THE RELATIONSHIP BETWEEN GRADES FOUR TO SIX STUDENTS' PERCEPTIONS TOWARDS MONTESSORI TEACHING METHOD AND THEIR ACHIEVEMENT AT MAHACHAI CHRISTIAN WITTAYA SCHOOL, THAILAND

David Beaumartey

A Thesis Submitted in Partial Fulfillment of the Requirements for the Degree of MASTER OF EDUCATION in Curriculum and Instruction Graduate School of Education ASSUMPTION UNIVERSITY OF THAILAND 2015
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Thesis Advisor: DR. YAN YE

The primary purpose of this research study was to investigate students’ perceptions towards Montessori teaching method and whether there is any relationship between students’ perceptions towards Montessori teaching method and their academic achievement. The study was conducted upon grade 4, 5 and 6 students at Mahachai Christian Wittaya School, Mahachai, Thailand in a Montessori setting. A questionnaire was used for data collection and 97 students completed the surveys that measured their perceptions towards Montessori teaching method. The data analysis showed that the students’ perceptions were positive. A one-way ANOVA indicated that statistically no significant difference in the perceptions towards Montessori teaching method existed between the three groups. It was found that the students were most positive towards the construct of challenge and were not sure of their positions.
towards control and captivate, which had the lowest mean scores. Students’ GPAs were found to be very good. A Pearson Correlation conducted to investigate the relationship between students’ perceptions and their achievement found the existence of a strong positive relationship between students’ perceptions and their achievement levels and supports previous research. It is recommended that Mahachai Christian Wittaya School could use current data to plan future changes and improvements and consider students’ perceptions in future strategies. Future research should investigate the constructs of control and captivate to find out the effects of these variables upon student performance.

Field of Study: Curriculum and Instruction

Graduate School of Education

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Student’s signature..........................

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CHAPTER I
INTRODUCTION

This chapter includes background of the study, statement of the problem, research questions, research objectives, research hypothesis, theoretical framework, conceptual framework, scope of the study, definition of terms and significance of the study.

Background of the Study

Every new academic year, parents search to find the best school environment for their children. Their goal is to enroll their children in the school where they will learn and prepare for future careers. Parents trust the school and teachers to provide the most ideal curriculum for bringing out the best in their children. Sometimes the number of choices available makes it hard for the parents to decide which school to send their children to. Parents can choose according to school curriculum, school reputation and even on the basis of teaching method. Today, the availability of variety of school settings make the parents wonder, which learning environment is the most suitable for their children. The most prominent choices would be teacher centered teaching environment of the traditional education and the student centered teaching environment of the Montessori teaching method among others. Maria Montessori’s technique of education has gained popularity around the world and given an alternative to parents as far as choices for enrollment of their children are concerned. Many educators are of the view that Montessori teaching method produces excellent learners (Humphryes, 1998).

The first school was started in 1907 for the economically disadvantaged and mentally retarded children (Pickering, 1992). Maria Montessori developed the Montessori teaching method and referred to it as the scientific pedagogy. Montessori
teaching method has come a long way since Maria Montessori evolved her unique style of teaching children. It has changed the way students learn. The program continues to grow in popularity and thousands of students around the world are enrolled in different Montessori schools. It is to be noted that the word "Montessori" is not protected by any law and anyone can use it for any purpose. And so there are private Montessori associations and institutions around the world. It is difficult to provide any figure as to the actual number of Montessori schools around the world. According to Michael Olaf Montessori Company (2015), there are about 7000 Montessori schools around the world whereas Montessori Academy (n. d.), says that there are more than 25000 Montessori schools around the world.

Montessori education has spread all over the world. Today, a large number of Thai children are studying in various Montessori schools all over the country. Montessori education is slowly gaining popularity in Thailand with many schools starting Montessori programs.

Mahachai Christian Wittaya School started using Montessori teaching method of teaching since 2006. During the initial years parents had the option to choose between Montessori and traditional method of teaching. However, in a few years the school board decided to phase out the traditional method leaving the parents without any option. This study looked at the Montessori teaching method in finding the perceptions of students towards methods of teaching and seeks to find out whether they were related to student’s achievement.

Statement of the Problem

In spite of having a well-documented history, research on Montessori teaching method regarding the students’ perceptions and its relation to their achievement is
limited. Earlier studies focused on the academic achievement of Montessori students in a private school setting compared to those students in a more traditional school setting (Rathunde & Csikszentmihalyi, 2003).

While the Montessori teaching method uses a variety of methods to assess its efficacy, it does not include student feedback and its usefulness. Not including students’ opinions and recommendations, Montessori teaching method misses an opportunity to truly assess effectiveness and the means for improving their teaching styles.

This research was an attempt to find out students’ perceptions towards Montessori teaching method and how they are related to achievement and to help the administration to improve teaching methods. Mahachai Christian Wittaya School in Samut Sakhon, Thailand uses Montessori teaching method at the time of conducting the study.

**Research Questions**

The study sought to answer the following research questions.

