

during the first ninety minutes of the day who supported Timmy with his social interactions.

The teacher also gave him a choice card for exploration time that has five pictures on it of five

different activities, Timmy is to choose three of them. Mary reported that this has helped him

become more engaged during the exploration time. All these strategies should help him feel

more a part of the classroom community and hopefully as he gains some social skills and

language he will be more accepted in the classroom.

Mary's desire and belief was that her classroom should be inclusive, and it really

bothered her when it was not. Mary practiced what she believed and was pro-active about the

situations where exclusion happened. She modelled an inclusive attitude, she talked to the

students about making everyone feel a part of the group, she spoke to parents and she

advocated for support for Timmy. Mary believed in inclusion as it was part of her overall

philosophy and beliefs. There were many opportunities for the children in Mary's class for

everyone to learn.

Mary's philosophy and beliefs encompassed an inclusive stance. Mary modelled

inclusive language, actions and attitudes for the children and she intervened as soon as she

saw behaviours that were exclusive.

Interpretation of Question 3

The literature presented provided both sides of the argument about IBL and inclusion.

From the research study conducted, I have concluded that IBL can be an inclusive practice.

All students are capable of learning and problem-solving with the utilization of differentiated

instruction. IBL provides ongoing opportunities for students with special needs to be educated

in the regular classroom. An inquiry-based approach grounded in a constructivist paradigm

encourages children to construct knowledge in whatever way they can. According to the

definition used for this text inclusion is a process of addressing and responding to the diversity of needs of all learners.

Addressing and responding to the needs of all students can be achieved by differentiating instruction. Differentiating instruction is based on the belief that all students can learn if the right opportunities are provided. Differentiated Instruction is "a set of strategies that will help teachers meet each child where they are when they enter class and move them forward as far as possible on their educational path" (Levy, 2008, p.162). Teachers in a DI classroom consider the whole child and the individuality of each child so DI would be considered inclusive from that perspective. The teacher also "embraces the recognition of cultural, familial, and academic differences among students" (Smith & Throne, 207, p. 6) which implies all differences are accepted in the classroom so DI would be considered an inclusive strategy.

At the heart of inclusion is the belief that all children can and have the right to an education. This mindset should be the foundation for all educators' philosophy and belief system. At the end of this study it has become obvious that all three research questions have been impacted by exactly that, the definition of a philosophy and statement of beliefs. Defining IBL as a philosophy leads to one level of implementation and defining it as a teaching method leads to another, but the definition was embedded in an overall philosophy and belief about education.

An educator can have a clear understanding of his or her own philosophy and be able to define and explain it to others, however, no matter how great the philosophy is all educators face challenges as they try to meet the needs of their students.

Challenges to using inquiry-based learning

Throughout the literature challenges to using IBL were presented which could point to why IBL is not used by more educators. One of the challenges mentioned several times was keeping students motivated throughout the inquiry process. Edelson, Gordon, and Pea (1999) found this in the study they conducted with high school students. They researched the use of computer technology supporting inquiry learning through the use of a climate visualizer. They discovered several challenges along the way along with regards to keeping students motivated. The first challenge was the inadequate training provided for the teachers and the students in using the software (Edelson, Gordon, and Pea, 1999, p.411). This meant that when students got stuck on something the teacher was not able to help them and keep them moving forward. One of the de-motivating factors identified was losing sight of the original question or aim. This was a concern of Dewey's as well, that students would get lost in the inquiry and forget the initial focus leading to a drop in motivation.

Krajcik, Marx, Blumenfeld, Blunk, Crawford, Kelley, and Meyer (1998) identified challenges for teachers using IBL in their study. They presented four case studies of four teachers in a middle-school setting who were trying an IBL approach. Challenges such as: 1) time "there never seemed to be enough time to do each activity well, and the teachers often had to end an activity with no follow-up" (p. 535), 2) classroom management or the "belief that order needs to be maintained to control students' cognition" (p. 536), 3) control over the flow of information, 4) support of student learning as they found it hard to differentiate, 5) they lacked experience in incorporating technology into the classroom, 6) and in the area of assessment, teachers weren't sure how to assess in an IBL classroom.

Other challenges teachers could face in using an IBL approach are where to access all the materials needed for the students to utilize in their inquiry. This would include the hands-on materials as well as pointing students in the right direction on the internet. "Significant time is often involved in the search of relevant resources. If a sufficient set of relevant resources has already been collated (by the teacher) then the time for searching will be reduced" (Kahn and O'Rourke, 2005, p.4). This also assumes that the teacher knows where to look for the resources, which is not always the case.

One final challenge or stumbling block for teachers using IBL is identified by Lutfiyya and Van Walleghem (2001) in an overview of special education in Manitoba. They point out that "teachers working with students with special learning needs in Manitoba may have (had) no relevant training in the area. (Especially since) the bulk of the training in special education happens at the post B. Ed, level" (p. 88). Teachers would therefore find themselves in a position of teaching students they felt ill prepared to teach. Lack of training makes everyone feel inadequate so lack of training in IBL would hinder teachers from trying it out as a curriculum alternative.

All these challenges point towards the implementation of IBL as difficult, which may be why more teachers do not use this approach. Future research may provide solutions to the numerous challenges to using IBL.

Suggestions for Further Research

This study was conducted on a very small scale so the findings should not be generalized to other situations. Thomas (2000) pointed out in his survey of IBL research that all the research conducted had very little influence on its increased use even though much of the research pointed towards positive outcomes. He believed this was due to several

mitigating factors: many teachers have not been exposed to IBL, research is not readily

available to teachers, and that there is "no widely accepted framework or theory of IBL" (p.

