The Implementation of Knowledge Building in the Elementary Classroom

By

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Abstract

Knowledge Building is an approach to teaching and learning that places students’ ideas, questions, and observations at the centre of the learning experience. This qualitative research study explored the question: what are elementary teachers’ experiences with implementing Knowledge Building in the elementary classroom? Data was collected through semi-structured interviews with two Ontario Certified Teachers working in the Greater Toronto Area who use Knowledge Building in their classrooms. Data analysis yielded four main themes: the importance of creating a safe and inclusive classroom community, from theory to practice; approaches teachers take when using Knowledge Building; that KB classrooms reportedly lead to greater student engagement; and teachers as learners, or the need for professional development and resources. Implications for personal practice and the education community were discussed, such as empowering students to be responsible for their own learning and for teachers to be more than facilitators but to provoke thinking in students. As well, recommendations for further professional development on Knowledge Building for pre-service teachers and teachers were made, such as workshops and training, a mentorship program with other teachers, and opportunities in teacher education programs to learn about and see KB in action.

**Keywords:** Knowledge Building, inquiry-based learning, student inquiry, teacher practice, 21st century learning
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# Table of Contents

Abstract ii

Acknowledgements iii

Chapter 1: Introduction 1

1.0 Introduction to Research Context and Problem 1

1.1 Purpose of Study 10

1.2 Research Questions 10

1.3 Background of Researcher 11

1.4 Overview 11

Chapter 2: Literature Review 13

2.0 Introduction 13

2.1 Definition of Knowledge Building 13

2.1.1 Principles of Knowledge Building pedagogy 15

2.2 Knowledge Forum and Technology 16

2.3 Creating Knowledge Through Thinking and Discourse 17

2.4 Implementation in the Classroom 19

2.4.1 The role of the teacher 21

2.4.2 Diverse learners 23

2.4.3 Challenges with implementing Knowledge Building 24

2.5 Conclusion 25

Chapter 3: Research Methodology 26

3.0 Introduction 26

3.1 Research Approach and Procedures 26
5.2.1 Broad implications: The educational community 50

5.2.2 Narrow implications: Professional identity and practice 54

5.3 Recommendations 55

5.4 Areas of Further Research 57

5.5 Concluding Comments 58

References 59

Appendix A: Letter of Signed Consent 66

Appendix B: Interview Protocol 68
Chapter 1: Introduction

1.0 Introduction - Research Context and Problem

The 21st century has brought about many changes in our society. The skills demanded for many jobs are much more complex and diverse than they once were. Today “work environments are technology-rich, problems are frequently ill-defined and people work in teams, often multidisciplinary teams, to deal with them” (Griffin & Care, 2015, p. 1). The development of 21st century skills with a focus on collaboration, creativity, communication, and critical thinking are crucial skills for young people entering the ever-changing labour market and “requires people to work towards higher order thinking and problem-solving” (p. 9). Traditional teaching methods are no longer meeting the needs of learners, who need to be proficient, flexible and analytical in the higher order thinking skills. In order to do this effectively, teaching and learning in the classroom has to support creativity, collaboration, communication and critical thinking. In a study done by Pianta and Belsky (cited in Harvey & Daniels, 2009), 91 percent of American fifth graders’ school day was spent working alone or listening to a teacher talk. In a system like this, teaching is for the test and the test can become the curriculum (Harvey & Daniels, 2009). The acquisition of these skills begins for students in K-12 schools, and education system faces the challenge of developing these skills in all students to prepare them for participation in the information and knowledge society. An inquiry-based learning approach seeks to develop in students the aforementioned skills, through their time in school and continue with them on their life-long learning journey. Inquiry is an overall educational mindset that fosters a “culture of collaborative learning and idea improvement” (Chiarotto, 2011, p. 7).

Inquiry-based learning is not a new approach to teaching, as it has been in practice for over 30 years in classrooms (Kuhlthau et al., 2007; Lucas et al., 2005). The intention behind
inquiry-based learning is that the students are involved in experiential learning rather than just completing worksheets that the teacher has given them to complete (Harvey & Daniels, 2009). Inquiry has also been defined as an approach to learning whereby students find and use a variety of sources of information and ideas to increase their understanding of a problem, topic or issue of importance (Kuhlthau et al., 2007). It requires more than simply answering questions or getting a right answer. Although there are many different examples of process or cycles of inquiry, inquiry often follows the scientific inquiry process: selecting a topic, researching or investigating, analyzing the information and then some form of conclusion (Lucas et al., 2005). “It espouses investigation, explorations, search, quest, research, pursuit and study. It is enhanced by involvement with a community of learners each learning from the other in social interaction” (Kuhlthau et al., 2007, p. 2).

In inquiry-based learning, students’ questions and ideas are placed at the centre of the learning experience, rather than those of the teacher. Teachers using an inquiry process, encourage students to ask and genuinely investigate their own questions about the world. Teachers further facilitate students’ learning by providing a variety of tools, resources, and experiences that enable learners to investigate, reflect, and rigorously discuss potential solutions to their own questions about a topic the class is studying. (Chiarotto, 2011, p. 7)

The skills that students can develop in an inquiry-based classroom can apply to across all content and grade levels, as well as further into their future. This has been recognized by the province of Ontario, and there are a number of Ontario Ministry of Education documents such as Learning for All (2013b) and from the Capacity Building Series; Getting Started with Student Inquiry
(2011) and *Inquiry-Based Learning* (2013a) that infuse student inquiry throughout and have them as expected practices in classrooms.

A teaching approach that successfully builds on inquiry-based learning is Knowledge Building (KB). Knowledge Building is a “theoretical, pedagogical, and technical innovation that focuses on the 21st century need to work creatively with knowledge” (Chiarotto, 2011, p. 1). At the core of both inquiry-based learning and Knowledge Building is student curiosity. Children are often described as being naturally curious and having many questions about the world, and it is through these wonderings that they learn best. Knowledge Building provides students with the opportunity for their natural curiosity to be nurtured and used to benefit their own learning. Knowledge Building involves creating a classroom environment that is based on authentic learning, which allows students to focus on complex and real-world problems (Lombardi, 2007). Students find solutions through problem-based activities and meaningful tasks that allow them to be creative and problem-solve as opposed to listening to an adult for information and the memorization of facts (Chiarotto, 2011). This approach moves away from teaching to a test and towards having students acquire the skills they will need when they leave school and go out into the world. Students in an inquiry-based environment “are engaged, activated, and motivated” (Harvey & Daniels, 2009, p. 6). They are encouraged to take on the role of researchers, much like adults, designing, investigating and taking ownership of their learning and then sharing their findings with the classroom community. Harvey and Daniels argue that “these kids are thinking. They are employing the very same cognitive strategies that proficient grown-up readers, writers, researchers, and collaborators use to get work done in the world every day. And these students are thinking together” (p. 6).
Currently in some classrooms, what makes inquiry-based learning different from Knowledge Building is that the inquiry begins with questions that are formed by the students as opposed to topics that teachers have selected. Even young students are able to develop ‘big ideas’ and questions. This is an approach to teaching and learning that places students’ questions, ideas and observations at the centre of the learning experience (Resendes et al., 2015). This is the difference that Scardamalia and Bereiter, the creators of Knowledge Building theory, argue in their work; that is, knowledge creating is different than knowledge transmission (Scardamalia & Bereiter, 2006). When involved in this type of learning, students are better able to take other points of view and to make connections.

There is a progression in two Ontario Ministry of Education Monographs on Student Inquiry. The first, *Getting Started with Student Inquiry* (2011) and two years later an update was published *Inquiry-based Learning* in 2013. The second monograph has embedded the Knowledge Building principles throughout the document. This does not appear to be a coincidence as Scardamalia (2002, 2004; Scardamalia & Bereiter, 1987, 1991, 1994, 2003, 2006, 2008, 2014), an originator of Knowledge Building cited repeatedly throughout this MTRP, is quoted throughout the monograph. It seems that Knowledge Building builds on inquiry-based learning. A classroom can be immersed in inquiry-based learning and not be a Knowledge Building classroom, but a Knowledge Building classroom is rooted in inquiry-based learning and seems to go much deeper. This seems to be a result of the Knowledge Building principles being purposefully embedded in this pedagogical approach.

Since Knowledge Building is an approach to teaching and learning that places students' questions, ideas and observations at the centre of the learning experience. Educators play an active role throughout the process by establishing a culture where ideas are respectfully
challenged, tested, redefined and viewed as improbable, moving children from a position of
wondering to a position of enacted understanding and further questioning (Scardamalia, 2002).
Underlying this approach is that both educators and students share responsibility for learning.
When involved in this type of learning, students are better able to take other points of view and to make connections. In doing so, their literacy skills are strengthened as they are involved in purposeful and authentic ways: they learn to write appropriate questions, they gather information.

At the core of Knowledge Building is thinking and questioning. As well as, an underlying assumption that students – even young children – are capable beings, who can be responsible for their own learning and that this authentic work can take place in classrooms. It becomes work that can actually advance knowledge and not just copy it (Scardamalia & Bereiter, 2006). Scardamalia used the example of 20th century philosopher Bertrand Russell to explain this belief:

When you want to teach children to think, you begin by treating them seriously when they are little, giving them responsibilities, talking to them candidly, providing privacy and solitude for them, and making them readers and thinkers of significant thoughts from the beginning. That’s if you want them to think. (Scardamalia & Bereiter, 2014, p. 3)

Scardamalia and Bereiter’s (2006) early work seems to have been influenced by Bertrand Russell who believed “teach them to think” as a matter of enculturation. As with Knowledge Building, there is no mention of individual skills teaching here. It is not basic rote skills, but rather critical thinking skills that are grounded in knowledge, including: the ability to form an opinion for oneself, the ability to find an impartial solution, and the ability to identify and question assumptions (Hare, 2001), and all is driven by questions, as it is with KB. Bertrand Russell (as
cited in Hare, 2001) goes on to defend that “thinking is not driven by answers but by questions” (p. 9). Students who have questions are really thinking and learning. This philosophy of thinking is inherent in the Knowledge Building Principles; that is, not only are the students developing their Knowledge Building competencies but they are seeing themselves and their work as advancing ideas and knowledge (Scardamalia & Bereiter, 2006).

Knowledge Building pedagogy is based on the premise that authentic creative knowledge work can take place in classrooms. “The work does not only imitate the work of scholars or scientists but that it advances the knowledge in the classroom community and in doing so, places it within the larger community of knowledge” (Scardamalia & Bereiter, 2006, p. 101). This was very different than the mainstream education of the time. The following are the 12 Principles of Knowledge Building, which are important to note because they are the foundation of the pedagogy (Scardamalia & Bereiter, 2006):

1. **Real ideas and authentic problems.** In the classroom as a Knowledge building community, learners are concerned with understanding, based on their real problems in the real world. They identify problems that arise from efforts to improve practice and understand the world.

