Questioning student questioning:

*Helping primary students begin to take more responsibility within the inquiry cycle (independent, small group and whole class inquiry activities)*

by

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ABSTRACT

This study used action research as a method to reflect on the impact of student questioning on inquiry learning, including student engagement and motivation. Conveyed through the lenses of the teacher, the parent, and most importantly, the student, the purpose of this project was to see how questioning could be used to foster a culture of awareness through reflection and improvement to our teaching and learning in an environment that openly embraces an inquiry stance as best practice. In the interest of empowering students to assume increasing ownership of their learning, the research question explored the impact of teaching a specific framework for question formulation. The results and outcomes of this initiative clearly demonstrate how the development of these questioning skills and behaviours empower the learners to conceptualize and express their thinking without having to depend primarily on teacher questioning to provoke or promote their natural curiosities. With this end in mind, the research questions asks, “If we consistently engage learners in the QFT™ process, in what ways will their questioning behaviours strengthen and/or change?”
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Chapter One: Problem to be Investigated

Purpose Statement

“I have undertaken to say a few words to you on the ‘Art of Questioning’.
It is a subject of great importance to all of you who desire to become good teachers; for, in truth, the success and efficiency of our teaching depend more on the skill and judgment with which we put questions than on any other single circumstance” (Fitch, 1879).

In an era where educators worldwide continue to debate the merits of inquiry-based learning, it is not surprising to find out that this excerpt was taken directly from a speech made to a captive group of public-school teachers. What is curious, however, is the fact that C.W. Bardeen delivered this speech on January 22, 1879, as quoted in Fitch’s Art of Questioning (1879).

In my opinion, Mr. Bardeen’s words become immediately tenable when we consider the fact that the notions of inquiry-based learning and teaching, where questioning plays an integral role in the learning process, remain a highly contentious and debated topic 135 years later.

Although many people would argue that the very essence of inquiry-based learning and questioning can be ascribed back to the philosophical and scientific perspectives of the Greek philosopher Aristotle, along with that of both his mentor, the classical Greek Athenian philosopher, Socrates as well as his student, the classical Greek philosopher and mathematician, Plato; it is, in fact, the prophetic words of Mr. Charles William Bardeen, American educator and publisher, that have led me to question my teaching practices and whether I could or should endeavor to improve both the ways I teach along with the ways that the students acquire knowledge while in my care as learners.
Working in a school that embraces a very clear stance on inquiry as best practice learning and teaching, I am part of a group of committed educators who are always looking and considering, either independently or as a staff, for ways to improve the learning and teaching in the overall school environment.

As I neared the completion of my first year of Post Graduate studies, the idea of initiating and sustaining student engagement throughout inquiry activities was becoming a prevalent topic in discussions with the other members on staff. Specifically, many of us wondered out loud if it would be possible to help our students assume increasing responsibility for their learning from the outset of our inquiry learning engagements.

During these impassioned and occasionally contentious discussions, that have proven to be eminently resourceful for our entire school community in continuing to enhance our overall position on inquiry as an effective means for both teaching and learning, there have been many questions that have fostered this stance. The following questions that we have asked ourselves and debated together reflect the nature of inquiry-based teaching and learning in general as well as the specific aspect of student questioning and its potential impact on student learning and engagement:

• Where are we going with inquiry-based learning?
• Will developing a deeper understanding of the historical perspectives of inquiry-based teaching and learning foster self-awareness and growth within the members of a specific learning community?
• What is the relationship between what we think questions are and what they are for?
• What is the role of teacher questioning in inquiry-based instruction?
• How do we give students a voice to ensure their place in the learning process?
• What role can students’ questions have in the learning process, and how can they (both students and their questions) be stimulated?
• Does student questioning ensure/direct student learning and/or engagement?
• If so, in what ways does student questioning ensure/direct student learning and/or engagement?
• Are there specific techniques to promote or teach student questioning?

Ultimately, these questions brought us to a point where we asked ourselves:

• Should student questioning be at the genesis of the inquiry process in order to achieve more meaningful and authentic learning engagements for our students?

And, if so then,

• How can we as teachers facilitate this learning journey for our students?

Justification of the Study

For the past six years, I have had the opportunity to teach and learn in two different International Baccalaureate (IB) World Schools (Primary Years Programme), where the educational framework is based on a commitment to structured inquiry as an ideal tool for teaching and learning. More specifically, in the Primary Years Programme (PYP), the students are taught to view their learning as a means to asking questions and looking for answers, in hopes of building on these experiences to come up with newer and more complex questions in need of answers.

As a mindful teacher, I have constantly been pursued by a desire to answer two powerfully burning questions which simply ask, “Will teaching from an inquiry mindset have the necessary impact on the learners in question to develop inquiring, knowledgeable and caring young people who help to create a better and more peaceful world through intercultural understanding and respect?” and, if so, then, “What does authentic inquiry-based learning truly look, feel and sound like?”

In attempting to narrow this down and to find a viable and relevant topic to look at as a focus
for this study, it didn’t take long for me to pinpoint the notion of student questioning. Considering the discussions we were having as a staff regarding the students taking more ownership of their learning, I began to consider how their abilities to become more involved in helping to map out their inquiry learning engagements would impact on their motivation and feelings of success and/or achievement. In my opinion, this could not be possible until the students were able to play a more significant role in generating the initial questions that would essentially facilitate and guide any subsequent learning opportunities. To this end, a somewhat obvious question began to take shape as I wondered to myself whether teaching a specific framework to formulate and ask ‘beginning’ or ‘leading’ questions would, in fact, deepen the inquiry experience for the (primary) learners.

On one hand, as a practitioner researcher, I am most interested in exploring how we, as educators, foster a culture of inquiry in our youngest (early primary) and, in my opinion, most impressionable learners, especially given the fact that much of the research literature that I have gauged tends to focus on students in higher grades (later primary and above). I share the belief of John Barell (2008) that inquiry learning and, in particular, student questioning is relevant and very possible with, “students in all classes, at all grade levels, and with widely varying interests and abilities”, if, as he goes on to say, “we afford them the opportunities” (p. 4).

On the other hand, as a reflective classroom teacher, I am continuously seeking ways to help these young and curious individuals become more inquisitive about the world around them by learning to ask questions, by working independently, in small groups or as a whole class to solve problems, and by reflecting on and thinking critically about meaningful and relevant learning opportunities.
The ability for learners to initiate inquiry-learning experiences is by no estimation a small task. J.T. Dillon (1984) asserted that “contrary to common sense, questioning is a complex skill” (p. 53); a skill that he suggested could only be acquired or mastered through practice and training. However, Dillon suggests that research does very little to substantiate an understanding of how best to promote discussion and the effective use of questioning other than what is suggested in teacher manuals.

To this end, like other research advocates over the years, Dillon (1984) offered many valuable suggestions for teachers to implement in their classroom environments that would ultimately enhance the level of discussion and questioning. However, in my opinion, what was and has been missing in terms of teaching questioning skills for learners of all ages is a specific skill set that could help students become more competent in asking the questions themselves rather than depending on or waiting for the teacher to initiate the process for them.

It was during a conversation with one of my professors who works closely with educators throughout the world in the area of determining best practices for inquiry learning and teaching that I was introduced to a recent publication that describes a research-based framework for developing student questioning (Rothstein & Santana, 2011). It is my belief that this clearly defined and articulated protocol will be the perfect fit in helping young primary learners take even more responsibility for their learning by beginning to conceptualize their thinking without having to depend on teacher questioning to provoke and promote their natural curiosities.

In their book Make Just One Change: Teach Students to Ask Their Own Questions (2011), the authors and Co-Directors of the Right Question Institute, Dan Rothstein and Luz Santana, make two simple arguments that “all students should learn how to formulate their own questions” while at the same time “all teachers can easily teach this skill as part of their regular practice” (p. 1). Further,
Rothstein and Santana believe that the very nature of education for students can be transformed if the students themselves, rather than the teachers, assume more responsibility for asking or posing questions; a skill they believe is the single most essential skill for learning, one that will better equip and enable learners “to become independent thinkers and self-directed learners” (Rothstein & Santana, p. 3).

Research Question and Hypothesis

To help support and enhance learning for the students in my grade two class, I made the decision to implement the protocol that makes up the Question Formulation Technique (QFT™) as outlined in Make Just One Change: Teach Students to Ask Their Own Questions (Rothstein & Santana, 2011).

Rothstein and Santana (2011) underline the six core components of the QFT™ as follows:

1. A Questions Focus (Qfocus), usually developed by the teacher that serves as the jumping-off point for student questions,
2. A process for students to **produce questions** using a set of four simple rules,

3. An exercise for students to work on **closed- and open-ended questions**,

4. The students’ selection of **priority questions**,

5. A teacher and student **plan** for **next steps** – how they will use the priority questions,

6. A **reflection activity** for students to name what they have learned, how they learned it, and how they will use what they have learned (p. 4).

Developed and refined over the course of two decades, the QFT™ is a clearly defined and step-by-step process, which, in my opinion, will strengthen and enhance the learning capacities of these, and potentially, other learners. Within the general context of their work and research, Rothstein and Santana (2011) continued to wonder what would happen if students themselves learned to ask the questions - the very question at the heart of this study.

The authors assert that in order for students to assume more responsibility for their learning and to become the questions posers, ultimately becoming proficient in using the QFT™, they must become aware of and increasingly familiar with the following three distinct thinking abilities: divergent thinking, convergent thinking and metacognition. Rothstein and Santana (2011) describe them as “the ability to generate a wide range of ideas and think broadly and creatively (divergent), the ability to analyze and synthesize information and ideas while moving toward an answer or conclusion (convergent), and (metacognition) the ability to think about one’s own thinking and learning” (p. 16).

It is my opinion that these three thinking abilities are fundamental building blocks in any learning environment that embraces inquiry as a stance for thinking and learning. In my work with young primary learners, I have always found it helpful to develop the students’ understanding and awareness for why we make the choices we do. I was not fully aware of how much this impacted the learning for my students until a District colleague who had spent some time in the classroom...
observing the students while engaged in the learning process remarked that I was, “like the pied-piper of inquiry” and that I was “continuously and carefully narrating the learning journey for my students”.

With this in mind, my hypothesis for this study is that when learners acquire the skills and refine their capacity to ask more meaningful and relevant questions, it will enable them to develop a stronger sense of ownership of their inquiry learning. To this end, I posed the question: “If we consistently engage learners in the QFT™ process, in what ways will their questioning behaviours strengthen and/or change?”

**Overview of the Study**

In August 2013, prior to commencing the academic school year, I submitted a study proposal to my project supervisor outlining the intentions for this study/project. Subsequently, in September 2013, as part of my regular teaching routines, I began to teach and implement the framework for the QFT™ with the 17 students in my Grade two class. This included recording specific comments and questions by the students during these lessons, as well as documenting the information from two further lessons in which I recorded specific notes related to the three questions outlined on the guiding questions form in Appendix A (*Guiding Questions for Student Participants*). The information from the latter two lessons was used as a baseline to inform me of the students’ current understanding of the nature of questions in a classroom context. The same three questions were asked to the students towards the end of the study in May 2013. Ultimately, the information from both question periods was analyzed to determine the level of awareness and metacognition exhibited by the students towards their learning as well as looking at the students’ understanding of the importance of questioning within the inquiry process.
In addition, the QFT™ process was administered a total of six times during two different units of inquiry, in Matter and Mapping. In both units, I administered the process on each occasion applying a different approach to complement the nature of inquiry that we endeavor to develop in our students at Sequoia Park Primary. To this end, the first application was done with the whole class, the second in small groups and the third and final implementation within each unit was done individually. The questions that the students generated during these activities were used to develop a variety of learning engagements that would allow the students to investigate possible answers or solutions to their questions during individual, small group or whole class inquiry activities.

Although the main focus of this study occurred while working with the students in the classroom, I was also able to gain much insight from the parents of the grade two students as well as from my colleagues at both Sequoia Park Primary and Maybank Elementary, both IB World Schools who embrace an inquiry stance as best practice teaching and learning. These contributions by both parents and colleagues were in the format of voluntary and anonymous questionnaires (Appendices B and C respectively). Those parents or colleagues who chose to provide their perspectives sent them directly to a designated third party (school Administrative Assistant) who took the responsibility to transcribe the comments into electronic format so as to maintain the maximum amount of anonymity of the participants. The information provided on the questionnaires was used to gauge the varying perspectives around our approaches to teaching questioning skills and to further substantiate the need for us as teachers to utilize a specific framework for teaching student questioning.

The results of the action research were shared with all participants and the school community in general in the form of an information blog written on the school’s website. Additionally, the data and information was further shared and clarified with the staffs at both Sequoia Park Primary and
Maybank Elementary during their respective staff meetings in the spring of 2013. Finally, a full written summary will be made available to participants upon request.
Chapter Two: Literature Review

“One of the important points of teacher research is that it MUST lead to improvements in teaching” (Mariana Souto-Manning, 2009, p. 49).

To inform and improve upon my own classroom practices as well as to gather a breadth of research literature to better inform my work for this project, I have drawn insights and perspectives from a limited range of research and fieldwork in the areas of action (practitioner) research, inquiry research and learning, student questioning, engagement & motivation, and classroom discourse (academic language development).

Although my intention for this project was to systematically look at the benefits that a specific framework for generating questions could have on the inquiry-based learning experiences for primary learners, I could not underestimate the potential impact that these observations and findings could have for learners of all ages as well as for educators who are seeking new ways to connect the learning in the classroom to the students’ lives outside of school.

For me, this personal understanding has been further substantiated through the viewpoints and words of Mariana Souto-Manning (2009), Marilyn Cochran-Smith and Susan L. Lytle (1993) each in their quests to provide a deeper understanding for teachers as researchers, along with the insightful and influential perspectives of John Barell (2008), who has worked directly with teachers in schools to foster inquiry, critical thinking and reflection.

In her article written to help educators better understand the roles and responsibilities of teacher as researcher, Souto-Manning (2009) recognized teacher research for its’ “potential to expand beyond the classroom and school walls and serve as catalysts, as inspiration for change and transformation for more humane and culturally responsive educational practices” (p. 51).
Written nearly two decades ago to help educators better understand research practices, Cochran-Smith and Lytle’s book, *Inside – Outside: Teacher Research and Knowledge* (1993), continues to be both luminary and massively prominent in the field of teacher research. Although Cochran-Smith and Lytle agree with the general tenet that teacher research is systematic, intentional inquiry undertaken by teachers in their own school environments and typically related to a specific aspect of their current classroom practice, they implore educators to not value this research, “simply as heuristic for the individual teacher” (p. 25).