35). He suggested the following future research ideas as possible solutions: 1) a comparison of

the different IBL models currently being used and their effectiveness, 2) research on best

practices considering "procedural facilitation" and "grassroot interventions" that have been

implemented successfully 3) additional research on the challenges teachers face using a IBL

approach, 4) the kinds of training and support needed for teaches to be successful at

implementing IBL (p. 36-38).

Thomas also suggested further research looking at age, sex, demographic

characteristics, ability, disposition and motivation as well as how IBL might impact reluctant,

low achieving and disengaged students – could it help make them more motivated and

engaged? What will constitute evidence that IBL is effective in all subject areas? Can IBL

reduce the gap between socioeconomic groups? Do students transfer what they have learned

into other settings? How has the classroom culture changed as a result of using IBL? (p.36-

38).

Hmelo-Silver (2004) proposed further research in the K-12 grades to look at

motivation and collaboration. They think asking questions such as can elementary students be

self-directed learners? how can scaffolding be used for different learners? is some direct

instruction necessary for younger students? and which facets of IBL are important to

particular outcomes? should be pursued (p. 260-261).

I agree with these suggestions and in the following section propose some

recommendations for educators and further research.

Recommendations for Educators

Based on the findings of this study I make the following recommendations:

1) Educators should be able to define their philosophy of education. This defined philosophy should directly impact classroom implementation, the definition of their own role and the role of their students, and ultimately how they use the provincially prescribed curricula. Presently in the Bachelor of Education at the University of Manitoba, there is only one course within the two-year program that is specifically focused on helping students establish their beginning philosophy of education. As already stated this initial philosophy is the foundation to the work new teacher's will do as they start in the classroom. It is important for a new graduate to know what kind of classroom environment they want to create, what their goals and aims are, and what methodology will they use to achieve these goals. The answer to all these questions should come from a teacher's educational philosophy.

The foundation for establishing a solid philosophy of teaching should occur at the pre-service level, but is something that needs to continue to be honed as an educator gains experience. In order to stay focused educators should be lifelong learners themselves. All educators should be reading professional material, engaging in professional dialogue and attending professional development sessions so they can become even more grounded in their own philosophy and beliefs.

2) Instruction related to inquiry-based learning may not always occur as part of an undergraduate degree in Manitoba, and is not typically the type of teaching approach students see during their practicum. I would recommend that teacher candidates learn about inquiry-based learning in their undergraduate studies and have an opportunity to

spend part of their practicum in an IBL classroom. An IBL classroom promotes inclusion and differentiated instruction which are both found in the Manitoba School Act. Teachers in Manitoba are mandated to include all students in the classroom and to differentiate instruction for them. This is an overwhelming task to both new and experienced teachers, which is why I am recommending that students research and learn about IBL during their undergraduate work. If they can see how using an IBL approach can help them think in an inclusive way and naturally differentiate instruction the challenges of the classroom may not seem as overwhelming. Providing an insight into IBL prior to graduation would give the new teacher another tool in her toolbox. This may encourage the teacher to continue her own investigation into IBL as she gains experience and constructs further knowledge.

Additional Research Ideas

1) How does an educator's philosophy of education impact their implementation practices?

This could be a blended qualitative and quantitative study that would collect data from a questionnaire for teachers about their philosophy and beliefs, followed by observations in the classroom to see if the teachers practice aligns with his or her stated philosophy. A checklist could also be used during the observations that would indicate how many times a certain activity was implemented. For instance if a teacher said they believed in a "hands-on" approach to learning a check mark could be made each time this was observed. It would be good to have enough data to compare and contrast how many teachers implementation practices line up with their stated philosophy, so between 10 and 15 teachers could be recruited.

2) Is IBL an innate way of differentiating instruction?

The same study presented here could be used with more teachers to determine if what was

discovered in this small study is applicable on a broader scale. A qualitative study using

interviews and observations could be conducted, with between 10 and 15 teachers who

use an inquiry-based approach. The research questions could be streamlined to a) how do

you define IBL?, and b) do you consider IBL and innate way of differentiating

instruction? With more data, a bolder statement about IBL being a good approach to

differentiating instruction could be made and it might encourage more teachers to

investigate and try an IBL approach in their classroom.

A third suggestion for further research would be to investigate the success of an inquiry

based approach. There have been studies done to show that IBL is an effective pedagogy but it

would be worthwhile to establish some criteria of success and then assess both and IBL and

teacher directed classroom in order to compare and contrast them.

3) How do educators determine if their students are gaining knowledge and moving

forward in an IBL classroom? Are the students learning how to read and write and

become proficient communicators and problem solvers? Is there quantitative data that

shows that IBL is indeed a positive pedagogy? All those questions could be tied

together in a mixed-method study that would compare IBL classrooms to teacher

directed classrooms. A researcher could use some standardized tests at the beginning

of grade 1, 3 and 5 and again at the end of the year and compare student scores from

both classrooms. Along with the tests, data could be collected by doing observations

in the classrooms and interviewing the teachers. The researcher could also use

standardized tests that would assess the moral development or citizenship qualities to

compare and contrast between the different classrooms. With some quantitative data

to add towards the argument for IBL being a positive pedagogy, perhaps more

teachers would be willing to consider the tenets of the approach.

Conclusion

Having spent time reading about and researching Inquiry-Based Learning I realized

that my own school experience could have been very different if I had been in a classroom

like Mary's. My sense of wonder about the world and my numerous questions would have

been welcomed by Mary. My experience over the last two years has encouraged me to

continue focusing on IBL as a teaching philosophy and modelling this philosophy in my work

place. I will continue to encourage educators to consider exploring an IBL approach especially

when the topic of differentiated instruction is raised.

This study has contributed to linking IBL to differentiated instruction and inclusion.

