A Preliminary Exploration of Students’ Perceptions of Their Own Learning

by

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A thesis submitted in conformity with the requirements for the degree of Master of Arts
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Ontario Institute for Studies in Education
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Abstract

Students acquire knowledge in the classroom from a variety of sources, such as the teacher, learning activities and the academic environment. Yet, there is limited research on student perceptions of their own learning in the classroom. This study is a preliminary investigation of how students aged 8 to 12 think they learn best in the classroom. A sample of 229 students answered the question ‘how do you learn best at school?’ Out of the 229 responses, 210 responses were used. Thematic analysis was used to examine student answers. The results demonstrated that students were able to recognize different relationships within the classroom that help them learn best. Areas defined include classroom tools, classroom management, and student readiness. Findings support that students were aware of their classroom environment and how it can affect their learning, whether it be in a positive or negative manner.
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Chapter I
Introduction and Literature Review

Recognizing how elementary students comprehend their own learning allows educators and researchers to understand how knowledge is acquired. The investigation of student learning influences teachers' decisions to recognize how to teach students new academic concepts (DeMarie, 2010; Frye & Ziv, 2005). As well, researchers can identify cognitive processes and environmental stimulus that can influence a student’s ability to learn (Hofer, 2001). An academic environment such as the classroom impacts academic growth as it builds a foundation of learning which can be influenced by the interaction of peers, staff members, and the curriculum (Hofer, 2002; Zhang, Hong, Scardamalia, Teo & Morley, 2011).

There is much research on adult interpretation of student learning (Bartsch, Horvath, & Estes, 2003; Olson & Bruner, 1996), student learning strategies and styles (Armstrong, 2009; Boström, 2012), and student interpretation of where knowledge originates in the classroom (Bartsch, Horvath, & Estes, 2003; Brownlee, Curtis, Spooner-Lane, & Feucht, 2017). However, research on how students themselves think they learn best is limited. Student opinions and self-reflection of their own learning within the classroom can help themselves and their teachers better recognize how knowledge originates (DeMarie, 2010). Exploration of student reflection allows educators to understand what aspects of the classroom students describe as helping them learn best. The main purpose of this study is to provide a preliminary analysis on how elementary students think they learn best in the classroom.

In this section, student thinking, theories of epistemological development concerning how students develop knowledge and interpret their own learning will first be reviewed. Second, relationships within the classroom influence student learning, hence different contexts
of the classroom environment will be evaluated. Finally, by working with children to find out about their learning in the classroom, the benefit of capturing student perspective will be discussed. In this thesis, *student* represents children and adolescents in school settings. *Child* or *children* classifies a stage in a progression of human development. These will be further elaborated upon in explanations of childhood learning.

**Epistemological Development**

Through daily interactions with different environments, children begin to acquire knowledge and form an understanding of what is considered truth, termed *epistemological development*, and validate it within their personal interactions and understandings of the world (Brownlee, Curtis, Spooner-Lane, & Feucht, 2017; Hofer, 2002; Magrini, 2010). Examples of epistemic cognition include personal definitions of knowledge, knowledge construction and evaluation, origin of knowledge, and the occurrence of knowledge (Hofer, 2002). Perry (1970), Belenky, Clinchy, Goldberger, and Tarule (1986) and Baxter Magolda (1992) are some of the many theorists that have explored diverse areas of epistemological development, by organizing different stages and varying levels of thinking. Areas of epistemological development include: epistemological reflection, intellectual development as well as gender difference in epistemological thinking (Hofer, 2001; Hofer & Pintrich, 1997). This thesis focuses on epistemological development within elementary students’ learning, in relation to self and knowledge development.

One model of epistemological development in learning and knowledge development was studied by Schommer (1990), who examined the relationship between an individual’s knowledge development and their academic performance. Schommer identified personal epistemology to be guided by a set of independent beliefs, that are multidimensional and do
not necessarily correspond with each other (Duell & Schommer-Aikins, 2001). Examined by Duell and Schommer-Aikins (2001) the epistemic beliefs proposed by Schommer (1990) involve: (a) *structure* (is knowledge integrated or isolated); (b) *source* (is knowledge solely constructed or from external sources); (c) *stability* (is knowledge stable or consistently changing); (d) *ability to learn* (is it a predetermined innate ability or can effort help the learning process); (e) *speed of learning* (does learning happen quickly or not at all).

Schommer then developed a 63-item questionnaire as reviewed by Hofer & Pintrich (1997) that generated a continuum of four factors comprised of *fixed ability* (intelligence is fixed versus set increases), *quick learning* (learning happens quickly or not at all versus gradual learning), *simple knowledge* (knowledge as isolated versus interrelated) and *certain knowledge* (knowledge as concrete versus exploratory).

The importance of knowledge development and academic connection is the varying dimensions amongst each individual student as well as each academic population of students. According to Schommer’s (1990) theory it cannot be assumed that a student’s knowledge and epistemic beliefs are consistent with each other. An example is that an individual can have epistemic beliefs that “knowledge is certain and unchanging and at the same time espouse beliefs in the source of knowledge as internally constructed” (Brownlee, Curtis, Spooner-Lane, & Feucht, 2017, p. 195). Additionally, past research using Schommer’s (1990) theory focused on post-secondary students, however more recent studies were done with preadolescent and adolescents (Schommer-Aikins, Duell, & Hutter, 2005).

Children’s developmental process of reflection, argument, and establishing what they understand starts a few months after birth (Patnaik, 2008). A child’s ability to acquire knowledge and form judgement is connected to the theory of mind (ToM) as it is a main
facilitator of epistemological development and understanding. ToM requires an individual to self-reflect and imagine that others would have similar feelings to theirs depending on a given situation. One concept that helps determine a child’s ToM development is false-belief. False-belief is a child’s ability to understand that other individuals can have beliefs, views, and mental states that differ from one another (Wellman & Lui, 2004; Wimmer & Perner, 1983).

According to Clinchy and Mansfield (1985, 1986) and Mansfield and Clinchy (1987, 1997) children as early as four years of age demonstrate that “knowledge is not simply absorbed, but rather constructed by people with individual personalities and unique pasts” (as cited in Chandler, Hallett, & Sokol, 2002, p. 154). By five years of age, children comprehend that all individuals have their own representation of the world and mindsets which they use to act upon when dealing with situations (Astington & Pelletier, 1996). Researchers Wang, Wang, and Chui (2017) suggest that the influence of ToM development towards a child’s view on their academic learning and how they learn provides students with a higher mental reasoning to “process teacher’s intention and reflect on their learning” (p.2). Additionally, when students participate in their everyday learning experiences they may practice, interpret their learning, using a higher mental state reason which further advances their ToM development (Wang, Wang & Chui, 2017).