In my opinion, this is particularly important in today’s teaching climate as many teachers are becoming increasingly involved in making connections to share and learn from peers and other teaching professionals in order to inform and improve upon their teaching practices. On a personal level, I feel that the work that I am engaging my primary learners in by using the Question Formulation Technique™ to enhance their inquiry learning experiences will be of interest and benefit to other teachers who are interested in inquiry-based teaching and learning.

Much of the work that John Barell has done with and for teachers, in the interest of promoting inquiry and project-based learning to become common and best practice in schools, aligns entirely with my personal stance on inquiry learning and teaching. In his book, *Why Are All School Buses Always Yellow?* (2008), I unequivocally share Barell’s belief that inquiry learning and in particular student questioning is relevant and very possible with all learners regardless of grade level if they are provided with the right opportunities. Doug Selwyn (2008) reinforces this perspective and validates the very nature of my project and more importantly the work I am doing with my students with his strong opinion that inquiry “works for learners of all ages whether they are young learners in a primary classroom or they are Grad students conducting research for their thesis work” (p. 46).
Barell (2008) asks two critical questions that closely reflect the overall goal of the work that I am doing with my students in helping them to become more independent thinkers and learners. He wonders, “under what circumstances should we stress students’ becoming more aware of their own responsibilities in taking control of their own learning?” and further “to what extent can our younger students participate in this quest for personal control?” (p. 132).

With these two questions in mind, the metacognitive awareness and abilities of my students have been supported and enhanced through the use of a goal-setting unit introduced at the beginning of the school year. The essential objective for this unit is to help the students develop their ability to understand and work around the guiding question, “What tools and skills do I need as a learner to be successful now and in or for the future?”, an understanding that should impact their learning henceforth.

In order to effectively approach this review of literature by looking at some of the research elements found in these resourceful materials as well as the perspectives of many contemporary visionaries in the greater field of education, all of whom support the social and intellectual growth of the inquiry learner, I felt that it was incumbent on me as a responsible research practitioner to investigate and clarify for myself the educational perspective that views the students’ needs as paramount to the success of both the student and the educator responsible for providing the enriched learning opportunities within which the student can ultimately flourish.

At the end of the previous school year, when I posed the simple albeit inherently complex question, “What is inquiry?” to my group of young primary learners, I was not quite sure what to expect in their responses. It is true that these young and curious students had been engaged within the structures of inquiry learning for the previous two years, yet I still questioned whether they would
have the ability to articulate or express their understandings in terms of why they were being asked to learn in a seemingly non-traditional way. To my pleasant surprise, the students provided the following insightful comments:

- when you look into a subject, you’re working to find out facts
- asking questions and finding things out
- inquiry is when you wonder about questions
- you are trying to figure out 1 big question
- you learn about what you’re doing and put it into a big binder (IB portfolio)
- asking questions and finding answers
- if someone asks a question and no one knows the answer, you’re supposed to research it
- if you don’t come up with answers quickly, you can guess what it is then research to find out the answers after
- when you don’t know an answer to a question, you can ask someone (like a parent, Scientist, teacher, friend, older students).

In considering these thoughtful and astute responses, I immediately began to wonder what it was exactly that we had been doing in our teaching over the course of these past few years that enabled these learners to talk a talk that clearly represented and supported the inquiry journey that we have been walking with them. In other words, what were the very conditions that were being put into place to foster the ideal and optimal learning opportunities for our students, and, perhaps even more importantly, how could we continue to build on this very infrastructure to ensure the on-going growth and success of our burgeoning learning environment?

**Inquiry Learning – Tell me or show me how and I will do it**

This same question, “What is inquiry?”, has been pondered for many years by members of the bigger educational realm in an attempt to validate and promote inquiry-based teaching and learning as a prominent force in educating learners. In essence, inquiry has most frequently been summed up in very simple terms as the *asking and answering of questions*. 
In the British Columbia Ministry of Education English language arts integrated resource package for Kindergarten to Grade 7 students (2006), the inquiry approach is described as “the asking of thoughtful questions”, wherein teachers help students to, “pose questions and design tasks for seeking answers to their questions” (p. 18). Although I agree with this statement and, in fact, can assure myself that this is very much the reality of my own teaching practice on a daily basis, I am still left wondering how these processes could be made more transparent for others to learn from.

Jeffrey D. Wilhelm asserts in his book, Engaging Readers & Writers with Inquiry: Promoting Deep Understandings in Language Arts and the Content Areas with Guiding Questions (2007), that in order to teach students how to inquire we as teachers must, “induct them into a new community of practice”, and that they must be taught, “both how to inquire and how to take on the identity of a particular kind of inquirer” (p. 26).

It is the latter part of his perspective that resonated with me as we continued in our attempts to define what inquiry looks, sounds and feels like with our young primary learners. In my opinion, as teachers, we have been providing opportunities for and modeling the ways for our students to become more familiar with their awareness of ‘how to inquire’; yet, at the same time, we were possibly remiss in our responsibility to provide these receptive learners with the very skills that would cultivate the ‘identity’ that Wilhelm (2007) speaks of. Ultimately, this awareness would enable our students to assume increasing responsibility for their learning.

Kathy Short of the University of Arizona is an educator who has been involved in helping to define the boundaries of inquiry-based learning and teaching since she began her teaching career in the 1980’s. Recently, she contributed her perspectives in a book written through the lens of the International Baccalaureate Primary Years Programme whose mandate since its inception in 1997 has
been to work with its educators to underline the best contemporary practices, and to find ways for teachers to implement them in their settings.

In her chapter that she contributed to this publication entitled, *Inquiry as a stance on curriculum*, Short (2009) begins by stating very frankly the simple notion that inquiry learning is about having students ask questions and subsequently engage in research to answer these questions, in fact, in her opinion, “violates the deep structures of inquiry” (p. 11).

In other words, we cannot merely say to a learner at any age, ‘figure it out’ and inquire. If we consider the perspectives of both Wilhelm (2007) and Short (2009), successful inquiry teaching and learning involves modeling and shaping of specific skills, and providing students with practical learning engagements to hone a skill set that will ultimately enable them to approach a broader range of learning opportunities.

To this very end, in an article that he wrote to define the importance of inquiry learning in science education, Alan Colburn (2000), makes a clear distinction between learning opportunities that are “too challenging” for students and those that stimulate the cognitive levels of the learners wherein maximal learning occurs. In his estimation, Colburn feels that this is best achieved when the learning engagements or activities are just-right; that is, they are “cognitively challenging but still doable” (p. 43).

Clearly prescribing to the basis of Lev Vygotsky’s *Zone of proximal development*, it is this very tension and academic challenge, something that we have systemically and intentionally built into our inquiry program at Sequoia Park Primary, that will enable our students to accept and meet any new challenges asked of them, particularly that of becoming better question posers and independent *researchers* of knowledge. Vygotsky (1986) himself believed that this formal and
conceptual knowledge emerges from a repertoire of daily experience and interaction with adults and peers.

In attempting to differentiate between various forms of inquiry to inform teachers how to best structure learning engagements that will inherently support the students’ growth and development as inquirers, Colburn (2000) highlights three forms commonly referred to as structured (students are provided with a question and method to explore it), guided (students are provided with a question then work with the teacher to come up with a method to test it), and, finally, open (students independently generate their own questions and determine the methods to investigate it) inquiry, each of which, in his opinion, empower the student to “take ownership of the concept by applying it in a different context” (p. 42).

Regardless of the form of inquiry the students are engaged in, Kathy Short (2009) views the learning as a “collaborative process of connecting to and reaching beyond current understandings significant to learners” (p. 12). Further, she asserts that it is a stance that “combines uncertainty and invitation” (p. 12). It is after all, in her words, one’s ability to think with others that provides the “impetus and zone of safety from which to reach out” (p. 13).

Furthermore, for learners to successfully engage in any of the three forms of inquiry that Colburn refers to, Short firmly believes that a curriculum that embodies an inquiry as stance approach is best realized through the use of a clearly defined and articulated curricular framework that, “provides the bigger picture, particularly highlighting the relationships between the parts, so that we can more effectively work at those parts within the whole” (Short, 2009, p. 18).

Figure 1 on page 25, a visual representation of Short’s Authoring or Inquiry Cycle, which she describes in detail in her chapter (Short, 2009), delineates the various stages that she feels should be present at some time in an engaged inquiry classroom. Together with two PYP colleagues,
I helped to create this visual in a way that would help clarify the elements of the inquiry process for both the teachers and the students in our school environment.

![Inquiry Learning Cycle Diagram](image)

Figure 1 (Based on Short’s Authoring/Inquiry Cycle by Riley, Elves, Ross, 2008)

**Inquiry Learning – It’s better if I (the student) ask the questions**

Thinking back to the powerful statements made by my teacher colleagues regarding the questioning skills of our students and how we might be able to minimize the number of teacher questions that guide the inquiry experiences that we create, it is my belief that in order to achieve this, it is imperative that students are asking the initial questions as opposed to responding to those predetermined by the teacher.

Short (2009) describes the notion of inquiry as “problem-posing” and “problem solving”; a process in which, “the teacher sets up a situation to pose an engaging problem as a means of encouraging students to ask questions about that problem and to research those questions” (p. 15). In an article that she co-wrote previously, Kathy Short (Short & Burke, 1996) suggests that this can only
be realized when there is a “change in beliefs, not just in practice” (p. 102). In other words, teachers must view teaching and learning as a symbiotic relationship of “building and negotiating curriculum with students” (Short & Burke, 1996, p. 102); and further, inquiry questions should not be constructed ahead of time by teachers as curriculum experts, but rather, it is of critical importance that, “students be part of creating the questions” (p. 102).

Although I have attempted, in my previous years of teaching from an inquiry stance, to create this very paradigm in the classroom by providing my students with many activities and experiences through a wide variety of units of inquiry, both their motivation along with their ability to ask questions at any point throughout the learning process has been, in my opinion, both inconsistent and often minimal. It is my opinion that both these elements can be improved upon dramatically simply by addressing and improving upon the students’ abilities to ask the questions that both initiate and sustain the learning engagements.

Casey Lyn Sterle (2008), a public school elementary teacher in Michigan, has previously experienced these very struggles with her primary learners. To address her concerns, Sterle participated directly in a research initiative with the University of Michigan Problem-based Learning Project for Teachers. Subsequently, she wrote an article published in the Michigan Science Teachers Association Journal (MSTA Spring 2008) in which she describes how she set out to examine the ability of her primary students to “generate appropriate questions related to their observations and use information they receive to formulate conclusions about the problems they encounter” (p. 22).

Sterle used video recordings of her students in order to determine what was working and, more critically, what needed to be changed in terms of her students’ abilities to ask questions, analyze for
possible answers, build another question and formulate a conclusion. Not unlike my experience, Sterle quickly realized that her students were not engaged in the lessons and further they clearly lacked in their questioning behaviours overall. Moreover, she quickly realized that if something were going to change, it would have to start with her own stance on learning and how she was presenting the learning experiences to her young students.

Part of her reflection helped Sterle (2008) to realize that she “had not yet given them the tools with which to approach or solve the problem” (p. 23). Together with her colleagues, Sterle came up with a series of lessons that could be used to teach and reinforce the students’ abilities to ask questions, analyze the answers and formulate conclusions. Among many benefits that this shift in teaching provided for their entire learning community, Sterle noted that when, “children understand how to ask questions to find the answers about things that interest them, they will continue to use questioning in all forms of their investigations in life and they will begin to question in every part of the curriculum” (p. 23).

John Barell (2008) contends that, in order to achieve this level of inquiry experience for learners, it is necessary from day one of a specific learning journey (unit of inquiry for example) to “build a firm emotional, social and intellectual structure where students questions play a more significant role” (p. 15). To this end, it is my intention to incorporate student questioning as a means of enhancing student engagement and motivation as well as activating prior knowledge from the outset of a particular unit of inquiry. That way, as the students acquire specific language, concepts and skills throughout the course of their learning, they will be able to refer back and make deeper connections to their initial questions. Moreover, these questions will help them to build on their current levels of understanding and to promote further questioning.
Adriana Lores Gonzales (2010) is an elementary school teacher who was in very much the same predicament I found myself in as I considered the course of my own work for this project. Working in an IB PYP school, Lores Gonzales is expected to implement an inquiry approach with her students, an approach she describes as a “process initiated by the learner or the teacher which moves the learner from his or her current level of understanding to a new and deeper one” (p. 53). Like myself, Lores Gonzales was facing many of the same questions with respect to the approach she was using with her learners. As she reflected mindfully on her inquiry teaching practices, she quickly noticed that, although students in an inquiry setting are or should be required, with guidance, to direct their own learning, the students in her setting were “not able to take responsibility of their learning” (p. 53). A second shortcoming, in her estimation, that was limiting the growth of her teaching and the students’ learning was that she was not providing them with a specific set of skills that would enable them to negotiate or “work independently through a series of difficulties” (p. 53). Too frequently, she noticed that when faced with a problem or challenge, the students were dependent on her to resolve any issues or difficulties rather than independently “seeking explanations or alternatives” (p. 53).

Lores Gonzales (2010) decided to further examine these issues in the form of a research project that she conducted with her class of grade six students over the course of 4-month period during a series of English lessons. During this time, she initially looked at the nature of the inquiry methodology currently being used with her students and how it impacted on the both her teaching as well as the learning experiences of the students. Referring to herself as the dispenser of knowledge, Lores Gonzales quickly determined that the learning environment was primarily focused around her being the expert, and that somehow she must endeavor to create a more student-centered environment that would, in her words, “create the best environment for students to have an active role in the construction of their knowledge” (p. 54).
To begin her research study, Lores Gonzales explored whether her own questioning skills were sufficient enough to support the inquiry learning of her students. In her pursuit to clarify this, Lores Gonzales determined that not only was she asking too many questions, but also the very nature of the questions she was presenting to her learners was misguided. She felt that the questions were gauged to determine what the students already knew, and that they limited the students’ ability and/or flexibility to investigate further into them.

A second element of Lores Gonzales’ research that closely paralleled my situation was that of the nature of the questions asked or being used in class. In my experience, the teacher has primarily generated the majority of the questions both asked and used within our units of inquiry. I continued to ask myself what must be done to shift this. In other words, how could we promote more student questioning, and would this, in fact, have an impact on the students’ motivation and acquisition of knowledge? Lores Gonzales went straight to the source and surveyed the students themselves to find out their perceptions on questioning and how they are nurtured in the classroom environment. Similar to past research, Lores Gonzales (2010) concluded two very telling points about the impact of questioning: the first being that, “the teacher questions set out to determine what the students know through recall of specific information or facts”, and the second being that, “student questions typically serve to clarify a specific need or to answer something about the content within a lesson” (p. 55). Following her lead, I felt that it would be very insightful to implement a similar type of assessment (see Appendix A) with my students to be more aware of how they viewed the importance of questioning within the paradigm of the learning process. Additionally, this information would be helpful to determine where to place the emphasis when I began to implement the Question Formulation Technique™ with my students.