1. What are grade 4, 5 and 6 students’ perceptions towards Montessori teaching method?

2. What is grade 4, 5 and 6 students’ achievement by the use of Montessori teaching method?

3. Is there any relationship between students’ perceptions towards Montessori teaching method and their achievement?

4. Are there any differences in the students’ perceptions among the different grades towards Montessori teaching method?
5. Are there any differences in students’ achievement among the different grades by the use of Montessori teaching method?

**Research Objectives**

1. To determine grade 4, 5 and 6 students’ perceptions towards Montessori teaching method.

2. To determine grade 4, 5 and 6 students’ achievement by the use of Montessori teaching method.

3. To determine the relationship between students’ perceptions towards Montessori teaching method and their achievement.

4. To compare students’ perceptions towards Montessori teaching method among the different grades.

5. To compare students’ achievement by the use of Montessori teaching method among the different grades.

**Research Hypotheses**

1. There is a significant relationship between students’ perceptions towards Montessori teaching method and their achievement.

2. There is a significant difference in students’ perceptions towards Montessori teaching method among the different grades.

3. There is a significant difference in students’ achievement by the use of Montessori teaching method among the different grades.
Theoretical Framework

This study was mainly based upon Maria Montessori's theory of education and the Tripod Project Student Assessment founded by Ferguson (Ferguson, 2008).

Montessori Teaching Method

Montessori teaching method is based on the principles of Maria Montessori. Montessori teaching method grew in popularity and emerged as an alternative to traditional schooling around the world. Maria Montessori believed that children had natural ability to learn (Lillard, 1972) and so the pedagogy of this method of teaching is grounded on the freedom of the student.

Maria Montessori’s theory of education is a unique approach to educating learners. It is a comprehensive educational approach from birth to adulthood based on the observation of children's needs developed by Maria Montessori. In The Absorbent Mind, Montessori (1949) stated that the most important period of life is not the age of university studies, but the first one, the period from birth to the age of six. She wrote that the early years is the time when man's intelligence is being formed. And along with his intelligence the full totality of his psychic powers are being developed. According to her at no other age has the child a greater need of an intelligent help. This is the time when any obstacle that impedes his creative work will lessen the chance he has of achieving perfection.

Montessori (1912) defined education as active help given to the normal expansion of the life of the child. Montessori education is a form of educational approach that focuses on developing a child as an independent learner. Montessori teaching method emphasizes independence of the child, freedom of the child within a prepared environment and the child's overall development. Montessori teaching
method is based upon scientific study of the child and a resulting understanding of the processes of development and learning. It keeps consistent records of the child’s development by what is termed as the ‘scientific observations’ based on level of concentration of the learner, mastery of the materials, social and physical developments and other areas. Montessori identified sensitive periods in a child’s life and observed that this period involves fast acquisition of abilities such as discrimination of sensory stimuli, language and mental absorption of the environment. Montessori’s educational system aims at making best use of this period and mitigating hindrances that may keep the child from developing and tapping into his highest level of growth. Montessori education is characterized by mixed age group classrooms, prepared environment for facilitating maximum independent learning, learner centered approach to teaching and freedom of choice as regards to movement and choice of learning activity from a recommended choice.

According to Montessori (1912), the child, not the teacher, is the construction of man, and so of society and thus human teacher can only help the great work that is being done. Maria Montessori (1946, as cited in Lillard, 1972) stated that in a Montessori teaching method, ‘Education’ is not what the teacher gives; but it is a natural process spontaneously carried out by the human individual, and is acquired not by listening to words, but by experiences upon the environment. As Seldin and Epstein (1996) wrote, according to this method of teaching education is effective when children are placed in a prepared natural environment and are given the freedom to explore their environment through prepared materials and activities relevant to learning. Therefore, in a Montessori school the teacher’s job is to provide the materials and environment that will aid development and be ready to respond when
help is needed. Montessori teaching method also uses specialized materials to facilitate effective learning.

The Tripod 7Cs Model for Student Perceptions

Looking at the different facets of Montessori teaching method one may relate to the 7Cs of the primary measures of instructional quality laid down by the Tripod project survey. The Tripod 7Cs Model was originally developed by Ferguson (Harvard Researcher), and has since been refined under the Measure of Effective Teaching (MET) Project funded and supported by Bill & Melinda Gates Foundation (Ferguson & Danielson, 2014). The project framework for measuring teaching practices consists of seven constructs which includes care, control, clarify, challenge, captivate, confer, and consolidate (Hanover Research, 2013). The model captures key properties of students’ classroom life and learning practice as they experience them. The Tripod 7Cs model survey measures student perceptions in the areas of teaching effectiveness, student engagement, student satisfaction, and whole-school climate.