2. **Improvable ideas.** Students’ ideas are regarded as improvable rather than simply accepted or rejected. Not searching for the answer or final state but on the best explanation.

3. **Idea diversity:** Knowledge advancement depends on diversity of ideas, just as the success of an ecosystem depends on biodiversity. To understand an idea is to understand the ideas that surround it, including those that stand in contrast it.

4. **Rise above.** Through a sustained improvement of ideas and understanding, students create higher level concepts.
5. **Epistemic agency.** Learners set goals, engage in long-range planning, monitor progress, evaluate idea coherence, support sustained knowledge advancement. Learners are empowered to take charge at the highest levels.

6. **Community knowledge, collective responsibility.** Students' contribution to improving their collective knowledge in the classroom is the primary purpose of the KB classroom, not just their individual learning.

7. **Democratizing knowledge.** All individuals are invited to contribute to the knowledge advancement in the classroom. Everyone’s ideas are needed and encouraged. Diversity is seen as a strength.

8. **Symmetric knowledge advancement.** Expertise is distributed within and between communities and team members.

9. **Pervasive Knowledge Building.** Knowledge Building is not confined to particular occasions or subjects but pervades, in and out of school. Everywhere is an opportunity.

10. **Constructive uses of authoritative sources.** Find and critically evaluate source material; assess writer credentials; use source material to refine ideas, not as ultimate authority; show respect for expertise, but also freedom to question authoritative accounts.

11. **Knowledge building discourse.** Students are engaged in discourse to share with each other, and to improve the knowledge advancement in the classroom. Discursive practices are not simply for sharing ideas and opinions, but for transforming and advancing knowledge.

12. **Concurrent, embedded, and transformative assessment.** Assessment is integral to Knowledge Building and helps to advance knowledge through identifying advances, problems, and gaps as work proceeds.
In her 2002 article, Scardamalia summarized the 12 Principles as conditions that are needed to support Knowledge Building: first, people must work on knowledge problems that arise from attempts to understand the world; second, they must work with the goal of improving coherence and quality of ideas; third, participants must negotiate a fit between their own ideas and those of others and use the differences they find to advance knowledge; fourth, there must be collective responsibility for advancing community understanding and all participants contribute; and fifth, participants must take a critical stance as they use various information sources. Finally, there must be knowledge-building discourse, which is more than knowledge sharing.

When involved in this type of learning, students are better able to take other points of view and to make connections. In doing so, their literacy skills are strengthened as they are involved in purposeful and authentic ways: they learn to write appropriate questions, they gather information from a variety of texts and observations, they communicate their results and findings and they reflect on the process (Adolescent Literacy Learning, 2015). In doing so, Knowledge Building can be embedded in the Ontario Curriculum, as it is aligned with the current trends in education.

To support Knowledge Building work in the classrooms, Scardamalia and Bereiter, in 1983, developed an early version of Knowledge Forum, a sophisticated online community space that promoted the 12 Principles of Knowledge Building. This online environment embedded the ideas that were shared in the school community. Knowledge Forum was not just a tool but a Knowledge Building environment; that is, a virtual space within which the main work of a Knowledge Building group would take place. The main components of the Knowledge Forum database are “notes” and “views”. A view is an organizing background for notes. It may be a concept map, a diagram, a scene: anything that visually adds structure and meaning to the notes.
In the 1980’s when most people were developing programs as artificial intelligence, expert systems and instructional management systems, Scardamalia and Bereiter took a different approach and focused on "students as epistemically agents" in their learning (2014b, p. 1). They purposely chose not to follow the mainstream idea of having a "highly intelligent tutoring" system that could guide the learning, but developed a program that would "provide the facilitating structure and tools that enable students to make maximum use of their own intelligence and knowledge" (Scardamalia and Bereiter, 1987, p. 54). The technology that was first developed focused on supporting intentional learning in a networked social environment, but they soon realized that students were doing more than helping each other learn, they were creating knowledge. Thus, Knowledge Forum was not just a tool but a knowledge building environment; that is, a virtual space within which the main work of a KB group would take place (Barber et al., 2014).

In sum, traditional teaching methodologies do not prepare students for the working world of today. George Couros (2015) writes on how he believes that when students graduate many of them feel that the only thing they are good at is school, and that we teach kids compliance. Students “have mastered rubrics, they know how to ace tests, and they have figured out how to work within specific parameters” (p. 20). But we have to be reminded that this is not how the world works. To succeed students “need to know how to think for themselves and adapt to constantly changing situations” (p. 20). Children come into schools filled with wonder and questions and teachers should strive to take hold of that curiosity and “empower students to learn on their own. To wonder. To explore. To become leaders” (p. 19). Using Knowledge Building as
a teaching approach allows all students to learn through their curiosity and develop the skills they need to be successful in our global community.

1.1 Purpose of Study

The purpose of this study was to explore the experiences of Ontario elementary teachers who have implemented and are currently using Knowledge Building strategies and pedagogy in their classrooms. This study looked at whether they believe it has been successful with their classes and their relationship with this approach to teaching. In order to study this topic, I interviewed a sample of these teachers about how they have created a classroom environment that uses Knowledge Building, what challenges they have faced when implementing this strategy, how they believe it fits into the curriculum expectations, what assessment strategies they use with Knowledge Building, and whether they believe that it is a successful approach to use with students. I hope that this study provided insight to incoming teachers and to the greater educational community about implementing Knowledge Building in their classrooms.

1.2 Research Questions

The central research question guiding the research study was: what are Ontario elementary teachers’ experiences of implementing Knowledge Building in the classroom? Sub-questions that further guided this study included:

- How do these teachers reportedly create a Knowledge Building classroom?
- What training or professional development have they experienced or found useful in their relation to their use of KB?
- How do these teachers assess student learning with Knowledge Building?
- What barriers and supports do teachers encounter in using a KB approach?
1.3 Background of the Researcher

My name is Cassandra Reda Gavin and I am a candidate for a Masters of Teaching degree from the Ontario Institute of Studies in Education. I plan to enter field of Education and aspire to teach in the junior and intermediate divisions. I am a white, Euro-Canadian female who received an Ontario education in the Peel region from a number of elementary schools and a prestigious Arts high school. As a student, I was more engaged in my own learning, when the topic was interesting to me. I enjoyed learning new things, but often felt like I was not really learning at school when I had teachers who used a lot of worksheets, textbook readings, or just had us copy notes. Even in these environments I still did well in school. I was most engaged in my work when the tasks I were given were meaningful to me.

Throughout my teacher education certain ideals have stuck with me, and as I study to become a teacher and encounter diverse approaches to working with and supporting learners of varying strengths and abilities, my personal teaching practice has been influenced. I have increasingly become interested in student-centered learning and was interested in researching Knowledge Building specifically because it begins inquiry-based learning and adds a community emphasis. Here, knowledge is not just for the individual but is shared with the classroom community; this is a skill that I think is beneficial to learn at young age. Knowledge Building seems like an exciting way to teach and learn, and something I am interested in knowing more about as I develop my own teaching pedagogy.

1.4 Overview

To respond to the research questions, I conducted a qualitative research study using purposeful sampling to interview two elementary teachers who have implemented Knowledge Building in the elementary classroom. This MTRP is organized into five chapters. In Chapter
Two, I review the literature in the areas of Knowledge Building. Chapter Three describes the research methodology and includes information about the participants, data collection, study strengths and limitations. In Chapter Four, I will report and discuss my research findings. Finally, in Chapter Five I review the implications of the research findings for the education community and my own future practice, and make recommendations for further investigation and research.
Chapter 2: Literature Review

2.0 Introduction

This chapter contains a review of literature on the topic of Knowledge Building. The chapter begins with a brief definition of KB, highlighting the importance of the 12 Principles to the pedagogy. It follows with a look at the use of Knowledge Forum and a look at the importance of thinking and discourse to Knowledge Building. Finally, the chapter concludes with an examination of the literature on the implementation in the classroom focusing on the role of the teacher, diverse learners, and challenges with implementation.

2.1 Definition of Knowledge Building

Dr. Marlene Scardamalia and Dr. Carl Bereiter, both researchers from the Ontario Institute for Studies in Education, developed the theory of Knowledge Building through thirty years of research and study (Scardamalia & Bereiter, 2014). Scardamalia and Bereiter’s (2002) early research in the 1980’s found that there was an absence of ‘collective cognitive responsibility’ in schools that was evident in the workplace, including medical teams, business and sport teams (p. 67). Scardamalia (2002) described collective cognitive responsibility as “the condition in which responsibility for the success of a group effort is distributed across all members rather than being concentrated on the leader and they take responsibility for understanding what is happening” (p. 68). In applying this to current trends in education, this would refer to 21st century learning: collaboration, higher order thinking, problem-solving, communication, and creativity (Barber et al., 2014; Lin et al., 2014). These are the skills that are now needed to be competent in a knowledge-based society, as described in Chapter One. Students need to know how to apply knowledge instead of just knowing facts (Silver, 2008). A study by Lin et al. (2013) found that “to effect the changes, it is necessary to create new
perspectives to cultivate students’ abilities to cope with the rapidly changing world in the 21st century” (p. 124).

Knowledge Building focuses on improving the ideas of the entire classroom community instead of the individual learner (Scardamalia & Bereiter, 1991, 1994, 2006). Researchers So, Seah and Toh-Heng (2009) investigated whether young learners new to Knowledge Building could work at advancing individual knowledge, as well as for the group. Their findings indicate that there was academic achievement which show improvement of student understanding as a result of reflective and continuous work on inquiry. Also their data indicates that the Knowledge Building environment was beneficial for both high-achieving and low-achieving students. Stehr (1994) has stated that this has much larger educational implications, as it affects society. Philip’s (2011) study described two factors that need to be addressed by knowledge-age societies: improving education and fostering innovation. In terms of innovation, Philip describes it as not “rare strokes of genius”, but rather sustaining a culture of innovation that regularly produces new knowledge (p. 119).

Zhang et al. (2007) examined the socio-cognitive dynamics of knowledge building activities for grade 4 students. Using inquiry threads as a tool, the researchers found that the young learners were able to generate explanation-seeking questions and ideas for building community knowledge. There have been a number of studies on Knowledge Building approaches addressing collaborative learning across different school grades (Caswell & Bielaczyc, 2001; van Aalst, 2009; Yoon, 2008). While the number of studies examining the impact of Knowledge Building for young learners is small, findings thus far are positive. The research is consistent in its findings that Knowledge Building creates classrooms where all ideas are respected and improved using innovative practices.
2.1.1 Principles of Knowledge Building pedagogy

The 12 Knowledge Building Principles support the transformation of the classroom into a KB community. Scardamalia and Bereiter (2003) define Knowledge Building as a social process with a focus on the production and continual improvement of ideas of value to a community. Other researchers also discuss their findings in relation to the 12 Principles. Lin et al. (2014), claim that KB pedagogy offers a new focus that is on students’ “epistemic work on idea creation and ever evolving improvement in a learning environment” (p. 124). Students need opportunities to practice in taking ownership to create ideas that address problems, working with others to advance their ideas and knowledge. They also view these principles as supporting the “transformation of the classroom into a Knowledge Building community” (Lin et al., 2014, p. 125), and so it becomes a social process with a focus on producing and continuing improvement of ideas that are of value to a community. The shift has been from being able to remember information to being able to learn with understanding (So, Seah, & Toh-Heng, 2009). Moss and Beatty (2010) specifically addressed two of the principles: democratization of knowledge, as all students at all achievement levels participated, and epistemic agency, with students providing evidence and justifying their responses.