IBL and DI are *based* on the constructivist paradigm, IBL is grounded in constructivist

principles and practices. Constructivists believe that all knowledge is personal and based on

one's life experience and interpretation of that experience. "It views knowledge as temporary,

nonobjective, internally constructed, developmental, and socially and culturally mediated"

(Yilmaz, 2008, p.162). Following a constructivist paradigm IBL allows for students to give

direction to their learning which leads to establishing curricula based on the student's

identified aims and goals.

DI purports the use of multiple approaches to content, process and product which

could be implied in an IBL approach since, it is student directed and each student would

approach his or her learning in a variety of ways. Therefore, all the principles of DI can easily

be incorporated into the principles of IBL. By using IBL a teacher is differentiating instruction

by virtue of the process of curriculum development.

All students are capable of learning and problem-solving with the utilization of

differentiated instruction. What philosophical beliefs and stance an educator has and how

clearly he or she can define them has an impact on all aspects of implementation. If an

educator believes in an inquiry approach that encourages interaction, collaboration,

experimentation, expression of ideas and thoughts, movement, student interests, construction

of knowledge, and educative experiences, then he or she would find themselves innately

differentiating instruction in an inclusive way. Inquiry-based learning "is part of a shift from

the teaching paradigm to the learning paradigm. The focus is on what students are learning

rather than what the teacher is teaching" (Barrett, 2005, p. 14).

> In earlier days the teacher was sitting alone in a fully loaded boat almost sinking, and the
>
> poor teacher was trying to row with the last energy he had. After PBL (IBL) the tutor is
>
> sitting in a boat with a group and guiding while others are rowing and eagerly looking
>
> ahead (Barrett, 2005, p.19).

The second scenario would be preferable to most teachers and one that is attainable with

the desire, patience and practice. However, this shift has not taken place in many classrooms

even though the research situates IBL as a positive pedagogy. As the diversity of the

classroom continues to increase teachers will need to evaluate what "teaching" is in the 21st

Century. Do students need a teacher leading from the front or a teacher who is capable of

sharing the teaching with his or her students? Differentiated instruction will no longer be an

option it will be a necessity in order for diverse students to gain new knowledge. By adopting

IBL, DI will be taking place. All students working towards the same learning outcomes;

becoming problem-solvers, critical thinkers, collaborators, learners, teachers, leaders,

diplomats, and people inclusive in their thoughts and actions.

The strongest recommendation for an inquiry approach is that it motivates students,

which in turn leads them to engage with seminal concepts and strategies, which in turn

can be used as tools for achieving true understanding. …What we want for our students is

for them to be able to participate in disciplinary conversations … as democratic citizens

weighing in on the issues that affect us all. After all, as Dewey maintained, democracy is

conversation (Wilhelm, 2007, p.165).

Hopefully this conversation will continue as educators discuss and debate the use of

inquiry-based learning in they try to meet the diverse needs of all their learners.

Glossary

Differentiated instruction (DI): In 1996 the government of Manitoba produced a document

called *Success for All Learners: A Handbook on Differentiated Instruction.* This document

defined DI as a "means (of) offering students multiple options at each stage of the learning

process. It recognizes that there are many avenues to reach student learning outcomes and that

each student needs a complex and unique mix of basic instruction and practice to reach his/her

full potential" (1.5).

Experiential learning theory: Kolb's theory of experiential learning was based on the works

of John Dewey's theory of experience, Piaget and Lewin. He defined learning as "the process

whereby knowledge is created through the transformation of experience. Knowledge results

from the combination of grasping experience and transforming it. … The simple perception

of experience is not sufficient for learning; something must be done with it" (Kolb, 1984, p.

41).

Grounded theory: a theory developed from the data collected in a phenomenological study. It

is typically derived from interviews with participants who have experienced the phenomenon

being explored. The interviews are then coded for theme and a hypothesis or theory is

developed from the themes (McMillan, 2008).

Inclusion: a process of addressing and responding to the diversity of needs of all learners

through increasing participation in learning, cultures and communities, and reducing exclusion

within and from education (Booth, 1996). It involves changes and modifications in content,

approaches, structures and strategies, with a common vision which covers all children of the

appropriate age range and a conviction that it is the responsibility of the regular system to

educate all children (UNESCO, 1994, p. 20).

Inquiry-based learning (IBL): Inquiry-Based Learning according to Kahn and O'Rourke is a "broad umbrella term to describe approaches that are driven by a process of inquiry" (2005, p.1) It is based on the constructivist paradigm touted by John Dewey and others that "posits … knowledge is not passively received from the world or from authoritative sources but constructed by individuals or groups making sense of their experiential worlds. … Learners are intellectually generative individuals (with the capacity to pose questions, solve problems, and construct theories and knowledge) rather than empty vessels waiting to be filled" (Yilmaz, 2008, p. 162). For the purpose of this study IBL will be used as an umbrella term as suggested by Kahn and O'Rourke.

Naturalistic inquiry: A form of Qualitative research concerned about gathering data in a natural setting such as a classroom. The researcher gathers data at the source because they are concerned about context. "Human behavior is significantly influenced by the setting in which it occurs, [so] whenever possible" data should be collected in its natural setting (McMillan, 2008, p. 5).

Observations: An observation refers to the visual observation and written record of behaviors as they naturally occur in natural settings. This kind of seen, then written, data collection "allows the researcher to take into account important contextual factors that my influence the interpretation and use of the results" (McMillan, 2008).

Phenomenology: The purpose of a phenomenological study is "to describe and interpret experiences of participants in order to understand the 'essence' of the experience as perceived by the participants" (McMillan, 2008, p. 291). Phenomenological research moves from the "concrete description of the experience of the subjects … to the interpretation of his/her experience, instead of making abstract explanations about the experiences of the subject

without following and understanding the descriptions of his/her experience as it is given in his/her consciousness" The focus of the study is on hearing the participant's voice and "grasping the whole meaning" of the experience the subjects have had (De Castro, 2003). The researcher is trying to comprehend the real life experience of the subject or in other words the essence of the phenomenon.