A model of epistemological development reviewed by Hofer (2001) is the theory of argumentative reasoning. This theory establishes four levels of argumentative reasoning and judgement: realist, absolutist, multiplist and evaluativist (Kuhn, 1991). These levels were originally for adult participants, but were later applied to participants ranging from childhood to mature adults (Kuhn, Cheney & Weinstock, 2000). The authors’ viewed epistemological development and understanding as the ultimate “coordination of the subjective and objective
dimensions of knowing” (Kuhn, Cheney, & Weinstock, 2000, p. 312). Objective dimensions rely on facts while subjective dimensions are based on personal, aesthetic judgements (Hofer, 2001; Kuhn, Cheney, & Weinstock, 2000). Early in development, children follow an objective lens, yet as they mature, the subjective frame of thinking dominates until both dimensions of thinking are balanced and coordinated (Hofer, 2001; Kuhn, Cheney, & Weinstock, 2000).

The development of argumentative reasoning as the assertion of an individual’s ideas follows the four reasoning levels and includes individual perspectives of knowledge, education, and their environment (Kuhn, Cheney, & Weinstock, 2000; Kuhn & Park, 2005). Theory of argument can be present in the classroom through different learning activities (such as debates, group work and individualized assignments) or through daily classroom interaction (teacher providing students with new knowledge). Individuals can copy ideas (realist), state facts (absolutist), hold their own opinions (multiplist), and judge others (evaluativist), yet the formations of ideas will develop as a child’s cognition matures. Due to the preliminary nature of this study, Schommer’s (1990) and Kuhn’s (1991) theories of epistemological development to conceptualize student learning are beyond the scope of this thesis, as other aspects of the classroom are examined.

Chandler, Hallett, and Sokol (2002) collected multiple analyses of epistemological models and organized them into developmental categories ranging from preschool to adulthood. One study examined diversity of belief of children ages five to nine years using Kuhn and colleagues’ (2000) levels of reasoning (Wainryb, Shaw, Langley, Cottam, & Lewis, 2004). Results demonstrated that children at the age of five were using more fact-based reasoning (absolutist) and their own judgements, yet children younger than five were already participating in defending their beliefs while tolerating or endorsing others (Wainryb et al.,
Particular to preadolescents, Clinchy and Mansfield (1985, 1986) and Mansfield and Clinchy (1987, 1997) found that children at the age of 10 “believed that diversity of opinion was legitimate” (Chandler, Hallett, & Sokol, 2002, p. 154). Children also recognize that other individuals have a range of metacognitive states that are different from theirs, and can influence actions of others over time (Astoning, & Baird, 2005; Carlson, Koenig, & Harms, 2013; Kuhn, Cheney, & Weinstock, 2000; Ziv & Frye, 2004). Mental states include knowledge, beliefs, emotions, desires, and experiences, which contribute to create another working mind (Patnaik, 2008). ToM continues to develop past preschool into a constructivist ToM, a concept that has been discussed throughout adulthood epistemology (Hofer & Pintrich, 1997) and begins to develop within preadolescents (Weimer, Parault Dowds, Fabricius, Schwanenflugel, & Suh, 2017). Constructivist ToM is the balance between two dimensions of information processing and the constructive nature of revealing information that is unclear within information processing (Weimer et al., 2017).

Research completed by Weimer and colleagues (2017) connected false-belief to constructivist ToM as children aged 10 to 12 were able to identify that an individual’s different cognitive processes (such as attention, comprehension, memory) will affect their cognitive outcomes, even when students are provided the same experience. Finally, Mansfield and Clinchy (2002) noticed that adolescents move toward a more subjective and constructivist ToM (as cited in Chandler, Hallett, & Sokol, 2002). Maturity of ToM and epistemology allows students to develop knowledge construction and processes, thereby able to defend and become self-reflective on their own thinking and how they learn best at school. The study of metacognition and metacognitive language is one way to examine ToM and epistemological development.
Flavell (1979) defined metacognition as the human ability to be self-reflexive and the study of an individual’s examination of their own thinking (Fisher, 1998; Pramling, 1988). One way of describing properties of the mind is through language: a form of communication that expresses information of an individual’s mental state and perspective on the world (Astonington, & Pelletier, 1996). When children develop metacognitive language and skills, it can be crucial to help them learn about their own learning (Boström, 2012; Pramling, 1988). Teachers offering opportunities for students to reflect on their own or new knowledge in a set learning context is an example of how metacognitive language or skills can develop (Boström, 2012; Pramling, 1988).

Student epistemological development, ToM, and metacognition all share the importance of self-reflection, the development of knowledge, and students’ opinions of both themselves and others around them. In a classroom setting, both Schommer’s (1990) and Kuhn’s (1991) theories offer an approach to how students conceptualize and form knowledge, depending on a certain time in their development. Chandler, Hallett, and Sokol (2002) as well as Weimer and colleagues (2017) view ToM development as an influence on student’s epistemological growth – the shift from childhood to adolescent development is demonstrated through explanation of complex knowledge construction. In classroom education, knowledge construction is classified into different knowledge structures and dimensions, which then influence other areas of child development (Ferrari & Vuletic, 2010; Kuhn, Cheney, & Weinstock, 2000; Muis, Bendixen, & Haerle, 2006). A student’s ability to gain and construct knowledge is influenced by multiple aspects of the classroom and the students’ further reflection of their own learning.
Classroom Influence on Learning

Three main aspects of the classroom that contribute to students’ learning are the classroom environment, classroom culture, and other individuals in the classroom (Brownlee et al., 2017; Felix, 2005; Peterson et al., 2011). The classroom encompasses the reflection of students’ and teachers’ shared perceptions of the environment. Examples include teacher and peer support, equity, student cohesiveness, classroom management and involvement (Lampert, 1990; Pickett & Fraser, 2010; Rogoff, 2003; Schoenfeld, 1988; Winitzky & Kauchak, 1995). As well, classroom tools (Daniels & Shumow, 2003) are used to help teachers and students learn knowledge in the classroom. The classroom environment can also extend to school administration and staff initiatives to promote knowledge development (Zhang et al., 2011). Whether the classroom environment is structured to ‘guide’ or ‘lead’ students’ to learn a new concept, there will always be associated learning that transpires (Ricci, 2011).