Elements of the 12 Principles of Knowledge Building not only guide research or education practices but are an integral part of our global community, as is evident in a quote from the G8 2006 summit, “new ideas are essential to the development of human capital and are key engines of economic growth, drivers of market productivity and sources of cohesion for all nations” (Goldman & Scardamalia, 2013, p. 255).
2.2 Knowledge Forum and Technology

As discussed in Chapter One, to support Knowledge Building work in classrooms, Scardamalia and Bereiter in 1983, developed an early version of Knowledge Forum, a sophisticated online community space that promoted the 12 Principles of Knowledge Building. This online environment embedded the ideas that were shared in the school community. Knowledge Forum was not just a tool but a knowledge building environment; that is, a virtual space within which the main work of a knowledge building group would take place. (Scardamalia & Bereiter, 2006).

Technology has changed the landscape of classrooms. The term “knowledge age” has been used to describe the era that we are in. People are expected to work with ideas and to continually make improvements (Barber et al., 2014). Scardamalia and Bereiter developed Knowledge Forum to make Knowledge Building more effective. “Knowledge Building pedagogy is fostered through the use of knowledge building technology that creates an environment favourable to the processes of expertise and innovation” (Scardamalia & Bereiter, 2014, p. 4). The research study by So et al. (2002), describe that students were able to improve on their ideas and understanding, as well as self-correct, as evident in their Knowledge Forum postings. Stahl (2000) comments that computer support should provide a workspace where ideas can be articulated, can come into interaction with other ideas from a variety of viewpoints, and can be further developed.

The whole process of Knowledge Building can be supported by Knowledge Forum (So et al., 2009). Students can generate, question, and connect ideas posted by themselves to other students in a threaded format. Their study using scaffolds, such as “My theory”, “I need to understand” or “A better theory is”, helped students develop notes. As well, being able to check
participating, contribution and social interaction, can then be used as formative assessment to monitor the process.

Moss and Beatty (2010) developed a study for grade 4 students from different schools using Knowledge Forum for their work. The students were given algebra questions to solve and post on Knowledge Forum. The students had never met, and they were collaborating online. It was entirely student managed, there was no teacher voice, and no answers from any external source were given to the students. The students took the responsibility of the learning. Knowledge Forum provided an authentic context for collaborative problem solving and extended mathematical discussions. The students were able to see the solutions posted by their peers and were able to incorporate these ideas into their own solutions at a level that was meaningful to them. The following provides a student description of the study stating that:

it was good to use the computer because, like, if you have a theory and you place the theory on Knowledge Forum then people can read the theory and maybe they will know something about the rule or an idea and they can build onto your theory. Also you can even change your theory and you can agree and disagree with other people. (Moss and Beatty, 2010, p. 21)

With technology, rather than the teacher telling students information, the students were able to gather the information that they needed for their inquiry (Scardamalia, 2004).

2.3 Creating Knowledge Through Thinking and Discourse

A pillar of Knowledge Building is Knowledge Building Discourse, which is more than just sharing knowledge. The knowledge age has created a need for people to be able to work with ideas (Scardamalia, 2002). KB addresses this need by engaging students directly and productively in sustained work with ideas, with students assuming collective cognitive
responsibility for idea improvement (Scardamalia & Bereiter, 2003). The ideas of the group actually get refined and transformed through discourse over time (Tarchi et al., 2013). Students also listen to each other and build on ideas. Reeve et al. (2008) have also described this as Knowledge Building Talk or KB talk. This is whole group discussion in which students discuss whatever questions, insights and problems they have in relation to their Knowledge Building efforts, with the teacher providing support as needed to foster Knowledge Building discourse. Discourse is primarily a way of sharing knowledge (Haneda & Wells, 2000).

Resendes et al. (2015) recently explored the ability of grade 2 students to engage in metadiscourse; that is, talking about their new knowledge. The study was completed in Toronto, in a school were students are actively using Knowledge Building and Knowledge Forum. They were investigating the discourse in terms of both the actual talk that students engaged in with their teacher; as well as the discussions they had online using Knowledge Forum. They went on to develop two formative feedback visualization tools which grounded the Knowledge Building talk; as well, was only used with one sample group. The findings indicated significant results favouring the class that had the visual supports as scaffolds. Metadiscourse assumes that the actual discourse can be analyzed in itself. The researchers were looking at whether young children are capable of this and more importantly, what kind of supports do they need to be able to. Resendes et al. (2015) claims that in Knowledge Building, it is not enough that students incorporate new words into their talk and writing, but they need to include new word meanings into their thinking and their contributions to the collective Knowledge Building discourse. When given suitable supports, even young children can work creatively with knowledge.

In order to encourage KB Talk in the classroom, Jang and Reeve (2010) described a Knowledge Building Circle, which can be used when sharing new knowledge or for asking
questions and getting feedback from the group. For this, students sit in a circle, with the teacher as a member of the group contributing to the conversation and modeling careful listening. An important requirement for building group knowledge is having shared understanding, and the importance of social interaction (Stahl, 2000). Lin et al. (2014) found that a KB environment encourages learners to produce diverse ideas and develop, refine or elaborate the ideas through discourse. Their study was a result of a lack of relevant instruments to measure the creative extent of learning environments that foster students’ Knowledge Building or creating capacity. Using Knowledge Building pedagogy, they developed and validated the Knowledge Building environment scale (KBES) to measure students’ experiences of KB. They used KBES through three studies using separate samples, where Lin et al. found that it has practical implications for rethinking how to assess class teaching and learning.

Zhang et al. (2007) conducted a longitudinal study, where they followed nine teachers for 8 years as they used Knowledge Building. Their analysis of student discourse showed interactive contributions to a community knowledge space, understanding of content and collective responsibility for knowledge advancement. They also concluded that KB discourse tends to focus on enabling inclusive and open conversations in which everyone can express their theory without being judged or evaluated. Guided within the community to address authentic problems and to engage in action interactions, so that the ideas are transformed and improved for the whole community (Scardamalia & Bereiter, 2006).

2.4 Implementation in the Classroom

Many educators are implementing student inquiry-based learning successfully in their classrooms. Where Knowledge Building seems very exciting and rooted in good research (Moss & Beatty, 2010; Resendes et al., 2015; Zhang et al., 2007) the practice is fairly new in Ontario,
especially in the public school system. There is evidence of inquiry-based learning in many of the Ontario Ministry documents such as the Ontario Mathematics curriculum (2005), Ontario Language Arts (2006) curriculum, and the Ontario Social Studies and History curriculum (2013c). The pedagogy is beginning to be embedded in the policies however, it may take more time for it to be seen in successful practice. As stated in the Ontario Ministry of Education’s (2009) assessment and evaluation policy document *Growing Success*:

> Education directly influences students’ life chances – and life outcomes. Today’s global, knowledge-based economy makes the ongoing work in our schools critical to our students’ success in life and to Ontario’s economic future. As an agent of change and social cohesion, our education system supports and reflects the democratic values of fairness, equity, and respect for all. The schools we create today will shape the society that we and our children will share tomorrow. (p. 6)

The Ontario Language Arts Curriculum (2006) also very clearly states that “inquiry is at the heart of learning in all subject areas” (p. 29) placing great importance in this pedagogy. Metadiscourse is developed at a young age by developing their ability to ask questions, which then becomes more sophisticated as students enter older grades. The ability to locate, question, and validate information allows a student to become an independent, lifelong learner. As in Knowledge Building, the approach in Ontario Mathematics is collaborative and inclusive; it requires that students and teachers work together on achievement objectives, and that students take high-level responsibility for goals and outcomes — and especially for idea improvement. The Ontario Social Studies and History Curriculum (2013) has embedded inquiry-based learning throughout, stating that “it is important to be aware that inquiries will not always result in one ‘right answer’. Rather, to assess the effectiveness of their investigations, students must develop the ability to
reflect on their work throughout the inquiry process” (p. 23). The 2013 Ministry Capacity Building Series Monograph looks at inquiry based learning as transforming wonder into knowledge. Scardamalia’s work is cited throughout, When the classroom culture is one that views ideas as improvable, students work hard to continuously improve the quality, coherence and utility of ideas – both individually and collectively (Scardamalia, 2002).

Knowledge Building has learning as the work, as opposed to having students involved in a variety of activities that lead to learning. In the KB classroom, learners treat new knowledge or information as something problematic that needs to be explained (Bereiter & Scardamalia, 1993; Chan, Burtis & Bereiter, 1997). In the 2002 study by So, Seah and Toh-Heng, designing a culture of different classroom practice was investigated that would support Knowledge Building. They worked at building a culture where learners could interact with one another in a collaborative manner.

2.4.1 The role of the teacher

A teacher has an important role in student learning, “educators are charged with the great challenge and responsibility of engaging students in learning so that they develop the skills and knowledge they need to function in today’s world” (Ontario Ministry of Education, 2013a, p. 1). They develop a classroom environment that fosters respects for others ideas and opinions, along with encouraging risk taking that develops self-efficacy, by ensuring that students have the necessary knowledge, skills, strategies to work independently (Goldman et al., 2013; Spicer, 2011). “Educators play an active role throughout the process by establishing a culture where ideas are respectfully challenged, tested, redefined and viewed as improbable, moving children from a position of wondering to a position of enacted understanding and further questioning” (Scardamalia, 2002, p. 68).
Zhang et al.’s (2011) study stressed the importance of the teacher’s role in facilitating Knowledge Building processes by enabling collaboration and collective cognitive responsibility. This would be done by creating an “accepting, caring, and responsible community” that would work together to build and share knowledge (p. 296). Teachers who use inquiry-based learning know that they have to use a variety of strategies to help develop higher order thinking skills and that the questions they ask help the students build on their knowledge and lead to deeper thinking (Silver & Barrows, 2008). They further claim that questions are really important in KB. The type of question can either encourage more discussion and build on ideas, or it can stop knowledge building from happening. Resendes et al. (2015) claim that teachers empower students when using inquiry. That even young learners were able to generate questions and ideas for building community knowledge. In order for this to happen educators have a challenging task or re-designing the learning environment into a knowledge-centered community where learners work collaboratively toward the advancement of knowledge (Bereiter, 2002).