Doug Selwyn (2010), an associate professor of education at Plattsburgh State University in
Upstate New York and a former public school teacher himself, continues to believe that the vast majority of people, including students at all levels within the education system have been trained “not to think, not to question” (p. 2). To investigate how we might, as educators and leaders of young minds, equip learners with the skills, knowledge and dispositions that will allow them to become more proficient 21st century learners, Selwyn interviewed several researchers to explore the ways in which they conduct their research by asking and pursuing relevant questions. Selwyn relied on the direct experiences of a number of classroom teachers, both at elementary and secondary, to highlight how these progressive educators are helping students become critical thinkers and researchers themselves.

Despite the fact that we can talk about ways to educate students to best prepare them to function as responsible adults - the very edict of the 21st century learner - Selwyn (2010) continues to avow that too many schools are “increasingly operating in ways that guarantee these goals will not be reached” (p. 7). Selwyn holds the firm belief that too often students “do not become competent in a wide range of subjects through a narrowing of curriculum” (p. 7), nor do they, “learn to think, to solve problems, to reason, to apply knowledge, or to write and communicate effectively in many of today’s classrooms” (p. 8).

Something that I have consistently noticed with the students in my primary classes in the past has been that although they participated happily and actively in the learning engagements I offered to them, they were not able to take the desired control of or for their learning. Moreover, they too often relied on my direction or they waited for or expected help when presented with a problem instead of showing a willingness to seek other explanations or further question elements they were not comfortable with or even disagreed with. Ultimately, I was forced to reflect more deeply into my own choices and consider more effective ways to improve my teaching in order to offer more meaningful
and powerful ways of learning for the students. The only difference between what I was envisioning to enhance the learning experiences for my students compared to what has been previously considered by others like Casey Lyn Sterle (2008), Adriana Lores Gonzales (2010), or those teachers and educators with whom Doug Selwyn deliberated (2010), was quite simply the notion that students must play a more significant role in crafting the initial questions that ultimately shape and guide further learning. It is my firm belief that Rothstein and Santana’s Question Formulation Technique™ (2011) will help to achieve this very end for not only the primary learners in my care, but equally for learners of all ages in a variety of learning contexts.

**Inquiry Learning – Let me do the thinking (metacognition)**

One of the biggest challenges of inquiry-based learning with students at all levels, in my opinion, falls within the area of metacognition. Metacognition is widely seen as the ability to think about thinking (cognition), and, further the ability to know when and how to use certain strategies that will ultimately help students navigate their learning journeys with increased independence, confidence and understanding (regulation). Both of these processes, I would argue, will be paramount in honing the skills and aptitudes of the 21st century learner.

Benjamin Bloom (1956) originally devised his taxonomy of educational objectives in an attempt to help educators who were, at that time, struggling to determine how students should best learn. Regardless of the perspective held by a specific teacher, Bloom felt that the classifications within his taxonomy would serve to “facilitate the exchange of information about their curricular developments and evaluation devices” (p. 1). In the spirit of a natural inquirer, Bloom implored teachers to consider their perspectives by asking the question, “what does a student do who ‘really understands’ which he does not do when he does not understand?” (p. 1).
For me, it is this question that lies at the heart of the inquiry process; one that will ultimately empower learners to pursue their thinking and questioning, and, moreover, to delve deeper to clarify understandings and to construct knowledge, particularly during times of struggle or frustration.

As a primary teacher, I often reinforce to my students that they are being highly principled and independent learners when they are aware of and are able to demonstrate desired behaviours naturally and on their own. The same can be said for the development or increase of knowledge. That is, much of this growth will be realized when the students are no longer dependent on the teacher to prompt or remind them to perform these skills, but rather they become systematically a part of who they are and what they do pervasively as curious and mindful learners, both in a school setting or in their lives in general.

In their book, *Making Thinking Visible* (Ritchart, Church & Morrison, 2011), the authors offer a list of six thinking skills that Ron Ritchart himself had previously identified with a group of colleagues. The authors feel that the following skills will essentially provide learners with a framework in the development of understanding, ultimately making thinking more ‘valued and visible in classrooms’ (p. 12):

- Observing closely and describing what’s there
- Building explanations and interpretations
- Resolving with evidence
- Making connections
- Considering different viewpoints and perspectives
- Capturing the heart and forming conclusions (p. 11)

As I work to make these thinking skills more transparent in the actions of my young, primary learners, I unequivocally share the perspective that by helping students to become more independent as learners, as thinkers, they become more, ‘capable of directing and managing their own cognitive actions’ (Ritchart, Church & Morrison, 2011, p. 22).
Chapter Three: Procedures and Methods

Action Research can be defined as,

“any systematic inquiry conducted by teacher researchers, principals, counselors, or other stakeholders in the teaching/learning environment to gather information about how their particular schools operate, how they teach, and how well their students learn” (Mills, 2011, p. 5).

Research Format and Design

Considering this definition, I have chosen action research as the most suitable methodological framework for this study. Along with the extensive framework laid out methodically by Geoffrey Mills (2011), there is an exorbitant list of other researchers who have deliberated over the nature and effectiveness of teacher as researcher and its impact on student learning over the years. Two recent studies (Cochran-Smith, Barnatt, Friedman & Pine, 2009; Souto-Manning, 2009) reinforce the notion that teacher research must be conducted in a way that ultimately leads to improvement in both teacher practice and student learning.

Cochran-Smith et al. (2009), who worked directly with a group of teacher-education practitioner researchers to determine the effectiveness of conducting classroom inquiry focused on student learning outcomes, assert that teacher action research is intentional inquiry by teachers investigating relevant and meaningful issues in their own schools and specifically in their own classrooms, and that these efforts should ultimately lead teachers to “become lifelong learners who raise questions and continuously learn how to teach by researching and reflecting on practice across the professional life span” (p. 17).

In the article that she wrote to substantiate the need for empirical teacher research as a means for improving educational practices in classrooms, Mariana Souto-Manning (2009) talks about the idea
that teachers are engaged in what she calls responsive teaching on a continuous basis. That is, they are constantly reflecting on ways to improve their practice; in fact, it is her opinion that there does not exist a noticeable difference between these teachers and other teachers who are involved in research or action-research projects in their classrooms. To this end, Souto-Manning (2009) states that, “the difference between teachers searching and teachers researching lies in the systemization and purpose of the process and the reliance of the data” (p. 49).

The intention of the action research for this project was to gauge the questioning skills and abilities of young primary learners, and whether we as teachers are properly facilitating this growth process in order to maximize the inquiry learning experiences for these students. Mills (2011) describes that teacher researchers who engage in practical action research are better equipped to, “examine the dynamics of their classrooms, ponder the actions and interactions of students, validate and challenge existing practices, and take risks in the process” (p. 9); something that I would argue we are asking more and more of students in classrooms as we challenge them to assume increasing responsibility for their learning.

Mills (2011, p. 9) further delineates five key concepts that support these basic elements for the process of action research. As a relatively inexperienced teacher researcher, I was able to draw extensively from these concepts for this study, which are outlined in figure 2 below:

![Figure 2 – Components of a Practical Perspective of Action Research (Mills, 2011)]
The primary undertaking of my study was to introduce the students in my class to the Question Formulation Technique (QFT™). Ultimately, I would endeavour to determine whether teaching young primary learners a cognitive and concise framework would help them to “produce their own questions, improve their questions, prioritize them and lay out some next steps for how they would be used” (Rothstein & Santana, 2011, p. 3).

Besides my role as classroom teacher, I enjoy the benefit of working closely with each of the members on our teaching staff in my role as Coordinator for our IB Primary Years Programme. Together, we have worked diligently over the past few years to look for opportunities for professional development to support our growth as an inquiry-minded school. As a school staff, we have made many significant gains in the area of concept-based learning that ultimately enabled our entire school community to solidify our stance on inquiry as an effective philosophical, curricular and pedagogical approach to learning and teaching.

Rather fortuitously, it was during one of our many whole staff conversations that led me to pursue the focus of this study, when two of my colleagues offered the following rhetorical statements/questions:

“I really believe that teaching the art of good questioning is a powerful teaching tool that ultimately leads to more meaningful learning. I’m just not exactly sure how to achieve this for our young learners without doing too much for them”.

- Early primary teacher

“How do we move away from prompting or providing too many teacher questions, and find a way to teach the students to come up with and ask questions more naturally?”

- Teacher librarian
Like many of my teacher colleagues, the notion of making wholesale changes to my teaching practices is all too often daunting and provides little security for those of us directly responsible for affecting change within a system. In my opinion, this may help to explain the reluctance of many educators to firmly embrace the many attempts to revolutionize teaching from the school level up to the national level of educational reform. However, I firmly believe that the opportunity to explore the topic of student questioning through this action research project will not only be paramount in helping to make believers of reluctant educators, but more importantly, it will help to redefine the notion of wholesale changes. Dan Rothstein and Luz Santana’s single assertion to Make Just One Change has the potential, in fact, to promote systemic changes that can definitely affect everything and everyone, and will be done with absolute concern for the results.

School and Community Context

Sequoia Park Primary School is one of fourteen elementary schools (and three secondary schools) that comprise a relatively small and progressive school district located in an affluent district municipality in the province of British Columbia. As a small primary school, Sequoia Park has a modest population of 64 students in Kindergarten through Grade 3. In September 2011, Sequoia Park Primary received full authorization as an International Baccalaureate (IB) World School mandated to provide a comprehensive educational program based in principle on the IB Primary Years Programme (PYP) in combination with the prescribed learning outcomes (PLO’s) described in the British Columbia Ministry of Education’s Integrated Resource Packages (IRP’s) at the elementary (primary) level. The PYP is designed for students aged 3 to 12 with a primary focus on the development of the whole child as an inquirer, pervasively in the classroom and in the world outside.
The professional staff at Sequoia Park is comprised of relatively experienced (IB) classroom teachers, each with a minimum of five years working in the school or in the district. Two of the teachers, including myself, have six and seven years experience working in two different IB World Schools (both located in the same Metro School District) as well as between two and four years serving as the school’s appointed IB Coordinator for student learning and programming. Moreover, any teacher on staff with continuing contract status receives IB training on a biennial basis, which is considered a critical component for teacher professional growth as well as student success.

Besides the classroom teachers, the staff at Sequoia Park is further comprised of three part-time and non-enrolling teachers, including a learning resource teacher, a Music specialist and a French language specialist all of whom work closely with the teaching staff to provide a balanced curriculum and academic program for the students.

In my class of keen and enthusiastic grade two learners, I had 17 students, including eight girls and nine boys. 16 of the 17 students had been at Sequoia Park since Kindergarten and were therefore very familiar with the expectations for learning that come with the IB program, including the curricular structure and specific elements of language associated with the program. It must also be noted that the 17th student, who transferred into our classroom at the beginning of grade two, adjusted very quickly to the routines and expectations for learning that, according to his parents, “differed significantly from his previous school environment”.

The learning conditions at Sequoia Park Primary presented the ideal opportunity and situation to undertake the very nature of this study. This being the case, it is also my opinion that the potential benefits of raising these young learners’ awareness of both the art and science of questioning can be far-reaching, well beyond the walls of a single primary classroom.
Instruments and Procedures

Although I utilized some basic quantitative measures to look at the number and nature of questions being asked during specific lessons taught, the majority of information collected throughout this study was of a qualitative nature. The qualitative measures used included data collection in the form of recorded comments, questions and observations made by students during lessons (including those lessons where the QFT™ was being implemented and taught as well as those from subsequent lessons or inquiry activities that resulted from the initial lessons), recorded comments, questions and observations from the three questions on the guiding questions form for students (Appendix A), as well as written and transcribed comments and observations provided by both parent and staff participants (Appendices B and C respectively).

In terms of the qualitative measures for data collection, I was able to gather a wealth of practical and relevant information using questionnaires as well as by recording comments, questions and perspectives of the students during specific lessons and at other times when relevant thoughts or further questions came up throughout the learning process (both part of my normal classroom routine).

The student responses generated from the guiding questions (Appendix A), which were collected in class over the course of two separate lessons, allowed me to gauge the students’ current understanding for asking questions. Each lesson consisted of a different question prompt, “Why do we ask questions?”, “Are all questions the same?” and “How are questions the same or different?” Although, the students’ comments would ultimately be transcribed and would appear anonymously, and with their parents’ approval, I wrote down each of the student’s ideas verbatim on chart paper with their initials jotted down beside their comments (in the past, I have found this a very useful practice to help empower the students and to encourage all others to participate, as young learners find it very exciting to see and hear their names with respect to their learning). Finally, using the same
format, I asked the same three questions to the students again towards the end of the study, then
compared and contrasted the contributions to further substantiate how the students see themselves as
learners, as inquirers (Tables 1 and 2 on pages 68 and 69).

The questionnaire for staff participants (Appendix C) was distributed to the teaching staffs at
both Sequoia Park Primary and Maybank Elementary, both of which are IB World Schools
responsible for delivering an academic program based on inquiry-based teaching and learning. For
the benefit of this study and in the best interest of the learners, I felt that it would be beneficial to
glean the perspectives of colleagues at both school sites as the majority of the students currently
enrolled at Sequoia Park will continue in the IB Programme at Maybank once they complete grade
three. Therefore, it was helpful to have an understanding of both the perspectives and the
expectations of these colleagues in order to better support the learning conditions for our students.

The voluntary questionnaire, which was sent to colleagues in early January 2013, asked three
questions to explore the nature of student questioning by looking at the ways that their questioning
skills grow and change as well as the ways that our skills, as teachers, in guiding student questioning
grow and change, and, finally, to determine others’ perspectives on the need or demand for a specific
framework/protocol for teaching student questioning and how it might impact student learning. It was
my opinion and belief that this information would ultimately help to better define and guide our
professional learning needs that would be equally useful in shaping the learning opportunities for both
the teachers and the learners.

I used Powell and Renner’s (2003) T-table format to demarcate the common themes among
the colleague responses (Table 4 on pages 75 and 76). My goal, as the researcher, was to use this
information to: 1. Acknowledge and validate the volume of work that we already do to support the
needs of our learners; and 2. Establish a need for and consider possible strategies to develop new ways to support and enhance the growth of these learners.