Recently, technology has been identified as an important component of classroom environment. The multiple directions technology has explored involve creating online collaborative opportunities for learning, supporting different areas of learning as well as assisting in knowledge acquisition (Collins & Halverson, 2010; Nisselle, Hanns, Green & Jones, 2012; Tang, Li, Hsin & Tsai, 2016). Instruments such as tablets, laptops, SMART boards, and other online communication tools have allowed individual participation and collective learning to take place inside and outside the classroom setting (Ricci, 2011; Williams, Karousou, & Mackness, 2011). Additionally, these instruments introduce further development of technology assisted learning such as reading and math applications (Tang, Li, Hsin & Tsai, 2016). According to research (Tang, Li, Hsin & Tsai, 2016) technology is focused on the development and outcomes of learning applications that support individuals with learning difficulties rather
than considered as a source of knowledge activation when examining classroom learning. Due to the increase in the use educational technology and programming in the classroom, technology is perceived to be an external form of knowledge activation to create new possibilities, thereby evolving how learning takes place in the classroom (Brownlee, Curtis, Spooner-Lane, & Feucht, 2017; Collins & Halverson, 2010).

Classroom culture includes the continuous development of learning strategies and teaching approaches that affect classroom dynamics. Felix (2005) observes chronological changes in the roles that students and teachers play as they participate in knowledge construction and learning in the classroom. For instance, changes in student and teacher roles happen naturally as children get older, such that teaching and learning appear different across development. Education in recent times has become more inclusive, flexible, and collaborative while previous generations may have experienced education from a unidirectional relationship from teacher to student (Townsend, Clarke, & Ainscow, 1999). According to Olson and Bruner (1996), educational practices are based on a set of notions about the student’s mind, creating a humanistic approach to learning. These shifts in educational practices, student population, classroom environment, and teacher collaboration meet new demands that follow an inquiry-based education and active learning approaches (Caswell & Bielaczyc, 2002). Such approaches may include providing more in-depth feedback to students, multiple activities to exercise knowledge building (Zhang et al., 2011), and providing more opportunities for students to become facilitators of their own learning (Felix, 2005).

In the classroom, key individuals (teachers, parents, students) influence student learning, each of these parties holding distinctive perceptions as to who is most responsible for
students’ academic achievement (Peterson et al., 2011). Peterson et al. (2011) reported two major findings: (1) both students and parents placed blame for student failure on the teacher, while teachers placed blame on students and their parents; (2) all participants emphasized the importance of student-teacher relationships as determining student success. It was concluded that teachers are sometimes recognized as being fully responsible for student learning or are acknowledged as being responsible because of the ‘teacher’ role (Peterson et al., 2011). However, other factors such as parental influence both outside and inside the classroom, student motivation, school environment, student SES, and student individual characteristics all contribute to how students learn in the classroom (Georgiou, 2008; Peterson et al., 2011; Saunders-Stewart, Gyles, Shore & Bracewell, 2015). These factors can affect each student perception of how they think they learn best as they are influenced by factors that can alter and mature their thinking.

The teacher is responsible for creating a variety of activities that effectively pass on knowledge to students, and provide support for students as they create knowledge connections across multiple academic concepts (Frye & Ziv, 2005; Pramling Samuelsson & Pramling, 2013). The teacher-environment interaction helps students develop further knowledge, more complex thought processes, and lifelong learning skills for both inside and outside the classroom (Hofer, 2001). Teaching behaviour also includes beliefs about the learner’s epistemological development; a student’s thinking can be influenced depending on the subject of study (Muis, Bendixen, & Haerle, 2006). School subjects can require practical application of knowledge (e.g., apply to real life situations such as social studies) versus theory-based knowledge (strictly working with theory, e.g., math). Other teaching behaviours can include philosophies of how students learn, which is demonstrated through learning styles and
strategies (Armstrong, 2009; Boström, 2012; Olson & Bruner, 1996). Considering teaching beliefs and practices provides researchers an opportunity to examine how children reflect on their learning. Thus, teachers are influential as they practice teaching behaviours, cater for different learning styles, and use multiple aspects of the classroom to further develop student learning.

Learning styles acknowledge that each person can learn, yet does so in different ways at differing levels (Armstrong, 2009; Boström, 2012). Preference of learning styles is noted to be a “combination of both biological and learned patterns, which means that identical methods, environments and materials are effective for some individuals but ineffective for others” (Thies, 1999-2000, as cited in Boström, 2012, p.13). Conversely, learning strategies are a conscious or unconscious effort to use various skills to accomplish a learning task which can be taught or organized by the individual (Boström, 2012; Patnaik, 2008; Schumaker & Deshler, 2003). The combination of learning styles and strategies help students and teachers further identify what could help students learn in the classroom. An example of a North American theory of learning is the theory of multiple intelligence (MI) created by Howard Gardner (1983) as it defines intelligence outside the traditional IQ score (Armstrong, 2009). Currently there are eight established intelligences (e.g., interpersonal, logical-mathematical, naturalist) that each student possesses, and Gardner (1983) notes that students excel in one or more key MIs beyond other intelligences (Armstrong, 2009). Each style of MI proposes different strategies to help students learn to their fullest ability, depending on their individual MI strengths.
Benefits of Capturing Children’s Perspective in the Classroom

Information about student learning and knowledge development in the classroom can be summarized from the interpretation of adults such as teachers and researchers. However, capturing children’s voices in the classroom allows students the power to express how they feel about their schooling experiences. Authors Laws and Mann (2004) summarize three areas that would benefit from gathering children perspective: to children, the research and society. When children participate in research it offers them the opportunity to bring their own experiences forward, their concerns to be taken seriously and become a voice of change (Laws & Mann, 2004; Mitra & Serriere, 2012). During the data collection process it is important to make sure students are comfortable, such as building a good rapport, as a research limitation could be students matching their responses to what the adult or teacher wants to hear (DeMarie, 2010; Mitra & Serriere, 2012). Yet, by making children their own advocates, the research shifts to working with children as opposed to conducting research on children (Woodhead & Faulkner, 2008). Conducting research with children respects their experiences as children, and underlines the importance to not misconstrue their unique experience (Laws & Mann, 2004; Nilsson et al., 2015). It is also crucial how researchers approach and inform students about wanting information from them, explaining consent and the right to withdraw at any time from any method of data collection (Dockett, Perry & Kearney, 2013; Phelan & Kinsella, 2013). This gives students power to become active members in their own knowledge and experiences as students choose what they want to share.