The biggest challenge is moving students beyond initial curiosity to a path of regular inquiry. It is essential for educators to have a deep knowledge and understanding of the ‘big ideas’ of the curriculum, as well as the expectations to ensure that the learning is happening in their classrooms (Sawyer, 2006). Studies have shown that there is a strong correlation between teacher beliefs and teacher practices (Beyer & Davis, 2008; Chen et al., 2009; Crawford, 2007). Change in teacher beliefs, the teachers will move away from tasks and activities to focus on the process of learning and moving knowledge towards innovation (Scardamalia & Bereiter, 2008).

Zhang et al. (2011) analysis of teacher and principal engagement showed a number of supportive conditions: shared vision, an understanding of the Knowledge Building principles, teacher professional opportunities and leadership that support innovation at all levels. In
particular, trust was very evident, among one another, but also trust in student ability to guide their own learning. In the classroom the teachers were able to work with emergent rather than fixed goals and they were able to take advantage of new opportunities rather than relying on fixed routines (Reeve, Messina & Scardamalia, 2008). It seems that in order for KB to work, the teacher has to be prepared to go in different directions and not always using the same routine over again, but using new opportunities.

2.4.2 Diverse learners

The following section focuses on how implementation of KB in the classroom could potentially benefit diverse learners. The study by So, Seah and Toh-Heng (2009) looked at whether Knowledge Building could be beneficial to both high-achieving and low-achieving students. The results show that the collaborative nature of KB was beneficial for all students, especially with those with diverse learning needs. In their study, the researchers designed an environment where learning was promoted through collaborative inquiry and where the focus went from “being able to remember information to be able to learn with understanding” (p. 480). They concluded that low-achieving students don’t know how to learn, inquire, collaborate or reflect. This is different than not having the ability for higher-order thinking. This finding is similar in many studies that have shown that inquiry-based curriculum and metacognitive tasks are beneficial for both low-achieving students and high-achieving students, and that the effect was actually greater for those students with diverse learning abilities (Chan & Lee, 2007; White & Frederiksen, 1998; Zohar & Dori, 2003); especially when scaffolds are put in place, then a knowledge building environment can be successful for all students. Scardamalia’s (2002) findings that as the diversity of ideas and democratizing knowledge are central for the collective
cognitive responsibility then students with diverse learning abilities are encouraged to participate in the knowledge building process to create many diverse ideas.

2.4.3 Challenges with implementing Knowledge Building

Although research has shown the potential for deep learning, there are still a number of challenges as to how teachers perceive Knowledge Building approaches. One of these is the belief that KB activities are only suitable for students who have higher cognitive abilities (Chan & Lee, 2007). This results in low-achieving student being deprived of this type of learning.

Scardamalia (2002) highlights some of the challenges with developing collective cognitive responsibility in schools. One being that students are responsible for using Knowledge Forum to create a valuable shared resource and just using the technology itself can pose a number of problems. There is also the issue of ensuring that ideas remain the focus of the work and the activities and mechanics don’t stand in the way of the goals that give meaning and purpose to the work. Scardamalia acknowledges the difficulty in not only understanding the pedagogy of Knowledge Building but of putting it in practice, “because of the slipperiness of words, the difference is difficult to convey, although teachers are very much aware of the difference once they have made the transitions” (p. 75).

An area of difficulty that arose from the Resendes et al. (2015) study is the suggestion that group formative feedback is more important than individual assessment. This would be difficult and potentially unrealistic in the public school system in Ontario, especially since parents are not given information as to how they individual child is being assessed.

Being mindful of the potential barriers, there is evidence that when a school-wide culture of Knowledge Building is established, the year-to-year problems of culture building diminish and
instead there is an upward progression where each year the culture advances beyond where it was before (Scardamalia, 2002).

2.5 Conclusion

Knowledge Building is part of a paradigm shift that is occurring in education. This chapter reviewed the literature on Knowledge Building by examining specific studies by a number of researchers. The research studies do indicate that Knowledge Building can take students natural curiosity and transform it into knowledge. Although the Knowledge Building pedagogy is beginning to be embedded in some of the Ministry curriculum documents and does seem to align with practices in Ontario, it is still a new teaching practice in the public school system. Although the research indicates success in the classrooms and schools currently using Knowledge Building practices, more research will be needed on the implementation in public schools. In the next chapter the research methodology for this study will be presented along with a description on the participants of the study.
Chapter 3: Research Methodology

3.0 Introduction

In this chapter I describe the research methodology, identify the methodological decisions I made, and my reasoning for these choices given the research purpose and questions. I begin with a review of the research approach, procedures, and a description of the instruments for data collection. I then identify the participants of the study, elaborating on sampling criteria and recruitment. I proceed to explain how the data has been analyzed, and review the ethical issues relevant to my study. Finally, I speak to the methodological limitations of the study, while also highlighting its strengths.

3.1 Research Approach & Procedures

This study was conducted using a qualitative research approach, and involved a review of existing literature relevant to the research questions and purpose of the study, and semi-structured, face-to-face interviews with two educators. The historical origin of qualitative research comes from the disciplines of anthropology, sociology, and the humanities (Creswell, 2014). Carr (1994) believes that qualitative research has had to overcome major obstacles in achieving recognition for its ongoing contribution to knowledge. Quantitative and qualitative methods serve different purposes and this, Carr (1994) argues, makes neither superior to the other. Silverman (2005) agrees with this stating that there are methods that are appropriate to one’s individual research, and no right or wrong methods.

There are a variety of definitions of qualitative research but at the core of this methodology is the expectation that there is a multitude of ways of making sense of the world (Jones, 1995). The qualitative researcher is most concerned with discovering the perspectives of those being researched and understanding their points of view rather than the researcher’s own
(Jones, 1995). Attempting to understand a phenomenon to then describe and apply findings to other highly similar contexts is where qualitative research differs from quantitative (Byrne, 2001). Quantitative research has more of a goal of “generalizing data extrapolated from the sample to the population at large” (Byrne, 2001, p. 494). Qualitative researchers are striving to provide a “deeper understanding of social phenomena” (Silverman, 2005, p. 112). Qualitative research tends to prioritize perception, meaning, and emotion, and tends to work with small samples (Silverman, 2005). Qualitative researchers are willing to “sacrifice scope for detail” (Silverman, 2005, p.9).

Qualitative research was a good approach for my study because my goal was to gain a deeper understanding on how Knowledge Building is implemented by teachers in the classroom by learning from their perspectives.

3.2 Instruments of Data Collection

Mason (1997) claimed that, in the qualitative research tradition, one of the most recognized forms of data collection is interviewing. Qualitative research does not try to create a contrived situation nor utilize survey instruments; rather it aims to gather up information through direct open-ended questioning (Creswell, 2013). These questions for data collection are used to attempt to understand the contexts or setting of a problem or issue (Creswell, 2013). For the purposes of this study the primary instrument for data collection was a semi-structured interview protocol.

Semi-structured interviews are generally scheduled in advanced and outside of everyday events (DiCicco-Bloom & Crabtree, 2006); for this study that meant outside of regular school hours. The interviews include a set of pre-determined questions but they were not fixed, and allowed the researcher to change the questions asked through the dialogue of the interview.
This allowed more meaningful data to be produced as additional questions that emerged may be closely connected with a participant’s interests or knowledge (DiCicco-Bloom & Crabtree, 2006), as well as “allow[ed] for more flexibility and responsiveness to emerging themes for both the interviewer and respondent” (Jackson II, Drummond & Camara, 2007, p. 25). Semi-structured interviews allow for the in-depth experiences of the research participants to be explored as well as the meanings make of these experiences (Adams, 2010). This particular instrument of data collection empowers individuals to share their stories and can minimize the power dynamic that can often exist between researchers and participants (Creswell, 2013).

As I was interested in how teachers implement Knowledge Building into the elementary classroom, the semi-structured interview protocol generated the most pertinent data. My purpose in these interviews was of course to learn more about the pedagogical strategy of KB, how it is being implemented by each interviewee and the perceived effectiveness of the strategy as implemented by this particular teacher. I conducted individual face-to-face interviews so that I could gain new insights from my participants’ perspectives (Adams, 2010). It was important to quickly establish a rapport with the interviewee by being an active listener who listens, asks for clarification, had follow up questions and generally demonstrates a high degree of interest in what the interviewee is saying. This encouraged the interviewee to “take on the role of guiding and teaching the interviewer” (DiCicco-Bloom & Crabtree, 2006, p. 317).

My interview protocol (located in Appendix B) was organized into five sections, beginning with the participant’s background information, followed by questions about their perspective/beliefs and teaching practices, and ending with questions regarding supports, challenges, and next steps for teachers. Examples of questions include:
- What do you believe students can gain from using Knowledge Building in the classroom?
- How have you introduced Knowledge Building in your classroom? What steps did you take to familiarize students with this practice?
- Have you faced any obstacles or challenges when implementing or using KB in your teaching?

3.3 Participants

This section details all the methodological decisions pertaining to my research participants. I begin with a review of the sampling criteria that have been established for participant recruitment, as well as a review of the approaches to teacher recruitment. A section is also included with an introduction to each of the participants.

3.3.1 Sampling criteria

The following criteria were applied to teacher participants:

1. Teachers are currently Knowledge Building into their classrooms.
2. Teachers have used Knowledge Building for at least one term.
3. Teachers will be working in the Greater Toronto Area.
4. Teachers will be working in an elementary or middle school.

In order to address the main research question, the participants that I interviewed will had to be implementing or have implemented Knowledge Building into their classrooms. Additionally, participants ideally would have been using KB for at least one term. This is because I was interested in how their class functions through this strategy and how participants approach assessment. To maintain divisional focus, I interviewed elementary/middle school teachers (Kindergarten to grade 8), who are employed within the Greater Toronto Area.
3.3.2 Sampling procedures

The selection of participants must have a clear rationale and in order to achieve a specific purpose that is related to the research question (Collingridge & Gantt, 2008 cited in Clearly, Horsfall & Hayter, 2014). By having a thoughtful selection of participants the researcher should find that they are able to generate focused and ‘rich’ data that contributes to a detailed account of the particular phenomenon (Curtis et al., 2000; Walsh & Downe, 2006 in Clearly et al., 2014). Recruiting a random sample can provide a circumstance in which information can be generalized to the population (Marshall, 1996). Marshall (1996) relates random sampling for qualitative research to be comparable to “randomly asking a passer-by how to repair a broken down car, rather than asking a garage mechanic” (p. 523). The ideal of qualitative research is not to generalize information but to elucidate specific particular information (Pinnega & Daynes, 2007 in Creswell, 2013). So random selection or sampling of participants was not be suitable for this study.