The anonymous and voluntary questionnaire (Appendix B) that was sent to parents in early February enabled me to gauge the home perspective with respect to any growth in the children’s learning behaviours over the course of the school year. This was achieved in the questionnaire by asking the following two questions: 1.) Describe any changes or general observations you have noticed about your child’s QUESTIONING skills over the past few months; and 2.) In your opinion, how do you feel questioning can help your child in his/her learning and/or daily life? Overall, my intention was to analyze their highly insightful comments to look for themes that reflected both questioning behaviours and engagement/motivation as well as their perspectives on the value or role that they feel questioning can have for their children. Of the 17 families who received the questionnaires, I received eight responses for each of the two questions.

These responses were analyzed, coded and organized into common themes using a T-table (see Table 3, pages 72 and 73) format similar to that described by Ellen Taylor Powell and Marcus Renner in their paper, Understanding Qualitative Data (2003), I began the process by looking closely at the information to determine common themes that would aid in organizing the parent responses into specific categories to better analyze and interpret their perspectives. As opposed to simply generalizing across the comments provided, my goal, as the researcher, was to interpret and categorize the information to seek insight and to look for similarities and/or differences that would serve to reinforce the work that the students had accomplished throughout this rigorous process.

Validity and Challenges

In terms of the student voices reflected in the data gathered throughout the course of this study, both from the lessons where the Question Formulation Technique™ was taught and practiced as well
as from the lessons pertaining to the student questionnaire (Appendix A), the students’ comments, questions and observations were transcribed verbatim, thus assuring absolute validity. Although this was and continues to be part of my classroom routine, this was clearly expected as expressed in Rothstein and Santana’s (2011) third of four rules for producing questions demanding that we write down every question exactly as it was stated. The objective nature of the students’ contributions was consistently maintained throughout the course of this action research project, including the point at which the school’s Administrative Assistant thoroughly and accurately transcribed their ideas and perspectives. All language remained exactly as it was stated or written by the individual children, including incorrect grammar and/or spelling, with the exception of their names which were replaced by the terms ‘student 1’, ‘student 2’, etc. for each individual student. These numerical indicators remained consistent to each student throughout the various activities (i.e. student 1 was always assigned to the same student).

With respect to the parent and staff participants who willingly contributed their perspectives by submitting their completed questionnaires, the validity of this data and information was dependent on the objective and truthful nature of their responses. Although I did not anticipate that either the parents or the staff would have difficulty providing relevant information to reflect the questions, I still encouraged them in our conversations to provide any level of comment or feedback that they felt best reflected the nature of the questions. Furthermore, it was clearly indicated on the questionnaires that by no means were they obligated to answer any or all of the questions and with no explanation required.

Throughout the course of the study, I was fortunate not to face many challenges that restricted my ability to undertake any of the actions in this project. Nevertheless, there were some situations that required attention on my part to ensure that I would be able to achieve my goals with the least
amount of bias or that would minimize any potential influence on my part.

At the beginning, of the project, one of my primary challenges was to determine how I could balance my role as both teacher researcher and classroom teacher as I was directly involving the students in my class in this study. I was able to rationalize that the very nature of my study could be accomplished outside of the realm of teacher research. That is, the relevancy of the focus within the study could have been equally achieved as part of my regular teaching routines as a teacher practitioner. A second element of challenge with the students was to somehow ensure the least amount of influence I had over their contributions. I had to determine an action plan that would enable me to consciously remind myself not to put words in their mouths. I quickly realized that the protocol for the Question Formulation Technique™ would allow me to achieve this exact end. This is directly reflected in the second and third rules for producing questions as outlined by Rothstein and Santana (2011): do not stop to discuss, judge, or answer any of the questions and write down every question exactly as it was stated.

As a teacher, this ongoing analysis enabled me to make immediate and on-going adjustments and improvements to the nature of teaching and learning throughout this process. I was able to determine areas of consistency for students at the same time as determining other areas that required further attention. In the role of researcher, my intention was to use this information and these insights to substantiate or define the learning needs and behaviours for students that would allow them to be increasingly successful as thinkers, as inquirers.
Chapter Four: Findings and Results

The Student Voice: Introduction to the QFT™

Fast-forward to the point where I was prepared to begin the process of introducing the QFT™ to my students. To be fair to these curious and keen grade two learners, I had provided some previous scaffolding without letting them know to what end it might support their development with this new and exciting protocol.

This process included four different lessons in which I asked the guiding questions outlined in Appendix A; one lesson in which I asked the question, “Why do we ask questions?”; a second lesson in which I asked the two questions “Are all questions the same?” and “How are questions the same or different?”; a third lesson during which I implemented a modified version of the QFT™ without a formal introduction, as well as a fourth lesson in which I asked the students to brainstorm as many question words as they could. As detailed in the Instruments and Procedures section in Chapter 3, I

Figure 3 – The QFT™ Process

Figure 4 – The QFT™ Rules
would also re-administer the first and second lessons, described above, towards the end of the school year using the same three questions in order to compare and contrast how the students see themselves as learners, as inquirers.

In the first lesson towards the beginning of the school year, I began with the question, “Why do we ask questions?” and simply invited any thoughts or observations from the students. Here were their offerings:

- So you get smarter and smarter, and you’re full of ideas (student 14)
- If we don’t understand something, you have to ask questions to understand it (student 5)
- To help us learn (students 8, 3 and 2), and to learn more (student 16)
- So that we can answer them to find out like, ‘How many bones in the body?’ (student 7)
- If you don’t know something, you can ask someone like, ‘What is your name?’ (student 6)
- Without questions, it would be much harder to learn stuff (student 2)
- When you ask questions, you learn more and stay safer (student 15)
- So people can tell you how things work like, ‘How do clouds move?’ (student 1)
- If we don’t ask questions, then we can’t think of anything (student 13)
- If we don’t ask questions, we won’t be smart enough to be an IB student (student 5)

It is evident from their responses that these students have a general yet developing understanding or perspective of and for inquiry learning, and more specifically an awareness of the role that asking questions plays in the learning process. This comes as no surprise however as 16 of the 17 students had been exposed to the importance of using questioning in their learning since kindergarten. Therefore, it was my hope that by using the protocol in the QFT™, the students would rely less on the teacher questions to lead them through their learning experiences and that they would begin to ask the powerful questions to engage, motivate and empower them to take command of their learning.

By looking at their responses to look for common themes, the students tended to agree that asking questions would ultimately help them to learn and to become smarter. A second element
that I noted in the students’ responses was the fact that no less than three included specific examples
of questions to back up their thinking. In my opinion, this could have been the result of the fact that
we often ask the students to explain their thinking or to give examples to help show their thinking. It
should also be noted that ten of the 17 students in the class contributed ideas with only three students
making two contributions.

This discerning lesson was followed up a few days later when, during the second lesson, I
asked the two questions, “Are all questions the same?” and “How are questions the same or
different?” to which the students provided the following insightful ideas:

• No, because everyone thinks of different questions (student 2)
• Also because everyone just thinks different (student 13)
• No, because we have our own brains to come up with our own questions (student 15)
• No, because people are curious about different things (student 3)
• No, because you ask different things like ‘can I have a drink?’ or ‘how do you spell circus?’ (student 7)
• Well yes sort of because they are all questions (student 9)
• Some are the same, they’re just worded differently (student 1)
• They might have different words in them but they still need an answer (student 9)
• They are the same sometimes because they always have a question mark at the end (student 16)

To honour the rules for administering the QFT™ (figure 4 on page 43), and in particular rule
2, I resisted stopping to discuss any of the contributions; I simply thanked the students for their ideas
and explained to them that we would be revisiting these two questions along with the question from
the first lesson towards the end of the school year to compare and contrast their thoughts. When I
asked them why they thought this might be important or how it could help us, they all agreed with
student 1’s notion that “it will show us how much new things we learned”.

By looking at the responses to the three questions, I felt that the students were equipped with a
reasonable understanding of the importance of questioning, so I decided to unofficially try out the
QFT™ with the students by inviting them to consider the following question focus (Qfocus), “Asking questions feeds our brains”.

Without giving the students any details of the process, including the name or how it worked, I simply told them that their job would be to come up with any questions that would help them to better understand the statement written on chart paper. To begin, I asked the students to read the Qfocus over with me and to decide on the key words that would help us to better understand the meaning of the statement. Using a highlighter pen, I emphasized the following words that they chose, “Asking questions feeds our brains”. The students had been previously well versed in this strategy as a means of supporting their developing literacy skills. At this point, I invited the students to begin asking questions. To my pleasant surprise and with no prompting, they came up with the following five questions that I wrote down as part of a web on the chart paper, including writing the initials of the person who contributed the question:

- What does it mean? (student 4)
- How is it going to work? (student 5)
- How does it actually feed our brains? (student 13)
- Why does it feed our brains? (student 1)
- How does it help us learn? (student 3)

Having come up with the five questions, I again thanked the students and asked them if they had any further questions to add to the web. The comfortable silence indicated to me that they were satisfied with the questions on the paper. Although I let the students know that we would certainly have the opportunity to discuss these questions at a later time, I wanted them to think about the nature of these questions and decide whether they felt they were BIG questions, that is questions that need more time or information to answer, or quick questions, that is questions that could be easily answered
in a few words. These two concepts relate directly to the third component of the QFT™ where students are asked to differentiate between open- and closed-ended questions.

Rothstein and Santana (2011) define a close-ended question as one that can be “answered with a one-word response such as yes or no or another single word”, whereas an open-ended question is one that “requires more explanation” (p. 75). To minimize any unnecessary confusion, I chose to maintain the terms BIG and quick throughout the course of this study.

Finally, before I officially introduced the students to the essential elements of the QFT™, I decided to review and gauge their knowledge of words that are used to begin questions, or question words. During a previous lesson not directly related to this study, I had asked the students, “How do we ask questions?” Among the six ideas that the students came up with, one suggestion was that “we use question words at the start, like how”. Once again, I was very pleased with the variety of words (19 in total) they produced in a short period of time: when, where, will, how, if, who, have, what, does, really, can, I wonder, do, are, is, why, would, could, should. From this relatively exhaustive list, generated independently by a small group of six- and seven-year-old learners, it was clear to me that they were more than ready and prepared to become more proficient questions posers and inquirers.

One of the key observations that I made in each of these previous four lessons was that in spite of the fact that these students were, in fact, young primary learners, they were still able to demonstrate extremely high level and acute listening skills. This was observed in two ways: first, there were very few repetitions of ideas, and when this did occur, the students were, in my opinion, still genuinely engaged; second, and very impressively, the students listened carefully to each other’s ideas and were able to build off these ideas to offer new insights and/or perspectives.

At this point, it seemed like the right moment to formally introduce the students to the QFT™. I decided on a Qfocus that I believed had relevance for all of the students in the class yet at the same
time was somewhat generic in its nature. The reason for this was simply to keep the focus on the process and less on the content of the Qfocus. I started off by introducing and explaining/reviewing both the process as well as the four rules for administering the QFT™ (figures 3 and 4 respectively on page 43).

I briefly explained that the goal for using this process would be to help us become better at asking questions and to have the questions that they come up with become a big part of the inquiry learning engagements within our units of inquiry.

Before introducing the Qfocus to the students, I asked them if they felt they would have any difficulties with any of the four rules. One student offered that they “love asking questions” (student 6) which was quickly followed by a second student’s response that they “love answering questions” (student 2). To this, I asked the specific question, “Does anyone think they will have difficulty when it comes to not discussing or wanting to answer the questions right away?” Without a firm yes or no response from the students, I felt that this might be the one area that would require some attention as we went along.

The next step was to show the students the Qfocus written down on chart paper, which read, “Being an inquirer helps me to expand my knowledge”. Similar to the previous lesson where we looked at a Qfocus, I began by having the students determine the key words that would help us to better understand or clarify the statement. They directed me to highlight the following words in the statement, “Being an inquirer helps me to expand my knowledge”. Next, I invited the students to begin asking any questions that would help us to better understand this statement. I also referred to the visual of the question words that they had previously come up with to help them shape their questions, if needed. Further, I encouraged them to ask questions that they might even know the answer to already. An example of this could be, “What does inquirer mean?” since the students
already had a fairly good understanding of this concept. Although I had no real idea what to expect, I was truly overwhelmed as the questions started to flow and they continued for approximately 10-15 minutes. The questions were:

- What does expand really mean? (student 2)
- What does knowledge mean? (student 1)
- What type of knowledge is it? (student 9)
- Is there a certain kind of knowledge? (student 16)
- Where do you get the knowledge to expand? (student 5)
- Which knowledge do they use? (student 9)
- Where do we expand our knowledge? (student 7)
- When do we expand our knowledge? (student 6)
- Why do we expand our knowledge? (student 10)
- How much knowledge do we use at one time? (student 16)
- Where do you get the knowledge to expand? (student 4)
- How does being an inquirer help me learn? (student 3)
- What is an inquirer? (student 15)
- What types of questions do inquirers ask? (student 7)

After thanking the students for the wide variety of powerful and relevant questions, I explained to them that we needed to do two more activities with the questions that would allow us to begin to answer or look for answers for most or all of their questions. Moreover, I mentioned that I had a very important question for them at the end of the lesson. First, I asked them to look closely at the questions and to choose at least two BIG and two quick questions. The BIG questions are highlighted above in green while the quick questions are marked in light blue. Next, I asked the students if there were any other questions that they felt should be answered in order to better understand the statement or that would help them to answer other perhaps more complicated questions. Without much hesitation, student 7 astutely pointed out that we would need to answer the question, “What does
knowledge mean?” highlighted in pink since according to this student “the word knowledge appears in so many of the other questions”. Finally, I ended the lesson by asking the students to share a few thoughts about the QFT™ and if they felt it would help us to ask more and bigger questions. The following reflections quickly reinforced to me that we were off to an auspicious start:

- I can’t believe how many questions we came up with (student 9)
- Mr. Elves, did you think we could come up with so many questions? (student 7)
- Last time we only got five questions and this time we have so many (student 16)
- Do you think we will be able to answer all the questions? (student 1)
- When can we do this again? (student 4)

The Student Voice: Implementing the QFT™ within the Units of Inquiry

In this next section, I will describe and demonstrate how we used the QFT™ three different times twice within two different units of inquiry, Matter and Mapping. To clarify, I will provide a thorough narrative of how I implemented the QFT™ along with a series of other related lessons to support the teaching and learning within a unit of inquiry on Matter in Science. In addition, I will demonstrate through a series of graphs how the QFT™ has significantly impacted student learning within the Matter unit, as well as a subsequent unit of inquiry on Mapping. It will become evident how the process can be used to lead and support whole group, small group and individual inquiry activities and how the thoughts, comments and/or questions generated virtually independently by the students can impact the learning process in many positive ways. As outlined in the Instruments and Procedures section in Chapter 3, the objective with this information would be to quantify the number of questions asked by the students and further to compare that number to the number of questions asked by students in the previous two years of teaching these same two units. Additionally, as a researcher, I would determine if any of the student ideas or questions were used to create the central
idea or to shape the lines of inquiry for the unit of inquiry, and furthermore the number of questions asked that led to further inquiries throughout the unit.