The methods that are used to capture student voices must depend on the student’s developmental age, environment and students’ understanding of the different measures when collecting perspectives (Nilsson et al., 2015). Methods to collect students’ perspectives can
include drawings (draw, write and tell), interviews (individual, group, open or semi-structured), photographs, audio and video recordings, observations and self-reports (Brownlee et al., 2017; DeMarie, 2010; Mitra & Serriere, 2012; Nilsson et al., 2015; Quinn & Owen, 2014). Data collection methods influence research benefits by offering children a way to provide new insights into a subject area, limiting chances for adult interpretation, as well as improve data quality by narrowing focus and providing honest clarification to interpreting data (Laws & Mann, 2004).

Lastly the societal benefit of engaging children’s participation in research can be broken down into different sectors such as changes to the classroom, to the whole school, or even at policy level. Through classroom changes, Quinn and Owen (2014) demonstrated the importance of children’s recognition of being competent social actors involved in the education process. By encouraging students to be active members in this study, students and teachers were able to engage authentically in discussions of issues that mattered most to them (Quinn & Owen, 2014). Regarding whole school changes, research by Zhang et al (2011) demonstrated through a school-wide implementation of Knowledge Building (KB) initiatives in elementary classrooms, in which results revealed that students, by using reflections, self-reports, took control of their own learning and understanding through class-wide brainstorming. Teachers continually improved their execution of lessons using KB initiatives, supported by the principal who facilitated an environment for community knowledge development. By using self-report students' opinions and experiences were taken into account, confirming whether or not they felt supported during the KB initiatives (Zhang et al., 2011). Lastly, policy benefits were achieved by offering children an opportunity to contribute their
considerations to issues that influence them within the community (Dockett, Kearney & Perry, 2012; Laws & Mann, 2004).

**Current Study and Objective**

Through education research, the adult perception and understanding of how students learn and acquire knowledge within the classroom has been well established. However, the recognition of students’ thinking of their own learning is limited (Bartsch, Horvath, & Estes, 2003; Boström, 2012; Pramling, 1988). Providing opportunities for students to reflect on their learning experiences, allows students to grasp how they construct knowledge in the classroom. This thesis posits that student voice offers power; students become active members of their own knowledge and experiences when they choose what they want to share. Allowing students to reflect on and interpret their own learning is extremely beneficial for teachers and educational practitioners since it offers further insight into what is beneficial or mitigates against students’ own knowledge development (Boström, 2012; Greene & Hogan, 2012; Pramling, 1988). Boström (2012) cautions that in some cases, students’ interpretation of their learning can occasionally be an overrepresentation as they may not be true to the reality of how they actually learn in the classroom. Thus, students may interpret expectations of their own learning in one way, but actualize it in another. Overall, capturing student voices in the classroom allows students to exercise power to express how they think they learn at school, and by doing so, reveal their true feelings about their school experience. This thesis provides a preliminary investigation of how students think they learn best at school by examining the perceptions of students aged 8 to 12 years. Working with child-directed data collection methods, this study captures student perspectives and analyzes the data using thematic
analysis to provide insights to the main research objective as formulated in the following question:

1. In the existing literature, how do student responses distinguish individual relationships and the classroom environment as helping them to learn?

The objective of this thesis is to identify aspects of the classroom environment that students identify as helping them to learn. Using student data and the existing literature I predict that student responses will highlight different learning outlets of multiple aspects of the classroom. This objective also provides an opportunity for students to reflect on how the classroom environment supports or distracts them.

Chapter II

Method

Data for this thesis are extracted from a continuing longitudinal research study that is investigating the implementation and influence of full-day kindergarten in Ontario schools. The goal of the larger study is to investigate the longitudinal impact of full-day kindergarten on students, their parents, and school staff. The research started in 2010/2011 when play-based full-day kindergarten was implemented across Ontario. Two cohorts of students were followed from the beginning of JK and SK to Grade 2. For more information about the larger study please refer to (Pelletier, 2014; Pelletier & Corter, 2018).

The second round of data collection began in 2015 working with students who had completed the first part of the study to Grade 2. The direction for this extension was to examine the impact of full-day kindergarten on longer-term outcomes into middle childhood. For this part of the research, data collection was completed in 2016/2017 when students were in Grade 3 to 6. As part of the larger study on social and academic outcomes, students were
interviewed every year about school. When children were younger they were asked to
describe their school day, what they liked best at school, what was important, and how they
would solve several social challenges, such as sharing. When children reached Grades 3 to 6,
the interviews tapped similar understandings, and were extended to probe not only what
children thought was important to learn at school, but also how they believed they learned
best. The goal of asking this last question was to uncover the kinds of strategies children
reported in their learning including the role of the educator, the role of peers, the role of child
centeredness in the environment and the role of metacognitive awareness. The purpose of the
present research is to examine these epistemological understandings by considering students’
responses to the following question: How do you learn best at school?

Participants

From 18 elementary schools in the western part of the Greater Toronto Area in
Ontario, Canada, 229 participants (51% female, 49% male) were included in analysis. The
sample was comprised of 65 grade three students (mean age = 108 months), 53 grade four
students (mean age = 121 months), 58 grade five students (mean age = 132 months), and 53
grade six students (mean age = 143 months). Thirty-seven percent of this sample were
considered English-language learners but competent enough in English to participate in the
research beginning in kindergarten.

Procedure

As part of the larger study, students were withdrawn from the classrooms to take part
in a series of research tasks which included an interview. Students were asked two interview
questions regarding their perspectives and understanding about what they enjoyed best about
school and about how they learn best at school. The researcher transcribed the students’ answers which were then coded.

**Coding**

Data were coded by trained graduate students. Qualitative data in the form of child interviews were first transcribed and then interpreted using the six phases of Braun and Clarke’s (2006) thematic analysis model: Familiarization of the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report. Data were reviewed to examine how students identify their learning through individual relationships and through engagement with the classroom environment. Examples of responses and emergent themes included: influence of the classroom environment, tools, learning from others and internal motivations for learning. Working with young students offers a new challenge in accurately interpreting their voices, and can result in voices being unintentionally misrepresented; researchers differentiating between hearing a student’s perspective versus taking a student’s perspective (Nilsson et al., 2015). There is a distinction between having a student’s perspective and taking a student’s perspective. This phenomenon is described as a continuum by which adult researchers view students through their own perspectives, as opposed to allowing students to own their own perspective and experiences (Nilsson et al., 2015). These misrepresentations were considered through the coding process.