Problem-based learning (PBL): "PBL is an instructional method that encourages learners to apply critical thinking, problem- solving skills, and content knowledge to real-world problems and issues. … Learning is active rather than passive, integrated rather than fragmented, cumulative rather that isolated, and connected rather than disjointed" (Levin, 2001, p. 1). According to Levin (2001) PBL is also based on a constructivist paradigm (p.3).

Reflective journal notes: Reflective journal notes are taken after the researcher has completed an observation. They are for the purpose of writing recording the researcher's subjective feelings about each observation. "The emphasis is on speculation, feelings, problems, ideas, hunches, impressions and prejudices" (Bogdan and Biklin, 2007, p. 122) giving the researcher an opportunity to ponder and reflect on what they observed.

Social constructivism: It is assumed that learners have to construct their own knowledge – individually and collectively. Each learner has a tool kit of concepts and skills with which he or she must construct knowledge to solve problems presented by the environment. The role of the community – other learners and teacher – is to provide the setting, pose the challenges, and offer the support that will encourage mathematical construction (Davis, Maher, and Noddings, 1990, p.3).

Student-centered learning: Student-centered learning requires students to set their own goals for learning, and determine resources and activities that will help them meet those goals (Jonassen, 2000).

Students with special needs: Students with special needs include students with significant cognitive disabilities, students learning English as an additional language, students with physical disabilities, students with learning disabilities, and students with behavioural problems (Success for all learners, 1996, p. 2.4).

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Appendix A

Howard Gardner's Multiple Intelligences

Linguistic intelligence ("word smart") thinks in words, needs books and writing materials.

Logical-mathematical intelligence ("number/reasoning smart") thinks by reasoning, needs to explore using hands-on materials.

Spatial intelligence ("picture smart") thinks in images and pictures, needs art, pictures, games.

Bodily-Kinesthetic intelligence ("body smart") thinks through bodily sensations, needs to move and likes hands-on learning.

Musical intelligence ("music smart") thinks via rhythms and melodies, needs music and movement.

Interpersonal intelligence ("people smart") thinks by talking to others, needs to socialize and be in groups.

Intrapersonal intelligence ("self smart") thinks by reflection, needs to be alone and prefers self-paced projects.

Naturalist intelligence ("nature smart") thinks by interacting with nature and the environment, needs time in nature and movement (Peterson J.M. and Hittie M. 2004, p. 174-175).

Appendix B

Letter of Informed Consent – Superintendant Seven Oaks School Division

Title of Thesis Study: An Investigation of Inquiry-Based Learning in Inclusive Classrooms.

Researcher: Alison Wells

This consent form, a copy of which will be left with you for your records and reference, is only part of the process of informed consent. It should give you the basic ideas of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

This letter is a request to contact the principal of a school in 7 Oaks school division via his work phone or email in order to ask permission to contact his staff about participating in research I will be conducting during the months of October – December 2010. I am conducting research for my thesis in order to complete a Master's in Inclusive Special Education through the faculty of Education, University of Manitoba. My faculty advisor is Dr. Charlotte Enns. I would like to provide you with more information about this project and what staff involvement would entail if they decide to take part. Once I have received your permission, the principal of the school will be contacted and asked to sign an informed consent letter so he is fully aware that their staff may be participating in my research.

Attached is an exact copy of what will be sent to the principal (Note: this was included in the original letter).

The purpose of this study is to investigate how educators define and practice inquiry-based learning in inclusive classroom settings in elementary schools in urban Winnipeg.

Your signature on this form indicates that you have understood to your satisfaction the information regarding your staff participation in the research project and agreement for me to forward my email to your staff. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time and/or refrain from

answering questions you prefer to omit, without prejudice of consequence. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

This research has been approved by the Education Nursing Research Ethics Board. If you have any concerns or complaints about this project you may contact any of the above-named persons or the Human Ethics Secretariat at 204-474-7122. A copy of this consent form has been given to you to keep for your records and reference.

I look forward to speaking with you and I thank you in advance for your assistance in this project.

If you have any questions regarding this course project, or would like any additional information to assist you in reaching a decision about participation, please contact me by email at awells18@shaw.ca or at 204-253-0772. You can also contact my faculty advisor De Charlotte Enns by email ennscj@cc.umanitoba.ca or at 204-474-9017.

Your signature on this form indicates that you have understood to your satisfaction the information regarding participation in the research project and agree to participate as a participant. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time and/or refrain from answering questions you prefer to omit, without prejudice of consequence. Your continued participation should be as inform as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

_____

Superintendent's Name (please print)

_____

Superintendant's Signature   Date

I am agreeing to:

_____ grant permission for the student researcher Alison Wells to contact principals at XXXXXX school and YYYYYYY school in XXXXXXX School Division.

I would like a summary of the results yes/no. Results to be sent to the following address

_____

Appendix C

Letters of Informed Consent – Principal

UNIVERSITY
OF MANITOBA

Title of Thesis Study: An Investigation of Inquiry-Based Learning in Inclusive Classrooms.

Researcher: Alison Wells

This consent form, a copy of which will be left with you for your records and reference, is only part of the process of informed consent. It should give you the basic ideas of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

This letter is a request to send a recruitment letter that I have drafted via email to your staff in order to invite them to participate in research I am conducting for my thesis. This study is for the completion of my Masters in Inclusive Special Education in the faculty of education at the University of Manitoba. My thesis advisor is Dr. Charlotte Enns.