It should be noted that although the process for administering the QFT™ remained consistent throughout whereby we reviewed the four rules and I led the students through the different stages (components) of the process, I have chosen, in the interest of this project and its focus on student questioning, to discuss the student questions and their impact rather than exhaustively detailing each of the steps on each occasion.

Given that one of the primary objectives of this study was to observe the impact that the students’ questions could have on the teaching and learning, I decided to choose a Qfocus that was aimed at launching a whole class unit of inquiry in the area of Matter in Science. As a teacher, I am very familiar with this unit as I have taught it in each of the past five years to students at the same grade two level. Previously, the central idea (big idea) for this unit had been, “Matter is everywhere and has the ability to change under certain conditions”. I made the decision to alter it ever so slightly at the same time as maintaining its essence, which I hoped would allow the students to potentially and hopefully draw out and make connections to the key concepts for this unit: form, change and causation. Therefore, the new Qfocus became, “Matter is everywhere and can change over time”.

I maintained the specific word change in hopes that the students would be able to formulate questions that would help them to think of further questions to explore the other two concepts in more depth. The concept of change, in my experience, is much more obvious to the students throughout this unit of study as they participate and engage in a series of experiments where they are able to see changes firsthand. Therefore, it would be advantageous for the students to focus on the concept of form by identifying and labeling the various states and their properties as they discover them, as well
as the concept of causation which would allow them, through their observations and investigations, to investigate the factors and conditions by which matter can change.

After a quick review of the framework and rules for the QFT™, it was time to present the Qfocus to the students. It was not the fact that there happened to be four colleagues from a visiting school watching this lesson to observe how we engaged our learners in the inquiry cycle, but rather it was the anticipation of what was to come and how this could potentially change the very nature of inquiry learning both in our small school environment and elsewhere that I was wondering quietly to myself, “What if I had completely misjudged or miscalculated the skills or learning potential of the students? What then?”

With bated breath, this sense of nervousness lasted no more than a few seconds as a hand went up to offer the first question, “Why does it change?” From there, the students proceeded to come up with a series of thoughtful and relevant questions based on the statement, “Matter is everywhere and can change over time”:

- Why does it change? (student 3)
- How does it go everywhere? (student 8)
- How can it change? (student 6)
- What IS matter? (student 7)
- How does matter work? (student 2)
- Why is it everywhere? (student 1)
- How is matter everywhere? (student 7)
- How does it change over time? (student 16)
- What can matter do? (student 9)
- Is matter always the same? (student 15)
- Can it move? (student 11)
- How can it move? (student 16)
- Will it make a problem? (student 3)
- When does matter change? (student 4)
- Who discovered matter? (student 13)

In my estimation, these are some powerful questions for a group of grade two learners. It would be easy to say that the support and guidance in the previous lessons is what made the
difference, but that is only partly true. I could also say that this new and very clear protocol for generating and formulating questions is directly responsible, but again, that would only be partly true. In fact, although these are contributing factors, it became more evident in listening to this young group of confident and communicative learners that we were already doing an exceptional job at the Kindergarten and grade one level in honing the beginning and developing questioning skills in our students. So in the spirit of true reflection and with a desire to learn and grow, I felt obliged to quickly consider how the Question Formulation Technique™ could be used most effectively to support the growth in inquiry learning for our students at this time.

To this end, I reconsidered the steps (components) of the QFT™. Given that these learners appeared to be quite skilled in the first two steps (producing and improving upon their questions), I felt it would be most helpful and beneficial to spend a more significant amount of time having the students first prioritize then determine how their questions can and should shape the inquiry activities.

Once the students were satisfied with their list of questions, I ended this part of the lesson by asking them if there were any questions that they felt we needed to answer first (to prioritize) in order to help answer any or all of the other questions. Resoundingly, the students agreed that we needed to investigate student 7’s question from page 52, “What IS matter?” to begin with.

Before long, the students found themselves in small groups brainstorming and discussing what they believed matter to be. I provided the students with approximately 15 minutes to generate as many ideas as possible to define what they believed matter to be. At this point, I decided to engage the services of the resident experts (that is the grade three students who had completed this unit the year previous) to help substantiate or clarify the grade two students’ ideas. During this discussion, I recorded the following comments:
As a teacher I was simply happy that the classroom was buzzing with excitement and the students were happily engaged and enjoying their learning. As a researcher, however, I was trying to be cognizant of what it was that was allowing the students to be so successful with this process in the early stages. One of my first and most impressive observations was that it didn’t take too much explaining before the students were comfortable with using the process. For example, I had thought that they might have difficulty with rule 2 of the QFT™ protocol in not stopping to judge, discuss or answer any of the questions; however, with one or two reminders, the students were able to maintain their focus and follow through with each of the steps thoroughly. Another element that was clearly evident was that each and every student was completely engaged throughout the activities with almost every student contributing a question or a comment. In fact, I also noted that the majority of the
students who had yet to make a contribution in previous lessons related to the QFT™ had begun to assert their ideas more willingly. Moreover, when I asked the students whether they had used a variety of the question words from the posted list, they were able to quickly point them out. In the context of this study, I feel that it was a good decision to do the buildup in advance without telling them exactly why we were doing what we were doing. That is, talking about the nature of questions, including the question words and describing how and why we ask questions. In doing this, the students had inherently built up a repertoire or skill set that would serve them during and throughout this process.

The last activity (lesson) that remained for this Qfocus was introducing the students to the lines of inquiry that would be posted on our inquiry wall in the classroom. These (teacher written) statements would be the focus of the inquiry activities that the students would undertake over the subsequent five to six weeks. In the past, I had always provided the students with both the central idea and the lines of inquiry and, by the end of a particular unit, it was always my impression that the majority of the students were capable of reciting them verbatim without ever really being able to connect them directly to learning experiences during the unit of study.

Although it would be ideal to have the students help me to craft the lines of inquiry, I still felt that it was important for them to have a deeper initial understanding and context for the lines of inquiry. To achieve this, I presented the students with each of the statements separately and asked them to find any of the comments that they had contributed during the previous “What IS matter?” activity. The first line of inquiry was “The states of matter and their properties” which are highlighted on page 54 in yellow, the second was “Changes found in matter when heated or cooled” which are highlighted in green and the third line was “Interactions between the states of matter” of which they were not able to connect any of their comments to. To be fair to the students, I gave them the chance
to ask any clarifying questions about the statements and they came up with the following two: “What does properties mean?” (student 1), and “What does interactions mean?” (student 5). After a brief discussion to clarify these two questions, the students were ready to label the relevant comments. Concerned that they were not able to connect any of their comments to the third line of inquiry, the students asked if they could use the grade three comments. Subsequently, they were able to rationalize that the “interactions between the states of matter” was like “how the things in the world get along” and from that they chose four of the grade three comments which are again highlighted on page 54 in light blue.

In all, this was a very successful and meaningful way to begin this unit of inquiry. The students were not only highly engaged and involved in the process, but more importantly they were highly motivated to get going with investigating both the lines of inquiry and their initial questions. This passion for and commitment to learning would continue incessantly throughout the course of the entire unit, and in fact, in my opinion, it set the course and the tone for the rest of the school year.

The second Qfocus for the Matter unit was designed to explore the properties of matter. It read “The properties of matter tell us everything we need to know about the world”. Instead of simply presenting the concept of what a property is to the students directly and having them describe or name certain properties of matter, I wanted somehow for them to elicit some of the conceptual understanding first.

Using the notion of backward design (Wiggins and McTighe, 2005), I figured I would tell them directly yet ambiguously that the properties of matter could help us in some way. In the past, I had explored the nature of properties with the students and then used the ‘So what?’ question to encourage them to make further or bigger connections. However, by adding the description
“will tell us everything we need to know”, it would be my hope that the students would begin to ask questions to seek clarification of this general statement to explore afterwards.

For the question formulation part of the activity, I had the students work in groups of four (one student was absent) in order to generate, decide on and present their questions as a team. I prefaced the activity by encouraging the students to come up with questions that would help someone that has no understanding or no idea what the statement means. That way, it could serve to minimize any discussion or desire to answer the questions as they came up as this would be much more difficult to monitor as the students were working with their groups in their own spaces. Furthermore, I reviewed the four rules of the QFT™ with the students and I reminded them that it would be important for them to respect the rules while working in their groups.

Initially, I had chosen to put a restriction on the groups. Specifically, I mandated that each group member had to ask at least one question. However, as I walked around listening to each of the groups, I found that this restriction was just that, too restricting. I noticed that the students were getting too caught up in trying to figure a plan for each of them to ask a question. Ultimately, they were being too righteous in trying to respect this demand and, in fact, they were focusing much more on that than they were on listening to each other in order to come up with their questions related to the QFT™.

Although I was very impressed with the idea that the students were taking responsibility, I still felt compelled to explain that I didn’t want this to get in the way of their thinking or their ability to come up with questions. Once I removed this restriction and simply instructed the groups to begin writing them down and not to worry about who was asking them, they confidently got back to work.

Before we came back together to share the questions as a whole group, I instructed each group to decide on two questions that they would share. Furthermore, I stated that if they chose the same
question as another group that was already written down, then they would need to choose a different question to share.

I wrote the Qfocus, “The properties of matter tell us everything we need to know” on a chart paper and invited groups to share their questions one at a time. The following eight questions represent 21 questions asked in total by all of the groups:

- How many properties are there in the world? (students 5, 6, 7 and 14)
- When does matter tell us everything we need to know? (students 1, 9, 12, and 14)
- Where do we find properties? (students 8, 13, 16 and 17)
- Why does matter tell us everything we need to know? (students 2, 3, 4 and 11)
- Does all properties tell us everything we need to know about matter? (students 8, 13, 16 and 17)
- How do properties work? (students 5, 6, 7 and 14)
- How does it tell us everything we need to know? (students 1, 9, 12, and 14)
- What are properties and what are they made of? (students 2, 3, 4 and 11)

To end this activity related specifically to developing student questions to support this Qfocus, and before embarking on some exciting adventures that would allow the students to begin to investigate their own questions and curiosities, I reminded the students that they were not to repeat any other group’s question. When I asked them whether we had achieved this in the list of eight questions, they all emphatically agreed that they had. However, before we moved on and in order to evoke some academic tension, I queried their choices somewhat. I suggested that although the questions looked different in that they were not written down exactly the same, I challenged them to consider whether the three questions that read, “When does matter tell us everything we need to know?”, “Why does matter tell us everything we need to know?”, and “How does it tell us everything we need to know?” were similar in nature.

My goal of course was not to confuse them too much or to diminish or undermine the work they had already done along with the excitement that was being nurtured in these young learners, but
it was rather meant to show them and have them begin to understand more clearly how questions can serve different functions or purposes, and even though they might appear similar, they can render very different results or answers. Rather than overwhelming them with this explanation, I chose rather to state that it would be exciting to see the types of findings that they come up over time.

With this, I asked the whole group to decide which question we would need to explore first (prioritize) that would help us to consider the other questions. After some deliberation, the class agreed that it would be necessary to answer the last question in the list, highlighted on page 57 in green. I immediately referred to the list of questions and highlighted the third question, marked in yellow, and simply said, “Let’s go find out!” We spent the next 30 minutes using our five senses to explore the immediate environment around us inside and outside of the classroom and school. My direction for this activity was to simply “use your five senses to explore the world around us and be prepared to talk about your observations when we come back together as a group”. Needless to say, the students’ awareness and understanding of ‘the properties of matter’ was quickly cultivated in a very meaningful and powerful way in a short period of time. The most rewarding part for me as the teacher, as well as, in this case, the researcher was the notion that it had very little to do with me telling them or instructing them about what they were going to learn.

The final Qfocus that I presented to my students to support the Matter unit was, “The steps of the Scientific Method help scientists learn about the world around us”. As this would be our first individual Qfocus inquiry, I decided to send this one home for the students to do as homework. Once they generated the questions, they would bring them back to class to discuss as a whole group.

I decided to present this Qfocus in advance of launching into a series of experiments in the classroom, including individual inquiry experiments that the students would be expected to present towards the end of the unit. In previous years, I had always started with the teacher question, “What
does a good scientist do when they conduct an experiment?” Although the students were able to build on their knowledge of the scientific method, I found that too much time was needed to develop this understanding and, too often, I had to ultimately guide them in the ‘right’ direction.

Although, at first, I was a bit apprehensive to send this activity home, wanting to ensure that the students were coming up with the questions themselves, I quickly realized that the overall goal was for them to become increasingly familiar with the process of generating questions on their own and then using that information to determine or prioritize how to best use them to support the learning process. So, I realized that if their parents helped them with it, that it would be both reasonable and acceptable, as it was more about learning the process. Either way, I would certainly ensure that this would be part of our reflection activity when we came back together to share the questions.

As soon as I handed out the paper to discuss in advance of sending it home to complete, there was an immediate buzz in the classroom. Even though I explained to the students that their task would be to come up with questions related to the statement, no less than three students expressed confusion by the words in the statement. When one of the students said, “I don’t know what it means”, I responded loud enough for everyone to hear, “So, you can turn that into a question”. The student looked at me and very confidently said, “What does it mean?”, and I looked back with a smile and simply said, “Write that down!” I used that question again to speak to the students about how the QFT™ can help us by coming up with questions to help us better understand our learning (intentions).

At this point, another student spoke up and said, “I absolutely have NO idea what this means”. My response to this statement surprised many of the students when I said, “Perfect! I’m glad you don’t understand…and I’m super proud of you for sharing how you are feeling about it”. When I asked the class if this student should just give up and not do the activity, they emphatically responded,
“NO!”. They suggested that it would be best to try to figure out what it means first.

With this in mind, I reminded the students to use the key words to come up with questions that would help us better understand what it meant. As I was handing out the papers and having them put them directly in their backpacks to take home, I noticed that a number of them were already writing something down while a few others said, “But I already have a question, Mr. Elves” to which I replied, “Then write it down!”.

Finally, I explained to them that I really wanted them to come up with the questions themselves, so it might be possible that some of them might only have one question while others could have many more, and that that would be perfectly fine. In the meantime, I overheard one of the students say to their neighbor, “What if I don’t get one question?” and the other student responded by saying, “I bet you can think of at least one good question!”.