**Chapter III**

**Results**

**Student Perceptions of Learning in the Classroom**

The first objective was to explore how students ages 8 to 12 perceive individual relationships and the classroom environment as helping them to learn. A qualitative analysis
was conducted through participant responses to the question “How do you learn best at school?” Following Braun and Clarke’s (2006) thematic coding model, a category creation analysis was completed with 210 student responses. Nineteen responses were not included in the analysis because although the responses mentioned factors of learning, they did not necessarily show how they used different relationships in the classroom. Such student responses included information on favorite subjects/grade, disclosing that they did not understand the question, and explanations that they did not know how they learn best. With the remaining 210 student responses three over-arching themes, ten subthemes and four interacting themes emerged from the analysis: personal factors (metacognitive, attitudes/perspectives, behaviours), environmental factors (classroom set-up, management, tools, technology), interpersonal factors (teacher, educational support staff, peers), and interacting themes (thinking tools/strategies, academic clubs, student readiness, concentration devices) (see Figure 1).

**Figure 1.** Themes of student responses indicating how they think they learn best at school.
**Personal factors.** One factor that emerged from student responses to reflect personal preference focused on *metacognitive* functions such as: working independently, repeating lessons and concepts with homework and questions, making lessons fun, allowing themselves to restructure knowledge, and questions to better understand what is being taught. *Attitudes and perspectives* included the ability of students to choose to participate actively in lessons, how conscious they were of their feelings, and an awareness of the importance of having proper amounts of sleep. This factor also sought to demonstrate how students are aware of when to remove themselves from distracting situations in which they do not learn best. *Behaviours* from the students measured attention, focus, concentration, not ‘fooling’ around, completing homework tasks, and observing learning experiences. Students’ maturational growth and cognitive processes influence their learning environment as they reflect on of how they think they learn best. Three students best summarize this in their response:

- “Maybe by getting enough sleep, paying attention, and studying.” (Grade 5, male)
- “I learn best by making it easy to understand but also fun.” (Grade 5, female)
- “I answer the questions that the teacher gives me and I’m not afraid to answer if it’s wrong.” (Grade 4, female)

**Environmental factors.** Elements of the environment involve the students’ classroom, which include *classroom set-up* described as having assigned seating arrangements and appropriate physical set-up. Considerations for *classroom management* encompasses a quiet classroom with other students not talking, no outbursts during a lesson, a lack of possible learning distractions, and a day schedule provided to students outlining activities and learning. *Classroom tools* include rulers, highlighters, books, whiteboards, and other classroom materials. Furthermore, technology such as, YouTube, laptops, computers, videos, and
SMART boards are categorized as environments, as students manipulate these forms of technology for learning. The following statements reflect students’ thoughts on environmental factors:

- “When people are concentrating and then people have to stop the lesson and that it distracts me but when its quiet that’s how I learn best.” (Grade 3, female)
- “When I see a schedule I know what is going to happen so that’s how I learn best at school.” (Grade 4, male)
- “Best by looking at the SMART board. It’s so bright it catches my attention.” (Grade 5, male)

**Interpersonal factors.** This theme emerges from an observation of the interpersonal relationships that happen between teachers and students, educational support staff and students, and students to students. *Teachers* influence student learning by using teaching strategies (demonstration, explanation, adaptation, providing instructions) and one-on-one assistance. *Educational support staff* was mentioned in student responses, referring to adults who help them learn best in the classroom. Finally, *students* help other students learn when in groups, interacting with each other, and having friends as a source of knowledge before asking the teacher for knowledge clarification. Interpersonal factors are reflected in the following student responses:

- “The support staff for keeping me focused.” (Grade 4, male)
- “Well I usually just ask my friends because I sometimes when I ask the teacher I don’t get it. But if I don’t understand my friends I will go up to the teacher individually to understand.” (Grade 5, female)
• “When teacher tells me improvement and feedback, or when he helps me and sometimes when my classmates help me too.” (Grade 4, male)

**Interacting themes.** Interacting themes emerged from student responses that encompassed two or all three distinct over-arching themes. First, thinking tools, thinking strategies, and Gardner’s (1983) theory of MI were mentioned on numerous occasions as students thought they learn best using cognitive strategies. These tools and strategies were either introduced by teachers or used by students based on what they identified as working best for them. One student response specifically mentioned the teacher who introduced the different strategies, which may have influenced the student’s view of how students think they learn best. For this reason, the student appears to refer to both personal and interpersonal dimensions:

“We did a few months ago a survey you will fill out: 8 types of learning questionnaire so music, writing, math. So, when I did it, it said mostly math and writing. So, when I now try to do studying for a test or something that Mrs. B gave us I am best at writing so instead of reading I am making my own notes by writing notes or typing it. I am also good at math, not just math but science. This year when we did energy sometimes try to convert math into science like converting voltages into numbers and adding them up to see how much power they have.” (Grade 6, male)

Another interacting theme which emerged from one participant’s response was mention of an academic tutoring club that helped her learn. Even though the academic club is a volunteer opportunity, this experience can be categorized to have both environmental and interpersonal features:
• “There’s actually a tutoring club going on in our school and I volunteer to help others and also my teacher says if we have any troubles we can come and see him at lunch or after school” (Grade 6, female).

A student’s awareness and use of their environment to prepare for a learning experience can be a step towards student readiness. Students readiness is taking necessary steps to be better equipped with environmental tools constitutes a form of readiness to engage further in the learning activity. The concept of readiness is sorted under both personal and environmental factors because if the student is not prepared or organized to learn, the student can lose the opportunity to gain the proper learning experience. As one student stated:

• “Kinda like being prepared like pencil, paper like materials and being organized” (Grade 5, male).

Finally, several students stated using concentration devices such as music, doodling, fidget spinners, and fidget cubes help them focus in the classroom. These devices are categorized into environmental and personal factors because students are manipulating a tool to help them focus and concentrate on their learning in the classroom. Students stated:

• “There’s a thing called fidget spinners and I brought them to school and I spin them to concentrate.” (Grade 5, male)

• “Sometimes I like a fidget spinner, it helps and my homework helps me too.” (Grade 4, male)

• “Music and when people around me are not talking because that distracts me. Like music blocks the sound.” (Grade 5, female)
Chapter IV

Discussion

This thesis is a preliminary investigation of how students aged 8 to 12 think about how they learn best at school. Using student responses from the question “How do you learn best at school?”, a thematic analysis was completed. The objective was to examine student responses outlining three overarching themes defining different relationships within the classroom (classroom environment, interpersonal relationships, and personal student factors).