I would like to provide you with more information about my research and what staff involvement would entail if they decide to participate. The purpose of this study is to investigate how educators define and practice inquiry-based learning in inclusive classroom settings in an elementary school in urban Winnipeg. I have chosen XXXXXXX School because of its well known approach to Inquiry-Based Learning in several of the early year's classrooms. I had an opportunity to observe in several of these classrooms during the 2009-2010 school years and feel your school would be a good fit for my research. I will be asking the teacher and students to make a commitment of one month in which I will visit their classroom three times a week for four weeks. I will be in the classroom making observations for half a day each time. The dates and times will be pre-arranged with the teacher as soon as I have all the signed consent forms in place. I will be asking all the students to sign an assent form (attached) prior to making any visits to the classroom.

Since one of my main research questions is asking how inclusive Inquiry-Based Learning is, I will be looking for a classroom that has special needs students in it. I will also be seeking permission to interview the parents of the special needs children. I am looking to recruit a teacher who collaborates with another adult in the building. This other adult could be the librarian, the learning support teacher, guidance counsellor or a colleague.

All interviews with teachers and parents will be recorded on a digital voice recorder and stored on my password protected computer. The only people who will have access to my data are I and my faculty advisor Dr. Charlotte Enns. Once my thesis marks have been posted all data will be erased from my computer and all typed transcripts shredded and recycled.

All my observations will be recorded in writing by myself and read only by myself and possibly my faculty advisor. I will keep a journal with my written observations, as well as a reflective journal that will have my personal thoughts and questions in it. Both journals will be kept in a locked box in my home office and written transcripts will be kept on my password protected computer. All journals will be shredded once my final thesis marks are posted.

Pseudonyms will be used in order to protect each child and adult's anonymity and confidentiality.

Participation for all will be voluntary and no remuneration will be given to any participants in my study. There will be no risks to the participants who can withdraw from the study at any point by simply letting me know they wish to withdraw. This can be verbally or in writing.

I have appended a copy of the recruitment letter and informed consent letter that would be sent to your staff upon receipt of this signed consent form as well as the interview questions (Note: these letters were included in the original letter).

Your signature on this form indicates that you have understood to your satisfaction the information regarding your staff participation in the research project and agreement for me to forward my email to your staff. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time and/or refrain from answering questions you prefer to omit, without prejudice of consequence. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

This research has been approved by the Education Nursing Research Ethics Board. If you have any questions regarding this study, or would like any additional information to assist you in reaching a decision about participation, please contact me by email at awells18@shaw.ca or at 204-253-0772. You can also contact my faculty advisor Dr. Charlotte Enns by email ennscj@cc.umanitoba.ca or at 204-474-9017.

I look forward to speaking with you or reading your responses and I thank you in advance for your assistance in this project.

I am agreeing to: (please check the ones that are applicable to you).

_____ allow the researcher, Alison to contact my staff about their participation in her thesis research.

I would like a summary of the results yes/no. Results to be sent to the following address:

Principal's Name (please
print)_____

Principal's Signature   Date

Researcher's Signature   Date

Appendix D

Letters of Recruitment

Teachers

UNIVERSITY
OF MANITOBA

Researcher: Alison Wells

Title of Research Study: An Investigation of Inquiry-Based Learning in Inclusive Classrooms.

I am a learning support teacher in XXXXX School Division as well as a Master's student at the University of Manitoba. I am currently working on my thesis and am in the data gathering stage. I would like to take this opportunity to invite you to be a vital part of my research by allowing me to interview you twice and to make 10- 12 visits in your classroom to make observations and record field notes. The interview process would take approximately one hour in length each time to take place in a mutually agreed upon location outside of work hours (interview questions attached). You may decline to answer any of the questions if you so wish. I would interview you once prior to making my observations and once again after I have completed my observations. You may decline to answer any of the questions if you so wish. Furthermore, you may decide to withdraw from the study at any time and without penalty by advising the researcher. My plan is to interview parents of students in your classroom who have special needs as I am investigating whether IBL is truly inclusive.

Upon receipt of this letter I will contact you in regards to completing a letter of informed consent that you will be required to sign. Once the letter of signed consent is completed we will proceed with setting an initial interview date.

If you have any questions regarding this course project, or would like any additional information to assist you in reaching a decision about participation, please contact me by email at awells18@shaw.ca or at 204-253-0772. You can also contact my course advisor, Dr. Charlotte Enns by email ennscj@cc.umanitoba.ca or at 204-474-9017.

Your signature on this form indicates that you have understood to your satisfaction the information regarding participation in this research project and agree to participate as a

participant. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time and/or refrain from answering questions you prefer to omit, without prejudice of consequence. Your continued participation should be as informed as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

This research has been approved by the Education Nursing Research Ethics Board. If you have any concerns or complaints about this project you may contact any of the above-named persons or the Human Ethics Secretariat at 204-474-7122. A copy of this consent form has been given to you to keep for your records and reference.

I look forward to speaking with you and I thank you in advance for your assistance in this project.

_____

Participant's Name (please print)

_____

Participant's Signature   Date

Participants Contact information: please contact me by phone _____ or through e mail at _____.

Researcher's Signature   Date

I am agreeing to: (please check the ones that are applicable to you).

_____ contacted by the student researcher, Alison Wells, in order to complete an informed consent and participate in her research.

I would like a summary of the results yes/no. Results to be sent to the following address

Recruitment Letter

Learning Support Teachers

Researcher: Alison Wells

Title of Research Study: An Investigation of Inquiry-Based Learning in Inclusive Classrooms.

I am a learning support teacher in XXXX School Division as well as a Master's student at the University of Manitoba. I am currently working on my thesis and am in the data gathering stage. I would like to take this opportunity to invite you to be a vital part of my research by allowing me to interview you about your role as a learning support teacher in the school and in XXXXXX classroom. The interview process would take approximately one hour in length to take place in a mutually agreed upon location outside of work hours (interview questions attached). You may decline to answer any of the questions if you so wish. You may decline to answer any of the questions if you so wish. Furthermore, you may decide to withdraw from the study at any time and without penalty by advising he researcher.