There are three broad approaches to selecting sampling for a qualitative study. They include convenience, purposeful, and theoretical sampling. Convenience sampling recruits the selection of the most accessible participants (Marshall, 1996). This approach to sampling saves time but is at the expense of data quality and credibility (Creswell, 2013; Marshall, 1996). The second approach, purposeful sampling, is the most common approach. With purposeful sampling the researcher actively seeks out the most appropriate participants to provide insight to the research questions (Marshall, 1996). The final approach is theoretical sampling. This approach involves forming interpretive theories from data that have emerged, and then gathering new samples to evaluate and expand on these theories (Marshall, 1996).

For this research study, I used a combination of both convenience and purposeful
sampling. Convenience sampling was employed through existing connections that I have made as a student, volunteer, and pre-service teacher in the Greater Toronto Area. I also made use of the snowball sampling method by asking for recommendations from existing contacts and participants (Marshall, 1996). To ensure that participants are volunteering to participate and feel under no obligation, I provided my information to be passed along rather than seek out these individuals (found through snowball sampling).

3.3.3 Participant bios

This section will provide a brief biography of the participants of this study.

Sasha is a Grade 6 elementary teacher in the Greater Toronto Area (GTA) and has been teaching for over ten years. She described her current school as being on the smaller scale with a population of approximately 250 K-8 students. Sasha described her school demographic as consisting of families of middle to low socio-economic statuses and of there being a cultural mix of students in the school. When asked how she was introduced to Knowledge Building, Sasha explained that she was introduced to it by her former Principal who wanted to implement inquiry-based approach in the school.

Catherine has almost ten years of elementary teaching in the GTA. This school year she has taken on a new role outside of the regular classroom as a Special Assignment Teacher (SAT) in her respective school board. Catherine described this role as a coach for teachers on areas of the curriculum, best practices, and current research. Catherine expressed her experience in using KB as both a classroom teacher and in her new role with other teachers. Much like Sasha, Catherine was introduced to KB through inquiry-based learning and her Principal wanting it brought into their school with the introduction of the new Social Studies curriculum.
3.4 Data Analysis

The analysis of data occurs concurrently with data collection during the qualitative research process. As data collection takes place, the researcher often will keep memos or ‘field notes’ during interviews, which helps to keep track of the evolving data and can be influential in the narrative of the final report (DiCicco-Bloom & Crabtree, 2006; Creswell, 2014). Qualitative data tends to be very rich and dense so not everything can be used in the study. During data analysis researchers may have to winnow the data by focusing on some and disregarding other parts of it (Guest, MacQueen, & Namey, 2012 in Creswell, 2014). During data analysis, researchers begin the process of coding the data. This process is what DiCicco-Bloom & Crabtree (2006) refer to as the template approach. With this approach, segments of text are organized with other segments of similar content that will represent a category (DiCicco-Bloom & Crabtree, 2006). According to Creswell (2014), codes usually fall under three categories. They are: what is expected to be found, data that was not anticipated and is surprising, and any unusual data that would be of interest to readers. From the categories created from codes, major themes become generated (Creswell, 2014; DiCicco-Bloom & Crabtree, 2006). Through the course of my analysis, I used this procedure. I transcribed interviews and coded the data as it pertained to my research purpose and questions. Furthermore, I distinguished and categorized major themes or discrepancies in my findings, while also recognized any null data that came forth in the research.

3.5 Ethical Review Procedures

Throughout my interviews with participants I considered the following ethical issues:

- Protecting the privacy and information of the interviewees.

- Ensuring that the interviewees are aware of the purpose of my research and findings will be disseminated.
• Ensuring that there is no exploitation of the interviewees.

All of the recordings and notes from each interview have been kept on a password protected laptop/cellphone/hard drive, and will be destroyed after five years. When referring to an interviewee I always used a pseudonym and removed any other information which could be used to identify them (DiCicco-Bloom & Crabtree, 2006). Their identity will remain confidential and participants were notified of their right to withdraw from the study at any point. I ensured that the interviewees are aware of the purpose of my research beforehand and explained it again prior to asking them questions. Before conducting my data analysis, participants had the opportunity to review interview transcripts and clarify or retract any statements, if they explicitly requested to. There was no exploitation of the interviewee’s thoughts or ideas, and participant ideas have been clearly distinguished from the researchers summary (DiCicco-Bloom & Crabtree, 2006). There is minimal risk in participating in this study but I will reiterate to them prior and throughout the interview that they may refrain from answering any question that they do not feel comfortable with. Prior to an interview, participants received a consent letter (Appendix A), which gave their consent to being interviewed as well as audio-recorded. The consent letter provided participants with an overview of the study, addressed ethical implications, and described the expectations of participation (one 60-minute semi-structured interview).

3.6 Methodological Limitations and Strengths

The largest limitation in this study came from the ethical parameters that only allow me to interview teachers, and conduct no observations. To observe Knowledge Building in process, as well as student participation with this approach would be very informative. Furthermore, another significant limitation was the inability to interview students about their relationship with Knowledge Building and how it may or may not impact their learning. A final limitation is the
sample size for this study. Many would consider the sample size of two or three teachers too small. Certainly this is true when it comes to making generalized statements about teaching practices and their efficacy (Creswell, 2014). However, a strength of this study is the in-depth interviews that were conducted which allowed me to gain insight and explore with experienced teachers what their experience has been with implementing Knowledge Building into their classes. Teachers were selected in a non-random, purposeful way to ensure that the teachers I interviewed have a rich understanding of Knowledge Building (DiCicco-Bloom & Crabtree, 2006).

3.7 Conclusion

In this chapter I outlined the research methodology. I started with a discussion of my research approach and procedure, and went deeper with an explanation of what qualitative research is, outlining how it differs from quantitative research. I continued with a description of the instruments for data collection and distinguished that semi-structured interviews would be the primary source of data for this study. I then identified the criteria that each participant will have to meet, and described the recruitment procedures and that convenience and purposive sampling will be used in this selection. I identified the ways in which I will analyze the data and how I will be looking for themes across the data. Ethical issues such as consent were discussed, and lastly, I discussed the methodological limitations of this study while also highlighting some of its strengths. In Chapter Four, I will report on the research findings from this study.
Chapter 4: Research Findings

4.0 Introduction

Chapter One introduced the research study and questions, Chapter Two reviewed the literature pertinent to the study, and Chapter Three discussed the research methodology for this study. The following chapter will present and discuss the findings that developed throughout the data analysis of the research interviews. Throughout the analysis, I remained mindful of my research question: what are Ontario elementary teachers’ experiences of implementing Knowledge Building (KB) in the classroom? Connections are drawn between the Chapter Two literature review and participants’ experiences and perceptions. Findings from this study are organized into four central themes:

1. Importance of creating a safe and inclusive classroom community
2. From theory to practice: Approaches teachers take when using Knowledge Building
3. Knowledge Building classrooms reportedly lead to greater student engagement
4. Teachers as learners: The need for professional development and resources

Each theme will be described, and will be followed by data and interpretation. In each section, I will discuss my findings within the context of existing literature. I will end with a summary of my findings and transition to Chapter Five.

4.1 Importance of Creating a Safe and Inclusive Classroom Community

The existence of a classroom community and the creation of a “safe-space” was reportedly significant in each participant’s implementation of Knowledge Building. In order to implement and successfully integrate KB practices, these teachers believe that a classroom environment needs to be established that allows for flexible and safe learning conditions. Both Sasha and Catherine expressed that students need to feel safe in order to actively share their
ideas. The study by Zhang et al. (2011) also confirmed that a safe learning space is essential in order to build and share knowledge. Sasha said that “for it [KB] to be effective you really have to create that safe learning environment…that first month you really have to set the groundwork for that otherwise… if they don't feel safe to share then you're not going get what you want out of it.” She also described one of the benefits of having that safe space environment and using Knowledge Building circles, in that “it provides that outlet for some students who really struggle in the written form of communication and allows them to orally express their learning. So my quietest students were the ones doing a lot of the talking in my Knowledge Building circles.”

This finding relates to the work Jang and Reeve (2010) on participating in Knowledge Building circles as a way of having a safe learning environment for students, as both participants shared. In order for this to be effective, Jang and Reeve suggest that the teacher sit with the students as a member of the group and contribute to the conversation and model careful listening. In doing this, students become respectful of one another, listen to one another, and feel safe in sharing their wonderings and new knowledge. From her experience, Catherine’s described safe space as being especially important with older kids “because they are very used to traditional way(s) of teaching.” Catherine suggested, that if

you’re going to be implementing it in your classroom do it slowly...If you throw everything that they are comfortable with out the window with the older kids…they get frightened. The younger kids not so much, they’re more flexible, they are ok. The older kids are set in their ways of what learning and what school should look like. I always spin it; we will try something new, I think it will be a lot of fun, we’re going to do it in ‘whatever’ unit. When it’s done, we’ll talk about it and if we like it we’ll do it again. I’m always honest with my students...treating them like they are part of their learning and
being very honest with them.... and again it’s that safe space thing, you want them to feel comfortable, you want them to feel they have a say. ‘If I don’t like it, then I can tell her [the teacher] or say something.’ It all goes back to that safeness.

Here, Catherine reports that, as students’ comfort level increased and a positive classroom environment was established, they began to be more independent while doing a KB circle. Spicer (2011) and Goldman et al. (2013) also found the importance of classroom environments, highlighting that a classroom environment that fosters respect for other ideas and opinions along with encouraging risk taking that develops self-efficacy, by ensuring that students have the necessary knowledge, skills, strategies to work independently.

Catherine described that when starting out, the students would always look back at the teacher after each student spoke:

the second someone stops talking, their eyes automatically look at me. As they get more and more used to the structure, they forget about you, which is good! That’s showing you that they realize that they don’t need you anymore. Which is great! And that means they are looking to each other for support.

Both teachers spoke to the importance they felt in creating a safe space in the classroom in order to successfully use Knowledge Building. This is an important finding because it highlights the importance of classroom community on students’ learning, and in order to take risks with their learning it is perceived that students need to feel as though they a part of this safe classroom community. From the experiences that Sasha and Catherine spoke to it can be perceived that creating this safe space in the classroom is a crucial first step in implementing KB in the classroom.
Creating an inclusive classroom community extends beyond the walls of the classroom. Including and communicating with parents when using Knowledge Building was described by participants as important because it may be a new approach to learning that parents may not be familiar with. Catherine described being very “diligent with sending home letters, explaining what we’re doing...I would be sending them criteria, not necessarily a rubric but a checklist of what I was looking for,” and used the curriculum expectations and report card learning skills as a way of backing her use of KB up. It was perceived by the participants that when parents were included in and aware of what was happening in the classroom they were supportive.

Creating a safe and inclusive classroom community was described as being very significant to both participants and was expressed as being something that is important to foster in order to have successful KB. It can be perceived that the teacher’s role in this is integral to the development of a safe and inclusive classroom. Scardamalia (2002) in describing her findings states that “educators play an active role throughout the process by establishing a culture where ideas are respectfully challenged, tested, redefined and viewed as improvable, moving children from a position of wondering to a position of enacted understanding and further questioning” (p. 68). This finding converges with the experiences described by the participants in that the teachers’ role in the classroom plays an important part in the development of a safe and inclusive space.