The following Monday morning, the students happily and excitedly came in with their worksheets completed with different questions that they had come up with. Knowing that this wasn’t a ‘test’ on whether they came up with the questions themselves, whether their parents had come up with questions or whether they co-constructed them with their parents, I asked the students to share a few ideas of how they were able to generate the questions. One of the students said, “My mom helped me come up with the questions and I wrote them down”, another student said that they had written down three questions “before I even got home”, while another student shared, “My dad was helping me but he didn’t even understand what it was so had to look it up first before he could help me”, and finally another student proudly stated, “I tried to explain to my mom how to do it, then I just wrote my questions down on the paper”.

Instead of just having the students read their questions right off the papers, I collected them first, and then asked them to share some of their questions from home in order to gauge how much of
the information had stuck with them. I wrote down the Qfocus, “The steps of the Scientific Method help scientists learn about the world around us” on chart paper and invited the students to begin to share. The following 13 questions represent a comprehensive list of 67 questions that the students came up with in total:

- How does the scientific method help scientists? (student 7)
- How much steps are there? (student 16)
- Why do scientists need to learn about the world? (student 1)
- What questions do we ask about the world? (student 14)
- **What is the scientific method?** (student 17)
- **What are the steps of the scientific method?** (student 4)
- Why is the world important to learn about? (student 2)
- What tools do we use? (student 5)
- How does the scientists learn more about the world? (student 3)
- Can I use it? (student 7)
- Is the scientific method important? (student 16)
- How does it help the world? (student 8)
- **What is method?** (anonymous)

As they were sharing their questions, one of the students, who had typically been a more passive participant in the previous two lessons using the QFT™, brought up the idea that while talking to his/her dad (I will use her for this example) about the Qfocus and specifically when it mentioned the scientific method, she said she didn’t know what method meant and that she was really curious to know, but her dad wouldn’t tell her. Instead, her dad encouraged her to write that into a question. When I posed the question to the whole class if they thought this was a good idea or whether her dad should have just told her, they became very defensive, saying that it wouldn’t be good for her.

“That happened to me, too!” a few other students chimed in. When asked what they thought her question might be to help clarify her curiosity, two students suggested, “What is the scientific
method?” highlighted on page 61 in **green**, or “What are the steps of the scientific method?” highlighted in **pink**. Then, after some quick reflection, another student declared, “What about *What is method*?”. The original student quickly added, “That’s exactly the question my dad and I came up with!”, again highlighted on page 61 in **yellow**.

As both teacher and researcher, I just sat back and enjoyed listening to the mature discussion that the students were engaged in. I used this opportunity to explain that this is exactly what it means to “think in questions”, and that we are helping to prove why it is so important that the students come up with the questions. I spoke to them about the idea of how we were like “question scientists” and that people in different classes around were interested in what or, perhaps more appropriately, how we were learning. To say the least, this was just the beginning of very productive, highly enriched unit of study, one that would, in my humble opinion, impact their learning now and in/for the future.

**The Student Voice: The Impact of the QFT™ on Teaching and Learning**

One of the major benefits for myself as both teacher and researcher was my ability to reflect on the process and make any necessary adjustments or improvements that could be directly incorporated into subsequent learning activities. Although these changes did not alter the ways in which I organized or presented the actual QFT™ process to the learners, I was able to determine more effective ways to maximize the students’ ownership of their learning from the outset. An excellent example of a change that significantly impacted student learning occurred as I was preparing to initiate the second unit of inquiry on Mapping.

I had previously asked myself whether it would be possible, especially at this young age, for the students to have a role, if not take full responsibility, in crafting the central idea for the unit of
study. That way, from my perspective, they would possess complete ownership of the overarching principles for learning within that particular unit.

To this end, I began this Mapping unit by simply presenting the students with a piece of paper with the question, “What is a map?” clearly written in the centre. Strategically, I handed out this paper at the end of the day on a Friday and gave them no instructions other than, “Please remember to bring this back on Monday”.

It came as no surprise to me that all 17 students arrived first thing Monday morning with their papers in hand ready to discuss what they had written down on their papers. In the past years, I have always presented the students with the central idea, “Maps are tools that help us to know where we are and show us where we want to go” and, as previously mentioned, my feeling is that the students tended to learn it by rote without seemingly making any deeper conceptual understandings on their own.

In this situation, I was fully prepared to change the central idea completely, however, you will see how their work and information enabled us to come up with the exact same statement, yet, in this case, they had almost complete ownership of the concepts within it.

As I wrote down their work for them to see on chart paper (transcribed literally), I used different colour highlighters to connect their ideas in order to find common themes that would help us draft a new central idea. However, as you can observe by their comments, their ideas essentially related directly to the previous year’s central idea, “Maps are tools that **help us to know where we are and show us where we want to go**”:

**Student 1**
- A globe is a **type of map**
- It can be in **any shape or size**
- It is **something** that you **follow to get something or somewhere**
Student 2
- A map can be a treasure map for a treasure hunt
- A world map can show you the world
- A map for a car tells you where to drive
- On a chairlift in Whistler it will show you where you can go

Student 3
- It tells you where to go
- It tells us if there is danger
- It tells us how long it is to go somewhere

Student 4
- A GPS is a map
- A map helps when you need to find somewhere
- A map can be rilly big or rilly small

Student 5
- A map is something that shows where to go
- It helps to find the way when you are lost
- A Map has lines and pictures and names of places

Student 6
- A map is something that tells you where to go when you get lost
- For example, if you are going somewhere, and it’s your first time, and you don’t know where it is, a map can help you find your destination.

Student 7
- A map helps you to find your way when you are lost
- You can buy a map in a store
- You can find a map on the computer. My dad showed me how to use Google maps.

Student 8
- You can use a map to find different places
- My mom showed me a map of Europe to show where we are going in the summer
- Maps have lots of information to help people find places they are looking for

Student 9
- A map can be used for war strategy
- It has cities with labels
- A map can help you
- A map is a picture with a bunch of places
Student 10
- My mom said that a map helps you get from one place to another
- A map can help you learn about different places
- I have a globe at home

Student 11
- A Map is for showing Different countries, names of capital cities

Student 12
- A treasure map helps you find treasure
- I used a map at the mall one time to help my mom find stores
- My dad says that our GPS is like a map

Student 13
- It has directions
- Maps are awesome because they help you find your way
- Maps are help full when you are lost
- Maps help you find the green runs when you are skiing

Student 14
- A map is like a drawing
- It tells you where you are
- It tells you where to go
- It shows you different places
- It tells you about different places

Student 15
- A map is a thing that tells you where to go
- A map is some thing that tells you where you are
- A map is a thing that tells you where a place and things are

Student 16
- It shows you direction (north arrow)
- It shows you where to go
- It is a picture of an area
- It has a scale

Student 17
- A map tells you where places are
- It helps better explain ideas
- Helps represent objects in space
In addition to using the vast majority of the students’ comments to construct the central idea for the unit, you can see how many of these contributions could be and were, in fact, used to have the students help craft the specific lines of inquiry that would be used to guide many learning engagements over the course of the following five to six weeks within this unit of study. The lines of inquiry for this unit on Mapping were: 1. The different kinds of maps and their uses; 2. Identifying and locating specific elements or places using maps; and 3. How to create and interpret simple maps using the key features. The student data collected and represented on the previous two pages, clearly reflects the impact that this process has had and continues to have on the students’ questioning behaviours. These positive changes to student learning are further detailed on pages 70 and 71 in the ‘So what does this all mean for me?’ section.

The information and data in Tables 1 and 2 on pages 68 and 69 was collected and recorded verbatim from student responses during two separate lessons on two different occasions during the 2012/2013 school-year (September 2012 and May 2013) in which I asked the students the three questions followed by having them provide oral answers. It was my intention to use this information to compare and contrast their contributions to determine whether they had developed a more metacognitive awareness of their learning, and if or how it could help them to develop their questioning behaviours by assuming more responsibility within the inquiry process.

In general, it can be noted that these young learners arrived in grade two already possessing an ability to express a good level of understanding at a young age for the inquiry process and more specifically what a question is and why they are important to help us learn. By looking at the volume and breadth of responses provided by the students during the two lessons in May 2013, it is clear that these increasingly independent learners recognize and are able to clearly express a solid understanding of the nature and function of asking questions, and further, they use precise language to provide examples how questioning can support and enhance the inquiry process for them.
<table>
<thead>
<tr>
<th>Reasons for Asking Questions</th>
<th>September 2012</th>
<th>May 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>So you get smarter and smarter, and you’re full of ideas</td>
<td>(student 14)</td>
<td>So we can get answers and get smarter</td>
</tr>
<tr>
<td>If we don’t understand something, we have to ask questions to understand better</td>
<td>(student 5)</td>
<td>So we can know important facts</td>
</tr>
<tr>
<td>To help us learn</td>
<td>(students 2, 3 and 8); and to learn more</td>
<td>(student 4)</td>
</tr>
<tr>
<td>So that we can answer them to find out like, ‘how many bones in the body’</td>
<td>(student 7)</td>
<td>We ask questions to answer other questions or to get more questions</td>
</tr>
<tr>
<td>If we don’t know something, then you can ask someone like, ‘what is your name?’</td>
<td>(student 15)</td>
<td>If it’s a question that we really want to find out, we can say it then other people might know the answer so they can tell us the answer</td>
</tr>
<tr>
<td>Without questions, it would be much harder to learn stuff</td>
<td>(student 7)</td>
<td>So we can learn stuff and get smarter</td>
</tr>
<tr>
<td>When you ask questions, your learn more and stay safer</td>
<td>(student 16)</td>
<td>So we can find out about the world or about things we never knew</td>
</tr>
<tr>
<td>So people can tell you how things work, like ‘how do clouds move?’</td>
<td>(student 1)</td>
<td>So our life can be better</td>
</tr>
<tr>
<td>If we don’t ask questions, then we can’t think of anything</td>
<td>(student 13)</td>
<td>We ask questions so we know more about whatever we are learning about</td>
</tr>
<tr>
<td>If we don’t ask questions, we won’t be smart enough to be an IB student</td>
<td>(student 5)</td>
<td>If we didn’t ask questions then we wouldn’t be learning and we couldn’t share ideas like ‘what is perspective?’</td>
</tr>
<tr>
<td>If we don’t ask questions, we can’t get smarter and we won’t get a job to buy a house and then we won’t be happy</td>
<td>(student 12)</td>
<td>If we don’t ask questions, we can’t get smarter and we won’t get a job to buy a house and then we won’t be happy</td>
</tr>
<tr>
<td>Asking questions is learning and that’s how most teachers teach. The kids will ask the questions and the teacher will help them find the answers</td>
<td>(student 6)</td>
<td>We ask questions to get more knowledgeable because at SP, we are thinkers and inquirers</td>
</tr>
<tr>
<td>If we don’t ask questions, we won’t know what other people’s opinions are</td>
<td>(student 7)</td>
<td>We ask questions to get less curious about things we are curious about. But actually, we can also get more curious sometimes and ask more questions</td>
</tr>
</tbody>
</table>

Table 1 – student responses to the question ‘Why do we ask questions?’ asked and recorded both in September 2012 and in May 2013
Are all questions the same? and How are they the same or different?

<table>
<thead>
<tr>
<th>September 2012</th>
<th>May 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>• No, because everyone thinks of different questions (student 3)</td>
<td>• They can be different because one can be a Math question and another can be a question like ‘what’s your favourite colour?’ (student 2)</td>
</tr>
<tr>
<td>• Also because everyone just thinks different (student 9)</td>
<td>• I think she means that different questions can be about different subjects (student 9)</td>
</tr>
<tr>
<td>• No, because we have our own brains to come up with our questions (student 10)</td>
<td>• One thing I know is that not all questions have answers right away. Like for example, ‘how many days will it take to build a school, when it’s not even built yet?’ (student 5)</td>
</tr>
<tr>
<td>• No, because people are curious about different things (student 16)</td>
<td>• They are different sometimes because everyone is thinking about different things (student 14)</td>
</tr>
<tr>
<td>• No, because you ask different things like ‘can I have a drink?’ or ‘how do you spell circus?’ (student 7)</td>
<td>• Some questions are not easy to answer. Like when I was trying to find out how long can a killer whale stay underwater? I found lots of different answers to my question. So, I had to figure out which one was right. (student 7)</td>
</tr>
<tr>
<td>• Well yes sort of, because they are all questions (student 5)</td>
<td>*at this point, another student interjected and added, ‘that’s why Mr. Elves says we should question everything we read’ (student 1)</td>
</tr>
<tr>
<td>• Some are the same, they’re just worded differently (student 7)</td>
<td>• Questions are different because different people ask different kinds of questions (student 13)</td>
</tr>
<tr>
<td>• They might have different words in them but they all still need an answer (student 4)</td>
<td>• They can be different by how you ask them. We use lots of different question words to ask different questions (student 1)</td>
</tr>
<tr>
<td>• They are the same sometimes, because they always have a question mark at the end (student 1)</td>
<td>• Questions aren’t always the same because you don’t always get the same answer. This happened a lot when we did our science experiments (student 6)</td>
</tr>
</tbody>
</table>

Table 2 – student responses to the questions ‘Are all questions the same?’ and ‘How are they the same or different?’ asked and recorded in September 2012 and again in May 2013
The Student Voice: So what does this all mean for me?

In previous chapters, I have attempted to describe our school’s learning environment as one in which a strong stance on inquiry is embraced and embodied by all members of the school community. Consequently, it is my opinion that the sum amount of success of this project can be in large part directly attributed to the commitment and support of all stakeholders, most importantly the students.

To begin to qualify and synthesize the elements of growth and change that have enhanced the overall learning potential of the students in our primary learning environment, it is important to reconsider the title of Dan Rothstein and Luz Santana’s book, Make Just One Change: Teach Students to Ask Their Own Questions (2011).

In my dual role as both classroom teacher as well as action researcher, I feel strongly that the single change of teaching these young learners to be more efficient question posers has resulted in a multitude of skills, traits and aptitudes. By reconsidering the research question from Chapter 1, “If we consistently engage learners in the QFT™ process, in what ways will their questioning behaviours strengthen and/or change?”, the data collected and analyzed from the classroom activities and lessons directly related to the implementation of the QFT™ enabled me as a teacher researcher to begin to make and record a number of observations. The following non-exhaustive list demonstrates many of these very behaviours that, in my estimation, will serve the students now and in the future to maximize their capacity as independent thinkers and resourceful inquirers:

- The foundational work in earlier grades and the consistency between year to year, class to class and teacher to teacher is critical to the success of all stakeholders
- With the support of direct teaching, the students are becoming proficient co-constructors of their learning and are playing a significant role in the decision-making process with respect to shaping the learning path
• The students’ metacognitive awareness of the learning process (the inquiry cycle) is developing as they are able to more successfully describe their learning, suggest ways to direct or improve it and reflect on it afterwards to impact future learning opportunities.