Discussions including the results from the thematic analysis together with general trends established through student responses, are explored in this chapter.

Classroom Relationships

Themes developed from student responses promoted how the classroom setting is filled with complex and influential bidirectional relationships. Classroom relationships that emerged from the student responses include the classroom environment, interpersonal relationships, and personal student factors. Each of the established themes are important in student learning, and one theme cannot stand on its own. These themes represent how learning in present-day classrooms can be affected by factors such as the new use of technology, development of learning strategies, teacher and peer influences, as well as having adequate materials to learn from (Frye & Ziv, 2005; Ricci, 2011; Townsend, Clarke, & Ainscow, 1999; Williams, Karousou, & Mackness, 2011).

Student responses communicated the use of classroom tools, classroom setup and management as some factors that help them learn best. Classroom tools included simple learning materials such as writing tools, books, and most recently, technology. For example,
students mentioned that writing things down helps them learn, or highlighting a textbook, and using technology (such as the SMART board or computer) to better understand a new concept.

- “Um, my support of my teachers and my highlighter.” (Grade 4, male)
- “I go on my computer.” (Grade 3, male)
- “Teacher uses electronics.” (Grade 4, male)

As students recognize the value of classroom tools, it allows them to experience a new type of learning, and offers teachers opportunities to use classroom tools for constructing knowledge (Frye & Ziv, 2005; Pramling Samuelsson & Pramling, 2013). Regarding technology, this sample of students mentioned computers, SMART boards, tablets and Internet sites such as YouTube to learn in the classroom. These findings support previous notions that technology can help students learn and gain knowledge as classroom practices become more flexible to meet student needs (Felix, 2005; Townsend, Clarke, & Ainscow, 1999). Conversely, no specific program or technology application (eg. YouTube, Powerpoint, Google Classroom etc.) was identified as helping students to learn in the classroom except for mention of the computers (machines), and the basic applications used. Similar with past research (Brownlee, Curtis, Spooner-Lane, & Feucht, 2017) educational technology from this sample is recognized as a knowledge activation source as opposed to a direct resource of support for specific academic assistance.

Students also mentioned a variety of classroom tools (Daniels & Shumow, 2003) such as fidget gadgets and even music as a way to focus and concentrate on learning happening within the classroom.

- “Sometimes I like a fidget spinner, it helps and my homework helps me to.” (Grade 4, male)
• “Music and when people around me are not talking because that distracts me. Like music blocks the sound.” (Grade 5, female)

Fidget gadgets have become popular in modern-day classrooms and appear to provide students with different ways to concentrate and focus. There is minimal research on fidget gadgets and other manipulative tools that are considered to help students concentrate. Demonstrated through this sample, it can be assumed that manipulatives may be more prominent in classrooms than previously understood. This poses the question as to whether manipulatives really do help students concentrate, or if they are simply a trend that will eventually leave classrooms.

Classroom management and setup are both factors that influence students’ ability to learn, and can presumably influence the teacher’s ability to teach. Several participating students mentioned environmental distractions as an interruption to their concentration and focus and their ability to learn in the classroom.

• “When class is quiet and there is no distractions.” (Grade 4, female)

• “When people are concentrating and then people have to stop the lesson and that it distracts me but when its quiet that’s how I learn best.” (Grade 3, female)

• “When my class is quiet and when I feel like I can focus.” (Grade 4, male)

Parallel to past research, Boström (2012) found students also reflecting on a quiet environment or needing to be able to concentrate in a quiet environment as a method to learn best. Whether students do really need quiet, non-distracting environments to learn can be implied as an integral responsibility for the teacher, that is, to manage behaviour flow in the classroom. Consistent with one study regarding teacher candidates and their understanding of classroom management (Winitzky & Kauchak, 1995), as well as a classroom environment
questionnaire discussed by Pickett and Fraser (2010), responses from the students in this current study are a good reminder that the classroom noise level and organization play a significant role in how they think they learn in the classroom. The classroom encompasses a unique set of actors (teachers and students), making the creation of an ‘ideal’ classroom virtually impossible. This is because teachers have different teaching styles and philosophies while students have diverse learning preferences. This will result in the ‘ideal’ classroom inevitably looking different for everyone, and it will take time to make it the most useful environment possible for everyone (Boström, 2012). Nonetheless, the classroom goal remains knowledge being built in an environment that works for all students.

One suggestion to better understand student perception of their learning environment is to allow students the opportunity to talk about how the classroom environment works best for them. This is an example of working with students as active members of their own experiences and opinions (Laws & Mann, 2004; Mitra & Serriere, 2012). This can be achieved by asking students questions and by engaging them in discussions about their learning environment, and the tools used to construct knowledge in the classroom (Pickett & Fraser, 2010). Teachers can also engage in metacognitive teaching by providing reflective strategies and skills to help students understand where and how they learn (Pramling, 1988).

Considering the school environment outside of the classroom, one student’s response mention learning best in an academic club infers that learning is not necessarily only possible in the classroom, but can be a common theme throughout the school environment. Thus, creating academic clubs or similar opportunities that allow learning to be expanded outside the classroom, creates an entire community of mutual learning (Zhang et al., 2011).
Reflecting on major interpersonal relationships in the classroom environment, the teacher was featured as a dominant influence in responses. A couple of student responses mentioned educational support staff as helping them to learn best in the classroom:

- “The support staff for keeping me focused.” (Grade 4, male)
- “Ms. H helps me a lot and then students in my group helps me.” (Grade 4, male)
- “I learn best by listening to the teacher and following her instructions.” (Grade 3, male)

Even though both teacher and education support staff are separated in this observation, the distinction can provide insight into how each staff member may provide different learning support to the student in the classroom. One student mentioned that the education support staff offering support when completing activities can be seen as a form of one-on-one learning intervention, while the teacher teaching the class is considered a broader learning experience. When education support staff and teachers work together, the student can conceivably benefit by developing those necessary skills to work in both individual and group learning activities. As both staff members have different responsibilities within their roles, this study discusses education support staff and teachers together as they both ultimately help students with life-long learning skills (Hofer, 2001).

Results from this study confirm findings from past research examining the role of teachers being responsible for student learning (Peterson et al., 2011) and how frequently students reference the teacher as a source of knowledge that helps them learn best in the classroom. Student responses reference teachers making lessons fun based on student interest (Daniels & Shumow, 2003), providing students feedback (Zhang et al., 2011), and creating
diverse lessons which allow students to get most of their learning experiences (Kuhn & Park, 2005; Olson & Bruner, 1996).