While the previous section discussed the importance of creating a safe and inclusive classroom community, the next section will focus on these teachers’ reported approaches to implementing Knowledge Building.
4.2 From Theory to Practice: Approaches Teachers Take When Using Knowledge Building

Teachers take different approaches to implementing and using Knowledge Building in the classroom. Their interpretations of the pedagogy vary in the practices they bring to the classroom. Both participants came to Knowledge Building through a familiarity and understanding of inquiry-based learning, and acknowledged that it is still new to teachers and that there isn’t one way to use this format. With KB, both teachers have interpreted and included it as an added element of inquiry-based learning in their classrooms. Both Catherine and Sasha approached Knowledge Building pedagogy by focusing in on KB circles. However, this is only one aspect of the pedagogy. In two separate instances, when asked about Knowledge Forum and the 12 Principles of Knowledge Building the participants both said that they had heard of them but did not actively use them in their classrooms. This differs from the literature, for example, Resendes et al.’s (2015) study of grade 2 students described them actively using both Knowledge Forum and Knowledge Building circles while incorporating the 12 Principles.

When getting started with Knowledge Building circles with their classes, both participants spoke to starting out with topics that are non-curricular, usually something from current events or popular culture: a topic that would be familiar to the students and that they could find a connection with. When introducing students to the format of a KB circle Sasha and Catherine would go through the rules or structure of it. Both participants referenced and used the same rule for their students when doing a KB circle. Catherine explained that “we do not raise our hands unless the person who has been speaking has stopped speaking, because if my hand is up then I am not listening, and you don’t talk when the other person is talking.” In addition to this explanation, Catherine shared that she would often show a video (of a KB circle in action) to her students to introduce them to the structure. Interestingly, Sasha referenced using a talking stick
and perhaps this is a sign of acknowledgment to the Indigenous tradition of a talking circle.

Catherine spoke to a first KB circle she had just done with a Grade 3/4 class on the topic of dinosaurs, where students also made a connection to the recent *Jurassic Park* movie, which is something that was relevant to them. Catherine started the circle off with the following statement:

I know Tyrannosaur Rex has very short arms”, and then this other kid raised his hand…and then someone said they had an add-on. “I saw the movie too and my favourite part was this.” Someone else said, “I wonder if we could do that in real life”, and then it rolled. I was then able to step out of the circle and they were able to continue without me; that was great for the first time.

Catherine was able to comfortably introduce these students to a KB circle by using a familiar topic or topic of interest. To the students it was a new classroom strategy but it did not seem so daunting because of their interest in the topic.

Similarly, Sasha picked a topic that would connect with her students and posed the question: “should cell phones and devices be allowed in the Grade 6 classroom?” Sasha explained that “it was something they were passionate about, and they had a lot to say about it, so through that we built in, the accountable talk, and one person speaking at a time and I used that to enforce the rules.” The accountable talk that Sasha is referring to is phrases such as “I would like to add-on” or “I disagree with so and so because of…” that the students would use while participating in a KB circle. Sasha felt that her students were “able to respectfully agree or disagree with their classmates instead of arguing” after developing this skill in the KB circle, she also added that these respectful behaviours extended beyond their time in the circle and throughout other aspects of the school day.
Catherine’s approach to using Knowledge Building is to use a format she refers to as SWAG. She explained that “SWAG is the four ways you can share our knowledge. So, S is share; W is wonder or ask a question; A is an add on or make a connection; G is guess.” In her class she described that there would be a “four square piece of paper” and that students would write their ideas on a sticky note and place it on the proper spot. Catherine went on to further explain this process describing that:

Do they want to share an idea they have about they have seen; do they have a wonder or question; do they want to make a connection of what they have seen, that would be an add-on; or do they want to guess about someone’s else’s question. After I’ve seen this it gives me an idea of what their thinking was…then we would sit in a circle and have Knowledge Building Circle.

Similarly, Sasha referenced using a “Wonder Wall” where students would use sticky notes to post their “wonderings” or “questions”, which would then be discussed in the KB circle. Both participant’s approaches to using Knowledge Building reflects the learning described by So, Seah, and Toh-Heng (2009) in that the students have moved from traditional learning where they are remembering information to being able to learn with understanding and sharing with ideas.

In reference to assessment, both participants spoke to using the same forms: anecdotal notes and checklists. However, Sasha acknowledged that it is something she “struggle(s) with” and is “looking to improve”. She described how assessment would be much easier with two teachers: “one to kind of run the Knowledge Building and one to record,” but is trying to make this process easier by learning different apps that could potentially help with recording and tracking. She explained that:
typically, I am either taking notes or I have a checklist where I have the student’s names all there and then I have what did they wonder or did they have a question or did they share. I put what they did when they were participating. So usually that is what I have been doing, is either anecdotal or a checklist format.

From the participant descriptions of their methods of assessment, their Knowledge Building practices would only provide assessment for and as learning, but not an assessment of learning, which would be the summative assessment. This is also a dilemma that was found in the literature (e.g., Resendes et al., 2015), as there does not seem to be research on how teachers can gather enough evidence for a summative when using Knowledge Building. Resendes et al. discussed focusing on group assessment and reporting instead of individual assessment. However, this would be difficult to do in Ontario schools, as assessment, evaluation and reporting are integral to student learning.

From their descriptions of using Knowledge Building in their classrooms it is clear that both teachers took different approaches. Although there were similarities, each teacher took their understanding of the pedagogy and adapted it for their own classroom practice and teaching. The participants did not talk about collective cognitive responsibility and these diverges from the literature. Scardamalia (2002) described collective cognitive responsibility as “the condition in which responsibility for the success of a group effort is distributed across all members rather than being concentrated on the leader and they take responsibility for understanding what is happening” (p. 68). Essentially, Knowledge Building is intended to focus on learning of the group rather than just individual learning.
This section discussed the various approaches that teachers can use when implementing and using Knowledge Building in their classrooms, this next section will discuss how a student-centered classroom can lead to student engagement.

4.3 Knowledge Building Classrooms Reportedly Lead to Greater Student Engagement

The participants both reported an increased level of student engagement when using a Knowledge Building approach. They found that, when students were presented with topics that they were passionate about they became engaged in the work they were doing. When speaking about previous KB circle experiences she had had with a class, Catherine said that the students would begin to have:

this extremely rich dialogue and become passionate about what they are learning about because they were having a conversation about it. They weren’t passive, they weren’t sitting there listening to me talk. They were engaged in a conversation about it. So I would take notes based on what they said and from there that would springboard the direction of my unit, so: what did they find really interesting? what was the piece that spoke to them?

Here, Catherine’s use of a KB circle is a tool to form a student-centered classroom by considering the interests of the students and incorporating their voices into her unit. This is similar to the idea brought forward by Zhang et al. (2011) in their analysis of KB discourse that it tends to focus on enabling inclusive and open conversations in which everyone can express their theory without being judged or evaluated. Along with that engagement, Catherine’s students reportedly started to present a certain independence or agency over their learning. Catherine expressed that one of the benefits she finds with this “new way of learning” is that she is not “the centre of it”. She said,
I found in the old way of teaching, the teacher is the only opportunity for learning and I find in inquiry based learning the teacher is no longer the only source of learning. The students themselves are teaching each other…I was able to sit on the outside and take notes and only intervene when necessary.

From Catherine’s experience it can be perceived that through the independence or agency that students were gaining through her incorporation of a KB circle her students were becoming more actively engaged in their learning.

Although Catherine and Sasha reported an overall increase in student engagement when using Knowledge Building, they also have encountered examples of student hesitation with this approach in their respective classes. Sasha indicated that there are occasionally students who just “never want to talk”. She said, “so it’s then how do you assess. The majority talk but there’s always a handful that you know, are happy to sit back and just listen and don’t really participate. So that’s kind of a struggle that I find with Knowledge Building.” Catherine shared a similar sentiment, describing some kids as “potato” kids because they don’t do anything. She expressed that:

No matter, you as the teacher, you’re going to try your best to engage them and what I like this model is you’re finding their way in. But there are some kids that are just not going to be excited about school, and they really don’t care. Does it work for 100% of the kids all the time, I would be a liar if I said yes, but no structure works 100% of the time with all the kids.

Along with creating at student-centered classroom, Knowledge Building was also described as lending itself to differentiation of instruction, by providing multiple or different avenues for students to express their learning. With regards to students with Learning Disabilities, Catherine
shared that students “have more opportunities for oral instruction and assessment...these kids are able to have their own ‘in’ in the area that interests them... I’m finding it’s a way to engage those students and provide an opportunity for them to show their learning because it is more open-ended. I do see successes in it.” Sasha expressed a similar sentiment; however, she interestingly added that she found that sometimes with her students that would be classified as “higher students” so those students who were high achievers and often got good grades, struggled with KB “because it’s not as structured.” Adding to the benefit of the aspect of differentiation with Knowledge Building, Catherine indicated that “sometimes you’d be shocked at the things they bring to the table, stuff that I wouldn’t even think of because everyone’s brain works differently, everyone makes different connections, sees different patterns.” Recognizing the importance of student voices in their learning, and having that student-centered environment in a classroom. This finding converges with findings from a study by So, Seah and Toh-Heng (2009), that looked at whether Knowledge Building could be beneficial to both high-achieving and low-achieving students. They found that the collaborative nature of KB was beneficial for all students, especially with those with diverse learning needs.

Throughout this section, examples have been shared from the participants on their perceived beliefs on how they believed that their students were more engaged when their teaching became more student-centered and they started using Knowledge Building. The following section will focus on teachers as learners and the need for further Professional Development and resources on Knowledge Building.

4.4 Teachers as Learners: The Need for Professional Development and Resources

When implementing new pedagogies such as Knowledge Building into the classroom, teachers believe that they need to have access to more training and resources to better their
confidence in bringing KB forward in a classroom. While the participants expressed an interest in personal professional development (PD) and that they have initiated a lot of their own learning, they both indicated that there is a need for further PD and resources, especially on Knowledge Building. They both shared their perspective that, when there is that PD offered by their respective school boards, it tends to be more aimed at inquiry-based learning as a whole. Sasha was introduced to Knowledge Building through her former Principal, and Catherine through a webinar shared across various boards. Sasha cited using the Natural Curiosity website as a resource but felt like finding resources was “left to the teacher to investigate and probe.” Catherine was very optimistic about the future and expressed a hope for new documents and “waiting to be wowed”, just as she was with the new Kindergarten curriculum. She said that, “we’re hoping that Knowledge Building will be embedded in the documents, embedded in the curriculum documents.”