• The students’ strong listening skills, including respecting, validating and embracing each other’s ideas and perspectives. Moreover, their acute listening abilities enable them to make few repetitions of others’ contributions.

• A high level of engagement by all students who responded to and were motivated by the clarity, predictability and repetition of the steps of the Question Formulation Technique™.

• Student engagement and motivation has been further heightened enabling them to go deeper in their learning and empowering them to take more responsibility in initiating, sustaining and reflecting on their learning. That is, when they felt they were in the driver’s seat (i.e. making decisions or being acknowledged for their contributions) or when they were making discoveries own their own that led to further learning opportunities for themselves or the larger group.

• Students are further motivated and empowered when their names are attached to specific comments and questions. This ownership of ideas gives them a sense of personal pride and further motivation to challenge themselves and each other.

• The students possess a strong understanding of the mechanics of how to structure or formulate a question, including a variety of question words as well as being able to differentiate between the relevancy of comments and questions.

• The nature of the students’ comments and questions have increasingly moved from being general to being topic specific which has enabled them to delve even deeper into their learning. Moreover, the QFT™ has enabled the students to make deeper connections to and develop a deeper understanding of the key concepts in the IB programme. Consequently, their questions are beginning to reflect a wider range and variety based on the 8 concepts (form, function, change, causation, responsibility, perspective, connection and reflection).

• In addition to having a more solid understanding of how to structure a relevant question within the context of their learning using the process of the QFT™ (developing questions based on Qfocus statements related to subject specific topics), the students’ understanding for formulating and asking powerful questions is beginning to transfer more naturally and seamlessly to other topic discussions or activities not directly related to the QFT™.

• The students are having fun and laughing as they are working together and learning with and from each other ultimately building a stronger and more respectful understanding of and for each other’s learning strengths.

**The Parent Voice: This is so different from the way I learned**

In February 2013, I sent consent forms along with questionnaires (Appendix B) to request parent participation to provide feedback about their child’s questioning behaviours and whether they
had observed any changes in these behaviours over the course of the school year since we began using the QFT™. In addition, I was looking to glean a sense of how they felt this style of learning could impact their own child’s learning or help them in general both now and in or for the future.

Of the 17 families in my grade two classroom, I received eight responses for each of the two questions that were both voluntary and anonymous. To maintain the highest level of anonymity for the parent participants and their children, the information was sent directly to an assigned third party who then accepted the responsibility to transcribe the information provided. Moreover, any direct reference to a student’s name was changed to ‘my child’ and the pronouns ‘he’ and ‘she’ were placed randomly within each of the responses so as not to definitively indicate the gender of the child in question.

Once the parent responses were organized in the table (Table 3, pages 72 and 73), my goal was to review and closely analyze the information to look for common themes that could ultimately help me to substantiate the effectiveness of the QFT™ outside of the school context and/or to build stronger connections between home and school that would ultimately benefit the students’ learning.

<table>
<thead>
<tr>
<th>Question</th>
<th>Categories</th>
</tr>
</thead>
</table>
| 1. Describe any changes or general observations you have noticed about your child’s questioning skills over the past few months | • Increasingly focused and more diverse questions  
• Probing questions (delves deeper)  
• Processes information more thoroughly  
• Reflects on learning  
• Logical thinking  
• Engagement and participation  
• Thirst for knowledge  
• Builds on natural curiosity |
2. In your opinion, how do you feel questioning can help your child in his/her learning and/or daily life?

- Provides focus and clarity
- Promotes critical thinking
- Encourages meaningful engagement
- Develops self-confidence and communication skills
- Builds on natural curiosities

Table 3 – Common themes from parent responses to the Questionnaire (Appendix B)

The majority of parent responses indicated that although they feel young children are naturally curious and that asking questions, from their perspectives, is somewhat of an inherent skill, they have indeed noticed many changes, both general and specific in nature, in their children’s questioning skills as well as many noticeable gains that have impacted their own child’s learning. Moreover, the nature of these changes, according to many of the parent comments have seemingly benefited these children both in the school environment as well as more generally in their daily lives now and for the future.

Many of the responses to the second question indicated how much they value questioning as an integral component to their child’s education and, in fact, how questioning would allow the students to develop a skill set that would nurture their curiosity, ultimately enabling them to navigate the world around them with more meaning and confidence. In no less than three of the responses to this question, parents remarked how questioning is an essential or integral skill for their children to learn, which should be, according to one parent, “at the heart of all learning”.

Although a number of responses in both questions indicated a natural inclination for their child to ask questions, therefore, making it, as one parent noted “difficult to say if there’s been an increase in his questioning skills”, the majority of families have, nonetheless, observed significant growth in their children’s engagement with their learning based on, as another parent put it “what he is readily and confidently sharing with us at home”.

<table>
<thead>
<tr>
<th>2. In your opinion, how do you feel questioning can help your child in his/her learning and/or daily life?</th>
<th>Table 3 – Common themes from parent responses to the Questionnaire (Appendix B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Provides focus and clarity</td>
<td>• Provides focus and clarity</td>
</tr>
<tr>
<td>• Promotes critical thinking</td>
<td>• Promotes critical thinking</td>
</tr>
<tr>
<td>• Encourages meaningful engagement</td>
<td>• Encourages meaningful engagement</td>
</tr>
<tr>
<td>• Develops self-confidence and communication skills</td>
<td>• Develops self-confidence and communication skills</td>
</tr>
<tr>
<td>• Builds on natural curiosities</td>
<td>• Builds on natural curiosities</td>
</tr>
</tbody>
</table>
The following comment from another family, in my opinion, sums up the general feeling of the parents about the work that we are doing at Sequoia Park with respect to developing the minds of these young learners as thinkers, as inquirers and more specifically as questioners:

“We feel that questioning is a very important part of our child’s learning. It involves her as a more active learner, keeps her engaged and more responsible for her learning, and for this, we are truly grateful that our small school supports this growth in our child and her natural curiosities”.

The Teacher Voice: How is this different from what I am already doing?

One of the greatest strengths yet biggest challenges for teachers is to continually inform and improve upon their teaching practice as they continue to educate the young minds of the learners in their care. In the case of my colleagues who contributed their thoughts and perspectives by responding to the Questionnaire (Appendix C) that I sent out in January 2013, along with the entire teaching staffs at both Sequoia Park Primary and Maybank Elementary who allowed me to share the journey of this study with them, I am eternally indebted. By listening to and considering the ways in which the QFT™ can and, in fact, has influenced and impacted the inquiry learning of young, primary students, many of these open-minded and progressive educators are now asking the question, “How can I begin to incorporate this process into my own teaching?”

Prior to having these genuine and impassioned conversations with my colleagues, I had asked them to share some perspectives and to provide me in written form any ideas or thoughts related to the three questions on the questionnaire. Of the 21 colleagues to whom I had sent the voluntary and anonymous questionnaire, I received powerful and thorough feedback from more than 50% (11 in total). To respect the privacy and anonymity of these educators, the information was sent directly to
an assigned third party who then transcribed the information in digital format, removing any reference to a specific grade or teacher and replacing it with the generic term, ‘elementary teacher’ and ‘at my grade level’.

Using the same process that I applied to organize the parent feedback, the colleague responses were organized into a table (Table 4, pages 75 & 76) that allowed me to easily and systematically look at the information to determine common themes that could ultimately substantiate the need to incorporate a specific framework to help our students learn to formulate and ask more meaningful and relevant questions.

<table>
<thead>
<tr>
<th>Question</th>
<th>Categories</th>
</tr>
</thead>
</table>
| 1. *In what ways are we already teaching student questioning?*          | • Modeling question creation and reflecting on usefulness  
• Reviewing and improving upon questions  
• Encouraging students to wonder and formulate questions based on wonderings  
• Leading with effective teacher questions  
• Use of wonder walls, anonymous question boxes and ‘parking-lot’ for burning questions  
• Direct instruction  
• Validating and valuing questions  
• Peer and teacher editing of questions  
• Displaying visuals and meanings of different types of questions |
| 2. *In your opinion, what do you feel we could be doing to improve student questioning?* | • Safe/non-threatening environment that stimulates curiosity and questioning  
• Increase learning opportunities that meet the needs and interests of students  
• Deeper understanding of the inquiry cycle (both students and teachers)  
• Direct teaching and modeling of questioning skills including the importance of asking questions  
• Professional Development opportunities to deepen teacher awareness of new strategies |
3. How do you feel that a specific framework/protocol for teaching student questioning could impact the inquiry process for our learners?

- More student-directed inquiry and less dependency on teacher questions
- Questioning as a learning strategy across disciplines
- Stronger home and school connections
- Time commitment for developing needed skills

- Needed skills for students to question more
- Repetition and daily practice through direct teaching
- Clear direction and purpose
- Concrete and consistent approach between grades/teachers
- Deepens student inquiry/learning as students take more responsibility with the questions they ask
- Develops teacher confidence with the inquiry process
- More ownership = more engagement = quicker understanding

Table 4 – Common themes from colleague responses to the Questionnaire (Appendix C)

Through the lens of action researcher, what I found interesting after considering the colleague responses was that essentially there was a consensus that we are making many positive strides to develop the inquiry skills of our students, that we could always get better and that we should consider alternative means to achieve the same end. In other words, we are doing a great job, but there is always room to improve, and, further, as responsible educators, it is incumbent on us to seek out and incorporate these strategies into our daily and best teaching practices.

In many of the responses, teachers agreed that a deeper understanding of the inquiry cycle for both students and teachers was critical and that as teachers at the elementary level, we must put a stronger emphasis on, as one of the respondents noted, “developing the real meaning of student-driven inquiry”. With respect to the skill of question formulation and development, the driving focus of this study and one that according to one colleague “should not be assumed in our students”, teachers clearly indicated this as a skill that, “needs to be taught through direct instruction” and further should be “routinely practiced” in order for the students to become more proficient at this craft.
It should be noted that many of the teachers discussed the element of time as a factor that far too often restricts the amount of or depth of work that we can achieve with our students. Although we endeavor to value what the students want to learn about, this frequently ends up being less of a focus. In other words, as one colleague eloquently stated, “as teachers, we end up doing too much of the thinking, guiding and questioning”.

It is my opinion, and certainly has been my experience as a teacher striving to develop the thinking and questioning skills of my students, that student inquiry was more of a response to what I expected of them. In other words, the message that I had been sending to my students was, “I hear what you are saying and what you are interested in, but I still need you to think of it this way and in this time frame”.

The rationale for teaching students to ask their own questions in order to deepen their learning by using a specific and concrete framework can perhaps be rationalized through an analogy that one of my colleagues made between teaching students how to write and teaching students how to ask questions:

“Students need a schema (in their brains) when approaching tasks. This can be used as a reference – a step-by-step approach that keeps them on track. We teach students to write well by making sure they consider their purpose, their audience. Similarly, a framework for teaching student questioning would impact students’ abilities to pose meaningful and appropriate questions. Students need repeated practice. They also need prompts. In my opinion, a framework would help accomplish this – not only would it provide a level of consistency for teachers but it would give students clear direction and purpose along with a scope of what is possible”.
Chapter Five: Summary, Discussion and Conclusions

“As teachers we are in the business of talking for a living, so it comes quite naturally to us to jump in with our own answer for the child. The trustworthiness of our inquiries will be enhanced if we can bite our tongue and wait patiently” (Mills, 2011, p. 110).

Summary and Discussion: So What? And Now What?

Mills’ notion of “less talk, more listen” has served me tremendously throughout this inquiry on student questioning. Being no stranger to talking and engaging in powerful conversations with my young learners, I found that it only took a few reminders to myself to “let them do the talking” before the narrative of this journey unfolded through the words and perspectives of the participants. Mills (2011) talks about the difficulty of recording observations and taking notes while the teaching is going on. However, he feels that it is critical to get these ideas down on paper (or in my case digital format) soon after in order to “capture the essence of what transpired” (p. 110). As a beginning researcher, I found this advice eminently helpful, a realization that I came to only as I began to further analyze and synthesize the work that we had accomplished together. The thorough and specific notes that I had recorded from the outset of this journey enabled me to convey the students’ story accurately and objectively therefore heightening the validity of this study.

As I set out on this learning journey with my students, I felt that it was my duty as a responsible teacher and researcher to think about and underline my personal beliefs about inquiry-based learning and student questioning that I believed would allow me to ground myself within the nature of the work. Among my perspectives, I firmly believed that inquiry is:

1. for all types of learners,
2. a process that involves communication and decision-making done in a collaborative manner,
3. best achieved through a process of clearly defined stages or steps and,
4. most effective when the learner asks the questions.

In essence, I was beginning to see how the learner should possess a clearly articulated set of skills that foster questioning skills along with the ability to investigate one’s questions and to express his or her knowledge or understandings. Kathy Short (1997) describes the collaborative nature of inquiry as a process in which “students and teachers figure out the curriculum together” (p. 3). Not only does Short believe that inquiry is a way to enhance student learning, but further, it is a means to create “a better learning environment for everyone” (p. 3).

Embracing this empirical inquiry stance, and as a teacher of young, impressionable minds, or as I like to refer to myself a grade two teacher, I often find myself engaged in rich conservations with other primary colleagues pondering the question, “What can we do today to ensure an authentic learning experience for our students?”

The framework of the Question Framework Technique™ (Rothstein and Santana, 2011) presented us with the perfect opportunity to explore this question when it came to considering how to enhance the inquiry cycle that we promote with our learners to develop and guide their learning experiences.

The defining components of the QFT™ resulted from the exhaustive work and research that Dan Rothstein and Luz Santana along with their colleagues at the Right Question Institute undertook when they began to consider the questions, “What happens if we don’t ask our own questions?”, and to mindfully consider and address this, “How do you build people’s capacity to do this thinking for themselves?” In a TEDx talk presented to address the need for a shift in this very mindset for teaching the art and science of questioning, Dan Rothstein asserts that the act of asking questions is
the “single most powerful renewable source of intellectual energy”; a skill set that, in his opinion, must be “deliberately taught” (Rothstein, 2012).

Having recognized that this process had the potential to significantly impact and alter the ways in which our students participated and engaged in the inquiry cycle, including initiating the process by asking the questions as well as having a hand in determining the next steps for learning, this study has, in my opinion, gone a long way in showing how this can be achieved and sustained. When I consider how I had supported the questioning skills of my students in previous years, I began to identify specific activities where the application of the question formulation technique™ has not only had a noticeable and significant impact on the students’ abilities to ask questions, but it also brings to light the importance of the teacher constructing learning opportunities that involve the students more frequently.