- “My teacher the way she says it, she says it in a fun way. She’s not so strict. She’s like, loose and makes these funny voices and she jokes around. Like she says, ‘If we had two Jacklys and 5 Sallys and we add them together, will we get 100?’ But she’s just joking around and we all say the right answer.” (Grade 4, female)

- “Visually, like if the teacher includes fun things like science experiments and stuff.” (Grade 6, female)

This unique sample of students’ responses came from different classrooms with different teachers. Classroom environments are therefore not only reflected in student responses but also in teacher professional development and understanding of children’s learning (Felix, 2005; Kuhn & Park, 2005; Pramling, 1988). Specific to teacher education, teachers’ perceptions of student epistemological development (Kuhn & Park, 2005; Muis, Bendixen, & Haeërle, 2006) and learning styles and strategies they introduce to students in the classroom (Armstrong, 2009; Boström, 2012; Patnaik, 2008; Schumaker & Deshler, 2003) influence student learning. Multiple student responses in this sample included learning “visually” or with “thinking strategies”, and one student mentioned Gardner’s (1983) theory of multiple intelligences as a way they learn best. Even when learning styles and strategies can be environmentally influenced, or a conscious effort can be made by students, teachers have an effect on the students’ form of effective learning. Specific answers that include Gardner’s MI are consistent with past analyses of how teachers influence students directly to assist them with their own philosophies of learning in the classroom (Armstrong, 2009; Boström, 2012; Olson & Bruner, 1996). These findings contribute to the literature on teacher education and
the implications of professional development when examining how children learn in the classroom.

Students’ personal factors which include cognitive processes, metacognitive functions, behaviours, and attitudes and perspectives, can affect their ability to learn. Students’ individual characteristics are conveyed as factors that assist with student learning. However, student feelings, being organized, or student concentration are all new factors found in responses that they think help them learn best.

- “Without feeling upset, without feeling angry, I guess.” (Grade 6, female)
- “Kinda like being prepared like pencil, paper like materials and being organized.” (Grade 5, male)
- “Probably just being myself and just concentrating on my work.” (Grade 5, male)

Consistent with past research, there are reports of students’ epistemological understandings and different ways of acquiring knowledge (Kuhn, 1991; Magrini, 2010; Schommer, 1990), yet not many reports have focused on student readiness, i.e., being prepared by having the proper learning tools, or feeling well rested and ready to learn. A key component from this sample of student learning is students’ reflection of mental readiness to partake in a learning activity.

- “I learn best by having my pencil in my hand to be ready to write something big that might come up on a test.” (Grade 5, male)

Student organization and the importance of preparation for a learning activity are not highlighted throughout student learning literature. This metacognitive thinking would include students’ level of cognitive engagement, student awareness of feeling prepared before or during the learning experience, and student preventatives actions that help them avoid possible
distractions for their learning. Students in this study mentioned the classroom environment as physical objects, people and themselves to show both positive and negative effects on their learning. An example includes a student’s behaviour, such as attention and focus, affected by classroom noise level as they are trying to learn. Some students even suggested to remove themselves from the distracted area because they know they learn better on their own or where there are low noise levels.

- “When my friends are talking or there is noise in the hall, I ask my teacher to move my desk so I can learn better.” (Grade 3, female)

This demonstrates that classroom management or environment can influence how students learn in the classroom (Lampert, 1990; Pickett & Fraser, 2010; Schoenfeld, 1988; Winitzky & Kauchak, 1995). Participating students demonstrated that they are more aware of how they think they learn best, which can be positive as students advocate for themselves during a time of learning (Magrini, 2010).

**General Discussion**

Analyzing student responses has raised two unique positions of how students think they learn best in the classroom. First, thematic analysis (Braun & Clarke, 2006) allowed multiple classroom relationships to emerge that were specific to the students’ own experiences (Nilsson et al., 2015). Results showed that classroom management, classroom tools, continuous development of learning styles, and student readiness can all impact students’ reflections of how they think they learn best. Second, this study has added a preliminary examination of student epistemology for how they think they learn best in school. Finding the balance between objective versus subjective dimensions of knowledge development (Kuhn, Cheney, & Weinstock, 2000) was presented in student responses. Also different education
activities mentioned by students in this sample could convey different levels of argumentative reasoning. For example, comments below represent student responses:

- “I learn best at school when I work with partners and I see how they do stuff and I combine it with my stuff to make new things.” (Grade 3, male)
- “Sometimes I try different strategies and other times I try and finish and that’s it. If it’s challenging do strategies but if it’s like one question I check it over and that’s it.” (Grade 5, male).

Though distinct activities (like debates or individual work) are not mentioned, students are nevertheless using reasoning strategies and interactions with other students to gain different perspectives; which could influence their knowledge and reasoning skills. Schommer’s (1990) intelligence dimensions can be studied through the qualitative analysis examining different ways of learning through the classroom. In respect to epistemic beliefs (Schommer, 1990) the sample of student responses are identified by two main epistemic beliefs - the source and ability to learn. In relation to intelligence dimensions, students vary across the continuum in the way they locate the source the knowledge and how they learn the knowledge. To isolate each of the beliefs and continuum for a middle childhood population, more research needs to be conducted. Because this study is a preliminary analysis, it has provided an introduction into student thinking and knowledge development, and how it can further affect teaching philosophies in the classroom.

Overall, it is inspiring that students were able to demonstrate awareness on how they learn best in the classroom. Responses conveyed student understanding of their classroom environment and flexible thinking about how they think they learn best in the classroom (Felix, 2005). This sample can provide an opportunity for educational staff and researchers to
understand student preferences in learning, in addition to how different theories of children’s learning represent students in the classroom. As described by Hofer (2001), the classroom allows students to exercise, construct, and re-construct knowledge within a supportive academic community. The classroom (Brownlee et. al., 2017; Olson & Bruner, 1996) along with peer and teacher relationships (Hofer, 2001), classroom procedures and management (Pickett & Fraser, 2010; Schoenfeld, 1988; Winitzky & Kauchak, 1995) as well as the continuous development of the classroom (Felix, 2005) are supported by student responses that encompass a humanistic perspective of child development. The results of this preliminary analysis indicate that future research is needed to understand the complexities of student learning in the classroom.