Upon receipt of this letter I will contact you in regards to completing a letter of informed consent that you will be required to sign. Once the letter of signed consent is completed we will proceed with setting an initial interview date.

If you have any questions regarding this course project, or would like any additional information to assist you in reaching a decision about participation, please contact me by email at awells18@shaw.ca or at 204-253-0772. You can also contact my course advisor, Dr. Charlotte Enns by email ennscj@cc.umanitoba.ca or at 204-474-9017.

Your signature on this form indicates that you have understood to your satisfaction the information regarding participation in this research project and agree to participate as a participant. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time and/or refrain from answering questions you prefer to omit, without prejudice of consequence. Your continued participation should be as informed

as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

This research has been approved by the Education Nursing Research Ethics Board. If you have any concerns or complaints about this project you may contact any of the above-named persons or the Human Ethics Secretariat at 204-474-7122. A copy of this consent form has been given to you to keep for your records and reference.

I look forward to speaking with you and I thank you in advance for your assistance in this project.

_____

Participant's Name (please print)

_____

Participant's Signature   Date

Participants Contact information: please contact me by phone _____ or through email_____.

Student Researcher's Signature   Date

I am agreeing to: (please check the ones that are applicable to you).

_____ contacted by the student researcher, Alison Wells, in order to complete an informed consent and participate in her research.

I would like a summary of the results yes/no. Results to be sent to the following address

Recruitment Letter

Parents

Researcher: Alison Wells

Title of Research Study: An Investigation of Inquiry-Based Learning in Inclusive Classrooms.

I am a learning support teacher in XXXXX School Division as well as a Master's student at the University of Manitoba. I am currently working on my thesis and am in the data gathering stage. I would like to take this opportunity to invite you to be a vital part of my research by allowing me to interview you about your child's experience in XXXXXX classroom. The interview process would take approximately one hour in length to take place in a mutually agreed upon location (interview questions attached). You may decline to answer any of the questions if you so wish. You may decline to answer any of the questions if you so wish. Furthermore, you may decide to withdraw from the study at any time and without penalty by advising the researcher.

Upon receipt of this letter I will contact you in regards to completing a letter of informed consent that you will be required to sign. Once the letter of signed consent is completed we will proceed with setting an initial interview date.

If you have any questions regarding this course project, or would like any additional information to assist you in reaching a decision about participation, please contact me by email at awells18@shaw.ca or at 204-253-0772. You can also contact my course advisor, Dr. Charlotte Enns by email ennscj@cc.umanitoba.ca or at 204-474-9017.

Your signature on this form indicates that you have understood to your satisfaction the information regarding participation in this research project and agree to participate as a participant. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time and/or refrain from answering questions you prefer to omit, without prejudice of consequence. Your continued participation should be as informed

as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

This research has been approved by the Education Nursing Research Ethics Board. If you have any concerns or complaints about this project you may contact any of the above-named persons or the Human Ethics Secretariat at 204-474-7122. A copy of this consent form has been given to you to keep for your records and reference.

I look forward to speaking with you and I thank you in advance for your assistance in this project.

_____

Participant's Name (please print)

_____

Participant's Signature   Date

Participants Contact information: please contact me by phone _____ or through email_____

Student Researcher's Signature   Date

I am agreeing to: (please check the ones that are applicable to you).

_____ contacted by the student researcher, Alison Wells, in order to complete an informed consent and participate in her research.

I would like a summary of the results yes/no. Results to be sent to the following address

Appendix E

Letter of Informed Consent

Teachers

Title of Thesis Study: An Investigation of Inquiry-Based Learning in Inclusive Classrooms.

Researcher: Alison Wells

This consent form, a copy of which will be left with you for your records and reference, is only part of the process of informed consent. It should give you the basic ideas of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

This letter is an invitation to participate in the thesis research I am conducting in order to complete my Master's in Inclusive Special Education with the faculty of Education, University of Manitoba. My thesis advisor is Dr. Charlotte Enns. I would like to provide you with more information about my research and what your involvement would entail if you decide you would like to take part.

The purpose of this research is to investigate how educators define and implement inquiry-based learning in inclusive classroom settings in elementary schools in urban Winnipeg.

Participation in this research is voluntary. It will involve allowing me to be part of your classroom space for five to eight half days (during the months of October – December 2010) where I will observe and take field notes for the purpose of data collection. I will be as unobtrusive as I can in your space. You would also be interviewed twice by me for approximately one hour in length; once prior to my observations and once at the completion of my data gathering phase. The interviews will take place in a mutually agreed upon location and time outside of work hours *(interview questions are appended).* You may decline to answer any of the questions if you so wish. Furthermore, you may decide to withdraw from the study at any time and without penalty by advising the researcher. With your permission, the interviews will be audio-recorded to facilitate the collection of accurate information, and later transcribed for analysis. All information provided is considered confidential. Your name or any other personal information identifying you will not be used in the thesis paper resulting from this study, or in any presentation that I may give at the completion of my thesis. However, with your permission quotations may be used along with pseudonyms to protect your identity. Transcriptions and/or tapes collected during the study will be retained until my research is completed and defended, in

a locked box in my home office then shredded or erased. Only my advisor and I will have access to the data.

There are no risks to you as a participant in this study, but you may benefit from the professional dialogue and reading the final results of my research which I will make available to you. There will be no compensation for participating in this study.

If you have any questions regarding this course project, or would like any additional information to assist you in reaching a decision about participation, please contact me by email at awells18@shaw.ca or at 204-253-0772. You can also contact my faculty advisor, Dr. Charlotte Enns at 204-474-9017.