When the participants were asked what they would like to see in terms of professional development and resources, they both proposed something more visual: seeing Knowledge Building in action. Sasha felt that PD and support for teachers should occur more regularly, adding that it should be “in the form of a mentorship program or some type of mentoring. Having the opportunity to actually visit and see, along with networking with other teachers, because I find that really makes a difference rather than just reading a book. Like seeing it in action is huge, for that type of thing.” Catherine similarly expressed that “a lot of teachers need to see it to feel comfortable,” and while recognizing that there is no one way or outcome in this kind of teaching added that she “would have loved to have seen how a unit would unfold.”

Catherine and Sasha both alluded to support and collaboration in their answers from Principals and colleagues. This relates to Zhang et al.’s (2011) analysis of teacher and Principal
engagement that showed a number of supportive conditions such as shared vision, an understanding of Knowledge Building principles, teacher professional opportunities, and leadership that support innovation at all levels. As well, throughout the interviews with Sasha and Catherine it was evident that trust was very important. This correlates with Scardamalia, Reeve, and Messina (2008), who found that trust among one another, along with trust and student ability to guide their own learning was visible in their study. In the classroom the teachers were able to work with emergent rather than fixed goals and they were able to take advantage of new opportunities rather than relying on fixed routines.

This section discussed the ways in which teachers are also learners. As well, it displayed how both participants felt like there could be further resources could be made available on the topic of Knowledge Building for example a seeing it in curriculum documents and a mentorship program.

4.5 Conclusion

Through the analysis process four central themes emerged. The first theme that emerged was that these teachers believe in the importance of creating a safe and inclusive classroom community in order for Knowledge Building to succeed. Students need to feel safe in order to feel confident enough to share their ideas, so setting a standard of respect is crucial for this success. The second theme that emerged was how teachers’ practice of Knowledge Building is different from the pedagogy as a whole. The participants interpreted the pedagogy in various ways and then have taken different approaches when implementing it in the classrooms. The next theme that emerged focused on how these teachers perceive that the student-centered classrooms created by KB can lead to greater student engagement. For the participants, Knowledge Building offered a way to make their classrooms more student-centered which they believed lead to more
engagement and differentiation of student learning. The final theme which emerged was teachers’ reported need for more professional development and resources in the area of Knowledge Building because teachers are learners as well.

From this study it can be perceived that the participants have had an overall positive experience with implementing Knowledge Building into their classrooms. They both expressed how they felt their students were engaged when using it and see the perceived benefits for students that can come from KB. The participants acknowledged some of the drawbacks and areas of improvement such as assessment, and offered suggestions for how they believe they could further develop their KB practice in the future. Next in Chapter Five, I discuss broad and narrow implications for these findings, give recommendations and note potential areas of further research.
Chapter 5: Conclusion

5.0 Introduction

In this final chapter, I will begin by summarizing my findings from my research study, followed by suggesting broad implications of my findings and their effects on different stakeholders in Ontario education, such as schoolboards, teachers, administrators, parents, and teacher education programs. I will also illustrate some narrow implications for my own professional identity and teaching practice. I will then offer recommendations based on the broad and narrow implications. Finally, this chapter will conclude with a discussion of areas of future research that I believe should be developed.

5.1 Overview of Key Findings and their Significance

For this study, two Ontario elementary school teachers were interviewed on their experiences with implementing and using Knowledge Building (KB) in their classrooms. From these findings four main themes emerged which were discussed in Chapter Four.

The first theme that emerged from the findings was the importance of creating a safe and inclusive classroom community in order for Knowledge Building to succeed. Both participants spoke to the need to establish a ‘safe space’ in the classroom that allow for flexible and safe learning conditions. They expressed that students need to feel safe in order to feel confident enough to share their ideas and take risks with their learning so establishing and setting a standard of respect in the classroom was expressed to be crucial in order for KB to be successful. In terms of having an inclusive classroom community it was expressed that students who struggled with the written form found it easier to express their ideas during a Knowledge Building circle. The participants also shared evidence of students building independence and collective responsibility through the practice of KB circles, which they viewed as a success.
Another theme which emerged through the findings was how teachers’ practice of Knowledge Building was different from the pedagogy as described in the literature. The teachers interviewed had varied interpretations of the pedagogy which reportedly resulted in some different classroom practices when implementing it. Both participants approached the pedagogy of Knowledge Building by focusing on KB circles, leaving out two other components of the pedagogy – the 12 Principles and Knowledge Forum. Although both teachers claimed that they had heard of both components before, neither reported including them in their planning or classroom practice. Knowledge Building was viewed as an extension of inquiry-based learning with the added element of the KB circle. However, within the circle both teachers reportedly used a similar structure and rules with students but reportedly added their own elements. For instance, Catherine reported using SWAG (share, wonder, add-on, and guess) and Sasha reported implementing a Wonder Wall. In addition, both participants reported using similar methods for assessment but expressed that they found this area to be a struggle.

The third theme that emerged through the findings focused on how teachers perceive that student-centered classrooms can lead to student engagement. For the participants, Knowledge Building was a tool to use in the classroom that offered a way to make them more student-centered. Through KB, they were reportedly able to consider student interests and incorporate their voices which they believed lead to further engagement and differentiation of student learning. They felt that through the process of KB students became more passionate about their work and began to present a certain independence or agency over their learning because the teacher was not the centre of it. As well, the teachers reported found that through the structure of KB that they had created in their respective classrooms, students were able to their own way of
interacting with the work which was beneficial to students who may have struggled in other areas such as writing.

The final theme which emerged from the findings was teachers’ perceptions of the need for more Professional Development and resources in the area of Knowledge Building. KB promotes the idea of students becoming life-long learners, and the same goes for teachers. Both teachers referred to themselves as such. They also expressed the need for access to sufficient training and further resources on Knowledge Building. The teachers suggested that a mentorship program with other teachers would be beneficial in allowing them to see KB in action with other classes.

The four themes that emerged from the findings will be further addressed through the implications section with regards to the following stakeholders: students, parents, teachers, administrators, policy makers, and teacher education programs.

5.2 Implications

This section is divided into two sub-headings where I will discuss first, the broad implications for several stakeholders in the education community, such as students, parents, teachers, administrators, policy makers, and teacher education programs. Secondly, I will highlight the narrow implications for my own professional identity and teaching practice.

5.2.1 Broad implications: The educational community

As discussed in Chapter One, Knowledge Building gives learners a new way to investigate and share new knowledge with one another. Students are actively involved in their own learning, while adding to each other’s ideas. KB has a foundation of 12 Principles that are rooted in pedagogy and research. The literature is very clear about the importance of these 12 Principles, such as, idea improvement, improvable ideas and democratizing knowledge. It came
as a surprise to me when both participants of this study alluded to the concepts in the 12 Principles, but did not report using them in their classroom practice. That is, they talked about the concepts but didn’t realize that it was part of the 12 Principles, which is the foundation for Knowledge Building. This led to the theme that KB theoretical pedagogy can be different than practice. KB principles are inherent in the practice but teachers may not be purposefully embedding them in their teaching and learning. The KB principles themselves can actually be considered the implications for this study; and this is done purposefully. The KB principles as implications or “KB in Action” can actually apply to all the stakeholders in the educational community: students, parents, teachers, administrators, and teacher education programs. As Knowledge Building is transformative in nature, it seems appropriate that this is reflected in the implications of this study. The 4 KB Principles that are highlighted in this study as implications are:

1. Real Ideas, Authentic Problems
2. Democratizing Knowledge
3. Knowledge Building Discourse
4. Improvable Ideas

My research findings on the reported implementation of Knowledge Building in the elementary classroom have the greatest implications for those in the educational community who spend each day in the classroom – students and teachers. The first implication of using Real Ideas and Authentic Problems, is that the participants described their students as having an opportunity as being empowered to be responsible for their own learning. Their wonderings were at the centre of the learning. Both participants spoke of using the students’ interests and curiosity as a catalyst for new ideas. They expressed that when students were presented with topics they were passionate about they became engaged in the work they were doing. The implication for teachers
is that they may be more than facilitators or someone who imparts knowledge, but rather, they may be provoking the thinking of their students when they find creative ways to introduce ideas and to subject matter that is of interest to the students.

Another implication, Democratizing Knowledge, is that everyone can be a contributor; students, teachers, parents and administrators are all learners. Everyone’s work is important. The participants spoke of how with KB the teacher is no longer the one at the front of the class and suggested that letting go of control is very difficult for some but for those who do, it is very exciting. In the classroom, it is not only the teacher that is the keeper of the knowledge and in a school, it is not only the administrator - everyone is co-learning. In working together, students support one another in learning. This would also be the same for teachers. With Knowledge Building being a fairly new practice in Ontario schools, the participants of this study both stressed the importance of ongoing Professional Learning. This could take the form of workshops, school learning teams, or even observing other teachers using KB in their classrooms even expanding this to a mentorship program. They spoke of participating in webinars but felt that it was not enough. Both participants described Professional Learning that their administrators had organized for teachers would have a big impact on the student learning. Administrators may be learning alongside teachers.

A third implication is the role that KB discourse plays in the learning. This discourse is both the discussion that can occur in the Knowledge Building circles, as well as the discussion on Knowledge Forum. This is how the new knowledge is shared with one another. With KB discourse students have an opportunity to not only express and get feedback on their ideas but more importantly, to build on ideas and create new knowledge. Questions lead to more questions. The participants described the rich dialogue from the students when they were passionate about
what they are learning. They were engaged in a conversation about it, rather than passively listening to the teacher talk. The importance of student voice was described by both participants. Although Knowledge Forum is an important way to document the learning using technology, neither participant was using Knowledge Forum in their schools. Rather they were using alternative methods to make the learning visible to the students using a bulletin board with their notes. This implies that without using Knowledge Forum, the implementation of KB may still be in the beginning stages in many Ontario schools.

Another implication is Improvable Ideas, that is, that all ideas are treated as improvable. Through KB, students act as researchers and discover either the answers to their wonderings, or come up with new questions. In order for this to happen, both participants spoke of the importance of providing a safe and inclusive classroom community. The students need to feel safe to take risks in their learning. Once that is established, the students are like researchers. The learning that was described in the study had critical thinking and problem solving embedded in all lessons. The teachers spoke of creating an environment for students where there were able to share information with one another, and to build on each other’s learning, which is referred to diversity of ideas in KB. The educators played an important role, they modelled how to contribute and extend ideas, how to question and how to carry out an investigation of one’s ideas. Catherine spoke of being able to step out of the circle and the students were able to continue the learning on their own. The teachers also need a safe learning space as they are venturing into unknown territory and they both spoke of having supportive administrators who encouraged their learning. Teachers who have the support of their administrators may be able to access resources such as professional development to support the use of KB pedagogy in their classes.
In order for Knowledge Building to be successful in the school, the parent community has to be included in the sharing of information. As this for many is a new way of thinking, it could potentially raise parental concerns. But participants spoke of their parent communities as being supportive of this new type of learning. However, this came about because they reportedly informed the parents from the beginning of the school year, and continued to share information and new learning. Educating the parents so that they can be an informed partner may make the transition to a Knowledge Building focused classroom more positive. Where KB is implemented and children are enthusiastic about learning parents may be more satisfied.