Chapter V

Conclusion

The classroom is a set of multiple complex relationships that influence students’ ability to learn (Zhang et al., 2011). Three focal areas of the classroom comprised students’ epistemological development (Chandler, Hallett, & Sokol, 2002; Kuhn, Cheney, & Weinstock, 2000; Schommer, 1990), the classroom environment (Brownlee, Curtis, Spooner-Lane, & Feucht, 2017; Pickett & Fraser, 2010), and the teacher influence and philosophies on student learning (Frye & Ziv, 2005; Olson & Bruner, 1996). Additionally, collecting student perspectives allows children to be active participants in their own educational experiences (Laws & Mann, 2004; Mitra & Serriere, 2012). This study was a preliminary analysis about how students aged 8 to 12 think they learn best in the classroom. Using thematic analysis (Braun & Clarke, 2006), the objective addressed student responses to learn about how individual relationships and classroom environments helped them learn best. Student
responses revealed multiple aspects of the classroom environment that both support or distract from their learning.

Findings from the analysis showed that students aged 8 to 12 were able to identify multiple relationships within the classroom and uncover new areas of learning. Aside from the three focal areas of the classroom (student epistemologies, classroom environment and teacher influence), other areas were identified such as classroom tools (particularly technology), classroom management influencing distraction to learning, and student readiness.

**Strengths**

This study had multiple strengths when examining students’ theories about how they learn during middle childhood. First, the data collection was completed as part of a larger study in which students were completing similar activities since kindergarten. This provided a good rapport between students and researchers as it became a yearly routine for students to have an opportunity to carry out learning activities as part of the ongoing research (DeMarie, 2010). This relationship-building allowed students to feel more comfortable opening up about how they learn and to mention concerns about their learning in the classroom (Nilsson et al., 2015). Second, the question “How do you learn best at school?” is open-ended, which allows a variety of answers to be collected and explored. Third, this study provided a qualitative analysis about students’ responses to how they think they learn in the classroom. It provided an analysis of a more in-depth perspective of classroom relationship themes that could not necessarily be captured within numerical count.

**Limitations**

One limitation to this study is the limited perspective of students when asking them how they learn best. From this group of students, it is clear that students reference multiple
aspects in the classroom and it would have been beneficial to capture teachers’ or even parents’ insight. This would have provided a holistic understanding of what and how key individuals can influence student perception of their own learning in the classroom. Due to only having the student perspective, there is no means to measure if students are accurately indicating how they learn best in the classroom (Boström, 2012). Another limitation is the inclusion of only one question to inquire how students learn best in the classroom. The intent of the interview was to build on previous years’ interviews about the long-term social and academic outcomes of full-day kindergarten. Since this study only examined student interviews and responses which came from a larger study (Pelletier, 2014; Pelletier & Corter, 2018), a preliminary analysis was done to show how students think they learn in the classroom.

**Implications**

This study has provided a qualitative understanding to how children think they learn best in the classroom. Analyses demonstrated the importance of multiple aspects of the classroom environment that help students learn best (Zhang et al., 2011). A variety of responses were provided which emphasized classroom tools that help students learn in the classroom. Teachers’ professional development and influence in the classroom can be further explored from student responses as they are mentioning a variety of teaching methods (Brownlee, Curtis, Spooner-Lane, & Feucht, 2017; Felix, 2005). This research is consistent with Townsend and colleagues’ (1999) description of the ‘third millennium’ learning environment as classroom culture, technology and ways of constructing knowledge continue to develop and impact the classroom. With attention to metacognitive teaching and skills (Pramling, 1988), students can become more aware of themselves and influences within the
learning environment as they identify the way they learn best within the classroom. This increasing self-awareness can provide students with the knowledge to self-advocate on what they need to reach their full academic potential.

**Future Directions**

At first, I believed that the only way I would be able to analyze how students learn in the classroom was to examine the question that simply asks students how they learn within the school environment. After reviewing other studies that examine children’s learning, as well as other forms of data collection with children, I have developed new ideas to further pursue this subject of student reflection of knowledge development in the classroom. A future research study could continue using semi structured interviews by having more questions to explore ‘how students perceive their learning’. Other collection methods such as drawings, photography, self-report and the draw, write and tell would be used (Brownlee, Curtis, Spooner-Lane, & Feucht, 2017). Using these measures and other academic measures intended for student perceptions, could provide further clarification and insights into students’ thinking and reasoning.

Future studies, consistent with past research (Boström, 2012; DeMarie, 2010; Peterson et al., 2011; Pramling, 1988; Zhang et al., 2011), could use key informants such as teachers, parents, and school administration to frame questions around knowledge location and learning strategies students reference in the classroom. Another future step would be to research students in older grades and in secondary school. This would allow the research on epistemological understanding and knowledge construction to expand and grow with students at various development phases. Also, potential research would examine specific epistemological theories, such as Schommer’s (1990) and Kuhn’s (1991) by using their
measures and child data collection methods to analyze student’s levels of intellectual dimensions and levels of argument reasoning. Using these different measures as well as data collection methods, would bring a holistic view of the student perception of their learning in the classroom. This can be completed by referencing past research (Brownlee, Curtis, Spooner-Lane, & Feucht, 2017; Kuhn, Cheney, & Weinstock, 2000; Schommer-Aikins, Duell, & Hutter, 2005) when working with students to understand how they reflect knowledge in the classroom setting. Additionally, another direction for future study would be to explore the benefit and presence of fidget gadgets or manipulatives in a classroom setting. As classroom culture develops in future years (Townsend, Clarke & Ainscow, 1999) to further accommodate fidget gadgets, such a study may become more relevant. It would be useful to explore if allowing students to have this particular classroom tool helps students concentrate in both early to late academic years. Lastly, another area of interest would be investigation into the benefits of expanding the use of educational technology in a classroom environment.

As opposed to having specific technology applications for academic subjects for children with learning difficulties (Tang, Li, Hsin & Tsai, 2016) it would be fascinating to explore those technological advancements in everyday classrooms.

To engage and support students to reflect on their own thinking (epistemological understanding) and personal learning preferences would challenge their thinking on what happens in the classroom and how it affects them daily. Key aspects of the classroom include the environment and staff, which ensure that students receive all opportunities for knowledge constructing experiences. Students’ grade level may also contribute on how they believe they acquire knowledge through the classroom. Moreover, the way students learn within the classroom has become more flexible and adaptive because of the changing environment and
classroom tools that have been introduced to the modern-day classroom. The results of this thesis will contribute to the growing importance of how students report that they learn in the classroom.
References