Your signature on this form indicates that you have understood to your satisfaction the information regarding participation in the research and agree to participate as a participant. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time and/or refrain from answering questions you prefer to omit, without prejudice of consequence. Your continued participation should be as inform as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

This research has been approved by the Education Nursing Research Ethics Board. If you have any concerns or complaints about this project you may contact any of the above-named persons or the Human Ethics Secretariat at 204-474-7122. A copy of this consent form has been given to you to keep for your records and reference.

I look forward to speaking with you or reading your responses and I thank you in advance for your assistance in this project.

I am agreeing to: (please check the ones that are applicable to you).

_____ allow the researcher (Alison Wells) access to my classroom for five – eight visits during the months of October – December 2010.

_____ be interviewed twice for one hour.

_____ allow my comments to be used in the reporting of the data collected.

I would like a summary of the results yes/no. Results to be sent to the following address

_____

Participant's Name (please print)

_____

Participant's Signature   Date

Researcher's Signature   Date

Letter of Informed Consent

Learning Support Teachers

UNIVERSITY
OF MANITOBA

Title of Thesis Study: An Investigation of Inquiry-Based Learning in Inclusive Classrooms.

Student Researcher: Alison Wells

This consent form, a copy of which will be left with you for your records and reference, is only part of the process of informed consent. It should give you the basic ideas of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

I am a learning support teacher in XXXXX School Division as well as a Master's student at the University of Manitoba. I am currently working on my thesis and am in the data gathering stage. I am conducting research for my thesis in order to complete a Master's in Inclusive Special Education through the faculty of Education, University of Manitoba. My faculty advisor is Dr. Charlotte Enns. I would like to provide you with more information about my research and what your involvement would entail if you decide you would like to take part. The purpose of this research is to investigate how educators define and implement inquiry-based learning in inclusive classroom settings in elementary schools in urban Winnipeg. I would like to provide you with more information about my research and what your involvement would entail if you decide you would like to take part.

Participation in this research is voluntary. It will involve allowing me to interview you for approximately one hour in length; once prior to my observations and once at the completion of my data gathering phase. The interview will take place in a mutually agreed upon location and time outside of work hours *(interview questions were appended to the recruitment letter you already signed).* You may decline to answer any of the questions if you so wish. Furthermore, you may decide to withdraw from the study at any time and without penalty by advising the researcher. With your permission, the interviews will be audio-recorded to facilitate the collection of accurate information, and later transcribed for analysis. All information provided is considered confidential. Your name or any other personal information identifying you will not be used in the thesis paper resulting from this study, or in any presentation that I may give at the completion of my thesis. However, with your permission quotations may be used along with pseudonyms to protect your identity. Transcriptions and/or tapes collected during the study will be retained until my research is completed and defended, in a locked box in my home office then shredded or erased. Only my advisor and I will have access to the data.

There are no risks to you as a participant in this study, but you may benefit from the professional dialogue and reading the final results of my research which I will make available to you. There will be no compensation for participating in this study.

If you have any questions regarding this course project, or would like any additional information to assist you in reaching a decision about participation, please contact me by email at awells18@shaw.ca or at 204-253-0772. You can also contact my faculty advisor, Dr. Charlotte Enns at 204-474-9017.

Your signature on this form indicates that you have understood to your satisfaction the information regarding participation in the research and agree to participate as a participant. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time and/or refrain from answering questions you prefer to omit, without prejudice of consequence. Your continued participation should be as inform as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

This research has been approved by the Education Nursing Research Ethics Board. If you have any concerns or complaints about this project you may contact any of the above-named persons or the Human Ethics Secretariat at 204-474-7122. A copy of this consent form has been given to you to keep for your records and reference.

I look forward to speaking with you or reading your responses and I thank you in advance for your assistance in this project.

I am agreeing to: (please check the ones that are applicable to you).

_____   be interviewed for one hour.

_____   allow my comments to be used in the reporting of the data collected.

I would like a summary of the results yes/no. Results to be sent to the following address

_____

Participant's Name (please print)

_____

Participant's Signature   Date

_____

Researcher's Signature   Date

Letter of Informed Consent - Parents

UNIVERSITY
OF MANITOBA

Title of Thesis Study: An Investigation of Inquiry-Based Learning in Inclusive Classrooms.

Researcher: Alison Wells

This consent form, a copy of which will be left with you for your records and reference, is only part of the process of informed consent. It should give you the basic ideas of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or not included here, you should feel free to ask. Please take the time to read this carefully and to understand any accompanying information.

I am a learning support teacher in XXXX School Division as well as a Master's student at the University of Manitoba. I am currently working on my thesis and am in the data gathering stage. I am conducting research for my thesis in order to complete a Master's in Inclusive Special Education through the faculty of Education, University of Manitoba. My faculty advisor is Dr. Charlotte Enns. I would like to provide you with more information about my research and what your involvement would entail if you decide you would like to take part. The purpose of this research is to investigate how educators define and implement inquiry-based learning in inclusive classroom settings in elementary schools in urban Winnipeg. I would like to provide you with more information about my research and what your involvement would entail if you decide you would like to take part.

Participation in this research is voluntary. It will involve allowing me to interview you for approximately one hour in length. The interview will take place in a mutually agreed upon location and time outside of work hours *(interview questions were appended to the recruitment letter you already signed).* You may decline to answer any of the questions if you so wish. Furthermore, you may decide to withdraw from the study at any time and without penalty by advising the researcher. With your permission, the interview will be audio-recorded to facilitate the collection of accurate information, and later transcribed for analysis. All information provided is considered confidential. Your name or any other personal information identifying you will not be used in the thesis paper resulting from this study, or in any presentation that I may give at the completion of my thesis. However, with your permission quotations may be used along with pseudonyms to protect your identity. Transcriptions and/or tapes collected during the study will be retained until my research is

completed and defended, in a locked box in my home office then shredded or erased. Only my advisor and I will have access to the data.