The final implication is for teacher education programs in Ontario, in preparing teachers to feel comfortable in implementing Knowledge Building practices throughout the day. Inquiry-based learning and Knowledge Building are now embedded in many of the Ministry documents and curriculum.

The broad implications listed above have incorporated some of the 12 Principles of KB which are inherent to the practice of Knowledge Building. Recognizing the value in these principles holds implications for stakeholders in the educational community. In the following section, I will highlight implications from my findings for my own professional practice.

5.2.2 Narrow implications: Professional identity and practice

My work on this research study has been extremely valuable to my development as both a teacher-researcher and an educator, and the findings of my study formed a number of implications for my future practice. As my study has progressed I have found myself taking further courses on Knowledge Building and working to implement its practices with students through my practicum experiences.
Throughout this whole research study there has been continued emphasis on the importance of being a life-long learner. This is something that I want to continue myself and model for my students. Education is continually changing and I want to continue to learn about new things in education, new practices and pedagogies, and ways I can improve my classroom. Since Knowledge Building is still an emerging classroom practice I hope to continue to develop my understanding of it and share this with others. To be a life-long learner I know that it is important to be an advocate for my own Professional Learning. School budgets will not always have the ability to support Professional Learning in this area so I will have to remain aware that seeking out ways to expand my learning may be something that will be independent.

Another implication for my own practice is the importance of collaborating and co-planning with other teachers. I believe that this is especially important when trying new things in the classroom such as KB and with the support of colleagues to share practices and resources implementing new things into the classroom can seem less daunting. As well it is important to have this support when making a conscious effort to take on the role of the teacher as facilitator rather than the holder of knowledge which is important for a successful KB classroom but also a shift in the way teachers may currently view their role.

I believe that by implementing Knowledge Building into the classroom I will be able to form a learning environment that is inclusive and more accessible to all students; where students can transform wonder into knowledge. By using student inquiry as a driving force for their learning, students’ experiences, backgrounds, and intelligences are valued and incorporated into the classroom. This ties in, I believe to the purpose of schooling which develops inquiring, caring, and engaged citizens.
5.3 Recommendations

In the previous section, the implications of my findings were highlighted. The following section will focus on recommendations based off the implications, and will serves as suggestions for stakeholders in the educational community.

Participants spoke in great length about the need for further resources and professional development on Knowledge Building when getting started. They felt that any professional development that they had received almost exclusively addressed inquiry-based learning and not KB. Administrators who are interested in having Knowledge Building implemented in their schools should provide more professional development opportunities for teachers through workshops and training, especially on the use of Knowledge Forum; as well as sharing their vision for the implementation in the school. By allocating funding and time, and furthering teachers’ understanding of KB will only lead to a more concrete implementation of it with the integrated aspects of the 12 Principles and Knowledge Forum.

Along similar lines, participants noted that seeing KB done in other classrooms while learning it, as well as a mentorship with other teachers would be useful. A recommendation for this implication is that school boards and schools should develop partnership programs and mentorships among teachers so that observations and seeing it action could take place. This collaboration between school boards, schools, and teachers would allow for teachers to share resources and ideas that can further benefit students and help to support and ease comfort with trying new things in the classroom. Another way to achieve this professional development for teachers is perhaps the creation of a speciality role, such as a Knowledge Building champion as someone who could train and be that mentor for teachers trying to implement it in their classroom.
In terms of Teacher Education programs, it is imperative, that future teachers are not only researching the Knowledge Building pedagogy, but that they have many opportunities to see this in practice, whether through practicum or modeled in the Teacher Education programs. In the next section, suggestions will be made for further areas of research based upon potential gaps that were found in the literature from Chapter Two.

**5.4 Areas for Further Research**

In this section I will highlight the areas of research where I felt there were potential gaps, offering suggestions for further research. I found it interesting how little research I was able to find on Knowledge Building in the classroom within an Ontario context. However, there is a wealth of resources in the form of podcasts, videos, and resources specifically from the website “The Learning Exchange,” which has been made in consultation with the Ontario Ministry of Education, Student Achievement Division. As well, in the existing academic literature there has been a large focus on Knowledge Forum and the technological aspect of KB. While these are crucial components of the pedagogy, my findings suggested that they are not necessarily carried out into the classroom. As an area for future research, I think it would be interesting to further understand on a greater scale why Knowledge Forum is not used in classrooms and what teachers use in their classrooms to supplement technology.

Another area for further exploration and research would be to look at Knowledge Building as a pedagogy that would be beneficial for students with Learning Disabilities. Both participants alluded to it as being successful in their experience, but research with a larger sample size with the ability to gain student perspective would be an interesting area for further research. As this is a question that I still have about Knowledge Building it is something that I will further inquire about through action research with my students.
5.5 Concluding Comments

As the world is continually changing, the way in which students are educated needs to change along with it. As stated in Ontario Ministry of Education’s (2009) document *Ontario’s equity and inclusive education strategy*:

Education directly influences students’ life chances – and life outcomes. Today’s global, knowledge-based economy makes the ongoing work in our schools critical to our students’ success in life and to Ontario’s economic future. As an agent of change and social cohesion, our education system supports and reflects the democratic values of fairness, equity, and respect for all. The schools we create today will shape the society that we and our children will share tomorrow. (p. 6)

Knowledge Building relates to this sentiment and can serve as a classroom pedagogy that can fulfill these goals and values. I hope that this research helps to inform incoming teachers and those already in the field not only on the topic of Knowledge Building but on the ability to be adaptive and flexible in the classroom. It is important for educators to reconsider their roles in the classroom and be conscious of students’ interests so that along with their students they are part of the learning process.
References


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Appendices

Appendix A: Letter of Signed Consent

Date: _________________________________

Dear _______________________________,

My name is Cassandra Reda Gavin and I am a student in the Master of Teaching (MT) program at the Ontario Institute for Studies in Education at the University of Toronto (OISE/UT). A component of this degree program involves conducting a small-scale qualitative research study. My research will focus on teachers’ experiences of implementation of Knowledge Building in the elementary classroom.

I think that your knowledge and experience will provide insights into this topic.

Your participation in this research will involve one roughly 60 interview, which will be transcribed and audio-recorded. I would be grateful if you would allow me to interview you at a place and time convenient for you, outside of school time. The contents of this interview will be used for my research project, which will include a final paper and informal presentations to my classmates. I may also present my research findings via conference presentations and/or through publication. You will be assigned a pseudonym to maintain your anonymity and I will not use your name or any other content that might identify you in my written work, oral presentations, or publications. This information will remain confidential. Any information that identifies your school or students will also be excluded.

The interview data will be stored on my password-protected computer and the only person who will have access to the research data will be my course instructor. You are free to change your mind about your participation at any time, and to withdraw even after you have consented to participate. You may also choose to decline to answer any specific question during the interview. I will destroy the audio recording after the paper has been presented and/or published, which may take up to a maximum of five years after the data has been collected. There are no known risks to participation.

Please sign this consent form, if you agree to be interviewed. The second copy is for your records. I am very grateful for your participation.

Sincerely,

Cassandra Reda Gavin
**Consent Form**

I acknowledge that the topic of this interview has been explained to me and that any questions that I have asked have been answered to my satisfaction. I understand that I can withdraw from this research study at any time without penalty.

I have read the letter provided to me by Cassandra Reda Gavin and agree to participate in an interview for the purposes described. I agree to have the interview audio-recorded.

Signature: ______________________________________

Name: (printed) ______________________________________

Date: ______________________________
Appendix B: Interview Protocol/Questions

Thank you for agreeing to participate in my research study, and for making time to be interviewed today. This research study aims to learn how teachers implement Knowledge Building into their classrooms, for the purpose of exploring teacher experiences that can guide new teachers as they familiarize themselves with new pedagogies. The interview will last approximately 60 minutes, and I will ask you a series of questions focused on your experiences. I want to remind you that you may refrain from answering any question, and you have the right to withdraw your participation from the study at any time. As I explained in the consent letter, this interview will be audio-recorded. Do you have any questions before we begin? To begin can you state your name for the recording?

Background Information

1. What grade do you currently teach, and where do you teach?
   a. How many years have you been teaching at the school?

2. How many years have you been an elementary teacher?

3. How were you introduced to Knowledge Building?

4. To what extent have you been able to further your own professional development on the topic of Knowledge Building?

5. So I can get a sense of your students in your school, can you describe your school demographic and community?
   a. Size/population
   b. Socio-economic status
   c. Ethnicities

Teacher Perspectives/ Beliefs

6. Do you consider yourself an inquiry-based teacher? Why or why not?

7. What prompted you to begin using Knowledge Building in your classroom?

8. What do you believe students can gain from using Knowledge Building in the classroom?

9. How your view does Knowledge Building complement the Ontario elementary curriculum?
   a. Can you give me an example of a lesson?
10. What in your view makes Knowledge Building a powerful strategy?

11. What in your view are some of the drawbacks of Knowledge Building that you have experienced?

12. Can you describe how you begin the process of Knowledge Building in your classroom each year?
   a. Prompt: how is it introduced to a group of students for the first time

13. Please walk me through a typical lesson where are you use Knowledge Building strategies. → look in guide for prompts to help them sketch a detailed account

14. To what extent are your students able to support each other to the Knowledge Building process?
   a. Can you give me an example?
   b. How has this impacted your classroom dynamic?

15. Can you describe your approach to assessment when using Knowledge Building?
   a. What methods do you find most effective and why?
   b. What is the biggest challenge of assessment when using Knowledge Building?
   i. Prompt: for example group work

16. When using Knowledge Building, how do you strike a balance between meeting Ontario curriculum expectations and allowing for student interests to guide learning?

17. Are you familiar with the 12 Principles of Knowledge Building?
   a. (If yes) To what extent do you implement them in your planning?
   b. (If yes) Which principle(s) do you find the easiest and hardest to implement?

18. Are you familiar with Knowledge Forum?
   a. (If yes) To what extent is Knowledge Forum used in your classroom?

**Supports and Challenges**

19. Have you faced any barriers when implementing or using the Knowledge Building in your teaching?
   a. (If yes) What are those barriers?
   b. (If yes) How have you managed those barriers?

20. What supports or resources are available to you in using Knowledge Building?
   a. (If any) Are these sufficient?
   b. (If none/few) Which supports and resources would you like to see?

21. What kind of feedback have you had from people outside the classroom (ie. parents, coworkers) regarding your use of Knowledge Building?
Next Steps

22. What advice would you give to a beginning teacher looking to include Knowledge Building in their classroom?

23. What goals do you have for your future use of Knowledge Building in the classroom?

24. Do you have any final thoughts?

Thank you for your participation in this research study.