In considering any limitations that could possibly impact the reliability and/or validity of my study, I questioned myself, as an inexperienced teacher researcher, on how I could maintain a level of objectivity when it came to doing the work with my students. With the insight and support of my colleagues and other professionals, I quickly realized that the very nature of the work and the clarity of the QFT™ would allow me to conduct this research in a “systematic, disciplined manner” (Mills, 2011, p. 114) that would, as Mills asserts, “go a long way toward minimizing personal bias in my findings” (p. 114).

Mills (2011) further debates the validity of any action research project as he states that the true litmus test to determine its potential and practical nature is “whether the actual solution to a problem (or planned intervention) actually solves the problem” (p. 116). To better understand this in the context of my study, I simply reconsidered my initial intention, which was to examine how teaching a
specific framework to formulate and ask beginning or leading questions could deepen the inquiry experience for primary learners. Additionally, it was my further intention to demonstrate how this process could improve the inquiry learning conditions and behaviours within our small, primary school environment at the same time as helping to establish a context for this information to benefit learners in other school settings and at other grade or age levels.

Maxwell (1992) differentiates between these two notions of generalizability as internal vs. external generalizability. He defines internal as “generalizing within the community, group, or institution studied” whereas external is seen as “generalizing to other communities, groups, or institutions not directly observed or interviewed” (p. 293).

With this in mind, the following selection of comments and examples will begin to illustrate the impacts and depth of change that have resulted from asking the single question, “If we consistently engage learners in the QFT™ process, in what ways will their questioning behaviours strengthen and/or change?”

Towards the end of the school year, two of my colleagues were ready to try out the QFT™ with their learners. Having supported them closely through the various stages of the process, both of these highly skilled and experienced educators observed many noticeable changes in their students’ behaviours and willingly shared their experiences and successes. The following two highly reflective statements truly reinforce many of the observations about the impact of the process and how it was, in my opinion, enhancing the learning opportunities for my students:

“As we encourage our students to take their learning further and to be engaged in it more, we want them to have real and consistent opportunities to do that. As we model it, they feel that they are in charge of their learning. They know where it’s going and what it’s going to look like. The QFT™ gave me the opportunity to do that right away with my students. It allowed them to see that
their questions were valuable, that we were going to use them to lead our learning and to show them that they were in charge. For my part, it really helped me to understand where they were at from the outset of our unit. Instead of doing a KWL that I would typically do, we were getting them engaged in questioning to start their learning. Then, those questions helped us to know where we could go first and where we were going to take it. Showing them and modeling for them that the learning was built around their initial questions.”

A second colleague, who had expressed some initial reservations for using this process, reflected on how it quickly impacted the teaching and learning in her classroom:

“...I had watched Darren use it at the beginning with his students and was kind of intimidated by it because it seemed like a lot of work to get the students to generate the questions. But after watching the success that he was having with his students and as he was sharing it with us, I thought I wanted to try it in hopes of having my students ask more meaningful questions and also to have a tool to reflect on at the end of the unit. Although it was a bit of a struggle at first, we got some excellent questions out of them, which have helped to guide the units. Many of their questions have been embedded into the central ideas and the lines of inquiry of the units.”

Throughout the year, I had established a connection through social media and began to develop a professional relationship with the staff at the Right Question Institute (RQI) to keep them apprised of the work that I was doing with my students and to continue to learn from them. In July 2012, I had the pleasure of attending and participating in the RQI’s Summer Institute led by Luz Santana, co-author of, *Make Just One Change: Teach Students to Ask Their Own Questions* (2011). During this seminar, it was evident through my conversations with other colleagues that the role of questioning is beginning to find a more prominent place within the structures of teaching and learning in general throughout North America, and that teachers are grappling with ways to develop and incorporate alternative strategies to develop the questioning behaviours of their students. The following messages that I received from both Dan Rothstein and Luz Santana not only validated the
work that we had accomplished with our students at Sequoia Park, but further, they demonstrate how these insights and knowledge can be used to support the work of other educators:

Consequently, this on-going support has resulted in me becoming a part of a burgeoning personal learning network. Furthermore, as a direct result of the work that I have accomplished in this study, I have begun to receive queries from other teachers, at all levels, both in Canada and the United States, wondering how they can incorporate this process into their own practices.

The relative successes and impacts of the QFT™ did not go unnoticed or unmentioned by the parents of the students in my grade two classroom. Throughout the year, many of these parents expressed great appreciation for how this ‘new way’ or ‘style’ of learning had completely transformed their children and in so many different ways.

After the students completed and presented independent inquiry experiments during our unit on Matter, one of the parents spoke about all the learning that happened in the process of preparing the experiment at home including the discussion and the desire for their child to be independent in organizing and looking for information to answer his inquiry question. The same parent added, “I sat back in awe of my child as he completely and independently navigated through his own learning”.

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Referring to the same inquiry project, another parent shared how their child had struggled with her experiment, yet, at the same time, how impressed they were with their child’s ability to express how she was feeling about it and what she could do to make the situation better. When the parent was about to suggest considering a different approach or even find another experiment, they were taken aback when their child said, “I don’t think it’s a good idea to give up. I just need to think of a different way to look at it”.

Finally, two different parents of students were in complete disbelief by the end of the year at how their children had become such strong communicators. One parent talked about how the research their child was doing during the Mapping unit had enabled her to develop a stronger sense of herself as a learner and how her developing confidence was allowing her to share her knowledge with her classmates, something both her parents claimed, “she had never done before”. A second family talked about their child’s increased engagement at school as well as a desire to explore so much more at home. This parent was beaming with pride when they claimed that this has enabled them to build stronger communication with their child “especially when it comes to talking about her learning”.

Among the many activities that we did to explore and investigate the students’ questions and investigations, very few were as informative as the reflection piece. Rothstein and Santana (2011) believe that student reflection within the process of the QFT™ serves to “reinforce learning, strengthen metacognition, and ensure continued application” (p. 120). Barell (2008) further contends that “if we want our students to be intellectually and emotionally engaged and to grow in their abilities to differentiate, compare and contrast and draw on prior learning, it stands to reason that we would offer them many and varied opportunities to become good, reflective observers, keen watchers, capable distinction makers within all subjects we teach” (p. 35).

At the end of our unit of inquiry on Matter, the following example will demonstrate how I was
able to assess the students’ developing understanding of their original questions. At the beginning of the unit, they had generated questions using the Qfocus “Matter is everywhere and can change over time”. At this point, the students were asked to choose two of the questions from the original list (which had been posted on our inquiry wall throughout the unit), and, for each question, they were encouraged to provide, during a one-on-one interview, some of their thoughts or perspectives that would demonstrate some of their learning accomplished during this unit of study.

Here are a few examples of student comments in response to the following three verbal prompts:

A. Choose two questions that you know more about since the beginning of this unit
B. Tell me some things that you know now that you didn’t before about each question
C. Explain how you learned this new information

One student felt that she knew much more now about the question “What is matter?” She suggested in her response to Prompt B that, “Everything is MATTER! MATTER is made up of three states: solid, liquid and gas. A solid is like a table, liquid is like water and gas is like $O_2$.” The reason she thought this was because she had “read about MATTER in books and learned about it in the class from watching other people’s experiments”.

Another student was eager to talk about the question “Why is it everywhere?” Expressing an advanced understanding, she confidently shared that “Matter can be from a piece of dust in space to a star in the galaxy so far away that no one could ever go that far away”. When I asked her if she had learned that in class or whether someone had shared that during one of the inquiry experiments, she simply smiled and added “No, my dad and I talk about matter all the time and we find out about lots of cool things”.


The final example from this reflection activity shows how two different students were able to gain a deeper understanding of the concept of change in the central idea by choosing the question “How does matter change over time?” However, their responses illustrate two very different ways that they arrived at the same level of understanding. This first student talked about the idea that “when solids get too hot, they can turn to liquids”. He went on to provide a specific example that “when you put ice in hot chocolate, the ice gets too hot and so it will turn to H₂O in the hot chocolate”. Just when I was about to thank him for the great insights, he added, “And after a little while, the H₂O moves around the hot chocolate and makes it cold”. I tried not to show my surprise when the second student began to talk (with scientific authority) about the changes in the human body. She talked about how her brother was learning about the body in his unit of inquiry and that they were “talking a lot about it at home”. I was further left in awe when she rhetorically asked me to “think about how a little baby would change so much by the time it got to be her grandma’s age”.

Listening to and reflecting on these powerful comments and feedback from the students, it would be easy for me to say both as classroom teacher and teacher researcher that the number of positive changes I have begun to notice in these young learners are simply and directly the result of implementing the QFT™ process. Although I have continued to observe a number of these changes in the students’ questioning skills and behaviours, I would be remiss not to recognize that the sum total of change and success in our students’ learning is the result of the overall process that is cultivated on a daily basis among the entire school community.

Before the end of the school year, I wanted to garner some final thoughts from the students about why they like asking questions and why they felt it is important for people to be able to ask questions. After listening to their ideas about how it helps people ‘learn’ and ‘get smarter’ and ‘find out about new things’, the students were all eager to answer my third question “If you could ask any
question right now, what would it be?” The diversity and assortment of their questions, in my opinion, reinforces the need, for teachers, to listen carefully to what children are thinking and what they are interested in if we truly want them to become independent thinkers and inquirers:

- Why is our unit of inquiry on perspective? (student 1)
- What is the planet Pluto made out of? (student 2)
- Why doesn’t everyone have clean water? (student 3)
- How do you get to the bonus level in Sonic Colors? (student 4)
- How many people are there in this school? (student 5)
- What was the first planet that formed in the galaxy? (student 6)
- When will we get to learn multiplication? (student 7)
- Did dragons once live on Earth? (student 8)
- How big is North America? (student 9)
- Why do vampires only drink blood? (student 10)
- How many different kinds of crabs are there? (student 11)
- Will I pass my karate exam tomorrow? (student 12)
- Why are questions called questions? (student 13)
- How many more days until summer break? (student 14)
- Why did we go to the Art Gallery yesterday? (student 15)
- Will we get to use the iPads to do research today? (student 16)
- What is your favourite number? (student 17)

Conclusions: Seeing the plan through

Always striving to be one of those great teachers in one of those great schools who help to challenge and push the boundaries of thinking and learning, I believe that one of the easiest yet powerful ways for us to accomplish that is to be constantly asking questions of ourselves and of our beliefs about our current practices and perspectives around teaching and learning. Rather than trying
to create a situation that was beyond how I saw myself as an academic, or adult learner, I made the informed decision to focus on something that was meaningful to both myself as a teacher/learner and to my students as learners. The moment I came to this realization, I subsequently determined that the best approach to achieve this end was through action research.

My goal through this study was to examine students’ understanding of and motivation to learn through questioning, and, more specifically, if or how assuming more responsibility for asking questions and co-constructing learning opportunities would increase their capacity as learners, as inquirers at the early primary level.

Having completed this illuminating and informative action research project, I feel confident that the essential elements that comprise Rothstein and Santana’s (2011) Question Formulation Technique™ are the perfect complement to a classroom or school who teach from an inquiry stance. My experience with this process throughout the course of this study has shown how the QFT™ can be most beneficial and advantageous to these young learners when it is used to initiate, guide and sustain a unit of inquiry. Moreover, the research and results of this study both indicate a higher level of engagement and motivation when the students are provided with opportunities to “own their learning” by assuming more responsibility within the decision-making process.

I feel that the results of this study were essentially achieved through a level of trust developed and supported on many different levels. For me personally, as a teacher, I put much faith and trust in the process of inquiry as the most effective means for teachers to teach and for learners to learn or acquire knowledge. For the students, it was paramount for me as their teacher to establish a great degree of trust that would allow them to take the necessary risks as learners, ultimately enabling them to flourish within this process. For the parents of the students, they have consistently demonstrated a trust for an unfamiliar way of learning, and for knowing that the school makes informed decisions for
learning based on the best interest of their children. Finally, my colleagues, for whom I have the utmost of respect, they showed a willingness to consider “a different way to do it” and to question and discuss candidly their own perspectives and practices for teaching, always in the interest, first and foremost, of improving the learning conditions for students.

In the end, the success of this study is intelligibly and distinctly told through the lens of the parents, teachers and, most importantly, the students with whom I have the extreme pleasure to learn with and from on a daily basis.
REFERENCES:


Questioning student questioning - helping primary students begin to take more responsibility within their inquiry learning (independent, small group and whole class inquiry activities)

On chart paper, I will introduce each of these questions (over 3 separate lessons) to the class. I will ask the students to consider the knowledge that they have about asking questions and suggest how this information can help us to become even better inquirers.

**QUESTION #1 – Why do we ask questions?**

**QUESTION #2 – Are all questions the same?**

**QUESTION #3 – How are questions the same or different?**
Questioning student questioning - helping primary students begin to take more responsibility within the inquiry cycle (independent, small group and whole class inquiry activities)

As you are aware from the consent form you received regarding my action research project where I will be teaching and implementing a specific protocol for student questioning, I am asking you to consider completing the following questionnaire to support my research. Ultimately, I will be analyzing all of the information collected from students, teachers and parents to look for impacts that this learning may have on the inquiry learning process for the teacher as well as the learners.

Darren Elves
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Dr. Paige Fisher
Supervisor Department of Education
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250-753-3245 (local: 2002)

*Please note that you are by no means obligated to answer any or all of these questions with no explanation required.

**Also, please be assured that any information from your answers that I may use in my final written submission will be completely ANONYMOUS with absolutely no mention or indication of yours or your child’s name or initials (instead, I will replace specific names/comments with a generic ‘A parent in the class’)

QUESTION #1 – Describe any changes or general observations you have noticed about your child’s QUESTIONING skills over the past few months:

QUESTION #2 – In your opinion, how do you feel questioning can help your child in his/her learning and/or daily life?
Questioning student questioning - helping primary students begin to take more responsibility within the inquiry cycle (independent, small group and whole class inquiry activities)

As you are aware, I am organizing my action research project from my final project/Thesis as part of the Master’s in Educational Leadership program at Vancouver Island University. In my research, I will be teaching and implementing a specific protocol for student questioning, then subsequently examining the data collected to explore the ways that students’ questioning skills grow and change as well as the ways that a teacher’s skills in guiding student questioning grow and change. With this questionnaire, I am asking you to consider providing your insights and perspectives around student questioning to help support my research.

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Dr. Paige Fisher
Supervisor Department of Education
Vancouver Island University
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**Also, please be assured that any information from your answers that I may use in my final written submission will be completely ANONYMOUS with absolutely no mention or indication of your name or the grade that you teach (instead, I will replace specific names/comments with a generic ‘A teacher…’ or ‘A colleague…’)

QUESTION #1 – In what ways are we already teaching student questioning?

QUESTION #2 – In your opinion, what do you feel we could be doing to improve student questioning?

QUESTION #3 – How do you feel that a specific framework/protocol for teaching student questioning could impact the inquiry process for our learners?