There are no risks to you as a participant in this study, but you may benefit from the professional dialogue and reading the final results of my research which I will make available to you. There will be no compensation for participating in this study.

If you have any questions regarding this course project, or would like any additional information to assist you in reaching a decision about participation, please contact me by email at awells18@shaw.ca or at 204-253-0772. You can also contact my faculty advisor, Dr. Charlotte Enns at 204-474-9017.

Your signature on this form indicates that you have understood to your satisfaction the information regarding participation in the research and agree to participate as a participant. In no way does this waive your legal rights nor release the researchers, sponsors, or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time and/or refrain from answering questions you prefer to omit, without prejudice of consequence. Your continued participation should be as inform as your initial consent, so you should feel free to ask for clarification or new information throughout your participation.

This research has been approved by the Education Nursing Research Ethics Board. If you have any concerns or complaints about this project you may contact any of the above-named persons or the Human Ethics Secretariat at 204-474-7122. A copy of this consent form has been given to you to keep for your records and reference.

I look forward to speaking with you or reading your responses and I thank you in advance for your assistance in this project.

I am agreeing to: (please check the ones that are applicable to you).

_____ be interviewed for one hour.

_____ allow my comments to be used in the reporting of the data collected.

I would like a summary of the results yes/no. Results to be sent to the following address
_____

Participant's Name (please print)

_____
Participant's Signature   Date

_____
Researcher's Signature   Date

Appendix F

Interview Protocol

Classroom Teachers

Interview # 1 – Pre-observation classroom teachers

Pseudonym:_____

Date:_____

Start Time:_____   End Time:_____

Duration:_____

Opening comments: As you might recall I am talking with you today about your experiences with inquiry-based learning in the elementary classroom. I will be taping our conversation so that I can transcribe and analyze the comments at a later time. I will also be taking notes as we talk. Are you ready to begin?

Interview questions

- How many years have you been an educator?
- What beliefs or values are central to your own philosophy of teaching and learning
- How many years have you used an inquiry-based approach in your classroom?
- How would you define inquiry-based learning? What does that mean for you?
- What role do you play in the classroom?
- What role do your students play?
- What interactions do you see taking place?
- How do you implement IBL in your classroom?
- What type of constructivism do you follow? What issues does this present for you?
- How do you think IBL relates to differentiated instruction? Share some examples of what you mean?
- What role does technology play in DI in your classroom?
- How often do the children determine the inquiry topic and how often do you?
- How do you incorporate the Manitoba curriculum?
- What influenced your decision to use IBL in your classroom?
- Tell me about some of your experiences both positive and negative using IBL?
- Do you consider IBL inclusive? How?
- How do you include students with exceptionalities in IBL in your classroom?

- Do you collaborate and or co-teach with the librarian, learning support teacher or anyone else?
- What does your weekly schedule look like? Could I have a copy of it?
- Do you have artifacts you would be willing to share that will help me in my research?

Interview # 2 – Post observation classroom teachers

PLEASE NOTE: some of the post observation questions will be developed as I progress through my term in the classroom. As things emerge I will add to this list of questions.

Pseudonym:_____

Date:_____

Start Time:_____   End Time:_____

Duration:_____

Opening comments: As you might recall I am talking with you today about your experiences with inquiry-based learning in the elementary classroom. I will be taping our conversation so that I can transcribe and analyze the comments at a later time. I will also be taking notes as we talk. Are you ready to begin?

Interview questions

- How do you decide to bring an inquiry to an end?
- How do you do assessments in preparation for report cards?
- How do you conduct your parent/teacher conferences?
- What has been successful this term in regards to the inquiry that the students have participated in?
- What would you have changed? Why?
- How often did you collaborate with the learning support teacher and librarian this term?
- Do you have any artifacts that might help demonstrate something we have talked about or I observed?

Interview Protocol Learning Support Teachers

Pseudonym:_____

Date:_____

Start Time:_____   End Time:_____

Duration:_____

Opening comments: As you might recall I am talking with you today about your experiences with inquiry-based learning in the elementary classroom. I will be taping our conversation so that I can transcribe and analyze the comments at a later time. I will also be taking notes as we talk. Are you ready to begin?

Interview Questions

- How many years have you been an educator?
- What beliefs or values are central to your own philosophy of teaching and learning?
- Can you describe your role as a learning support teacher?
- Do you see your role change depending on which class you are supporting? How so?
- Do all the classes in the school use and IBL approach?
- How would you define IBL?
- Which paradigm do you think IBL belongs to?
- Would you consider IBL a method of DI? Why or why not? Do you have some examples you can share?
- Does your role change in the IBL classrooms?
- Do you consider IBL inclusive? How?
- What role does technology play in DI in the classroom?
- How do you collaborate or co-teach with the classroom teacher?

Interview Protocol Parents

Pseudonym:_____

Date:_____

Start Time:_____   End Time:_____

Duration:_____

Opening comments: As you might recall I am talking with you today about your experiences with inquiry-based learning in the elementary classroom. I will be taping our conversation so that I can transcribe and analyze the comments at a later time. I will also be taking notes as we talk. Are you ready to begin?

Interview Questions

- What is important to you as a parent about your child's education?
- How would you define inquiry-based learning?
- Has your child always been in an inquiry-based classroom?
- Have you had or do you have other children in a similar classroom setting?
- Was it your choice to have your child XXXX in the classroom they are in now?
- Do you see benefits to them being in and IBL classroom? Disadvantages?
- Do you feel that your child's needs are being met?
- Do your child's IEP goals reflect the learning environment they are in?
- Do you understand the assessment process used by the classroom teacher?
- How would you define the role of the teacher in and IBL classroom?
- How would you define the role of the student in and IBL classroom?