Conceptual Framework

The study aimed at investigating the relationship between students’ perceptions towards Montessori teaching method and their achievement levels. In the study, students’ perceptions towards Montessori teaching method were measured by seven constructs, which are Care, Control, Clarify, Challenge, Captivate, Confer, and Consolidate. The researcher chose to use the questionnaire as descriptors for students’ perceptions on Montessori teaching method. Figure 1 shows the conceptual framework for this study.
Students' Perceptions towards Montessori teaching method:
- Care
- Control
- Clarify
- Challenge
- Captivate
- Confer
- Consolidate

Students' Achievement
- GPA

Students' Grades:
- Grade 4
- Grade 5
- Grade 6

Figure 1: Conceptual Framework

Scope of the Study

This study was limited to one school situated at Samut Sakhon province in Thailand and may not be generalized to other educational settings.

The school has students from kindergarten to grade 6. The study was only based upon grade 4, 5 and 6 students of the school as they were mature enough to express their thoughts and give proper feedback on the questionnaires. The rest of the grades were not included in the research as they are very young and intellectually incapable of expressing their views. All the students of grades 4, 5 and 6 were included in this study. The study was conducted in the academic year 2014. For the purpose of this study the Tripod 7Cs model student perceptions questionnaire was used and measured the perceptions towards Montessori teaching method in the areas
of care, control, clarify, challenge, captivate, confer, and consolidate (Hanover Research, 2013).

**Definitions of Terms**

**Achievement:** refers to the level to which a student has achieved his or her educational goals. Achievement in this study is measured by the grade point average (GPA). Grade point average (GPA) here means the grade point average from Mahachai Christian Wittaya School.

**Grade:** refers to the level at which the students are studying. Thus, here it would mean the primary school levels 4, 5, and 6.

**Mahachai Christian Wittaya School:** It is the Mahachai Christian Wittaya School located at Samut Sakhon province in Thailand.

**Perceptions Towards Montessori Teaching Method:** Montessori teaching method is the practice of hands-on, self-paced instruction developed by Maria Montessori. It is student centered learning allowing freedom of movement and freedom of learning using specially developed materials. For the purpose of this study perceptions would mean attitudes, points of view, opinions, judgments, appraisal and perspectives of students towards Montessori teaching method. The following seven psychological constructs together make up the perceptions towards Montessori teaching method.

- **Care:** Care is the teacher’s behavior towards the students to make them feel safe and secure. Proper care makes the students feel emotionally safe and consider the teacher as trustworthy guide and leader. Caring stimulates positive feelings of belongingness. Caring tells the students that the teacher understands them and is working for their best interest. Care goes
beyond lecturing in the class to help them with their problems and issues. Items 1-7 measure the care construct of the students’ perceptions.

- **Control**: Control is concerned with the teachers’ role in classroom management and discipline. Proper control creates an atmosphere of learning and helps the students to focus. Effective control will keep the students engaged in learning activities. This part is measured by items 8-11.

- **Clarify**: Clarify in this study is related to how the teacher explains the different lessons and how she/he interacts with the students. Different students have different learning styles. To be effective, a teacher must understand and be able to diagnose the learning styles of the students. An effective teacher should be able to use multiple ways of teaching and explaining in order to help all students to understand different concepts. Clarify is concerned with getting rid of the doubts and confusions that students may have after a particular lesson. Items 12-19 measures the clarify construct of the questionnaire.

- **Challenge**: In this study, challenge concerns both endeavor and strictness. Challenge involves pressing the students to give their best both physically and mentally. Students who are weak in processing things are pushed to face the problems. This construct is measured by items 20-23.

- **Captivate**: Captivate is concerned with how a teacher is able to arouse the interest of the students in the lessons taught in the class. Teachers who are good in this area will make the lesson interesting and stimulating. The students will not be bored but will be actively involved. Items 24-27 measure this construct.
• **Confer:** Confer concerns asking questions and inviting the students to answer them. A teacher with good conferring skills involves the students in the lesson and affirms that their ideas and responses are important. A conferring teacher encourages students to share their points of view in the class and with other students. He or She encourages positive discussions. This part is measured by items 28-34.

• **Consolidate:** In this study consolidate concerns with how a teacher assures that the students understand the lessons taught and can organize the materials for efficient reasoning. It may include reviewing and summarizing the lesson to enhance retention. Items 35 and 36 measure this construct.

**Students:** Students for the purpose of this study means all grade 4, 5 and 6 students at Mahachai Christian Wittaya School, Thailand in the academic year 2014.

**Significance of the Study**

The significance of the study was shown as follows:

**For Teachers:** The study will help educators in learning about the students’ own view of the teaching methods at the school. Students’ view or perceptions will help in reviewing the teaching methods and techniques. The students’ perceptions and opinions will help in modifying and improving teaching techniques to suit their interests. Students’ attention and interests are important for any learning. Thus, the study will help in proper planning and improved techniques of teaching.

**For Administrators:** The study will also provide vital and current data to educators, administrators, the school board and researchers regarding the most desired
instructional methods. The school administration will know what is to be changed and how to plan for future improvements.

**For Researchers:** The Montessori teaching method, in spite of being very popular and accepted by parents lacks any research focused on students’ perceptions towards it and their relationship to the students’ achievement levels. Thus, this study attempts to find the relationship between Montessori students’ perceptions and their achievement level. It gives a ground for future researchers to develop on the topic and expand the study on a national or even international level involving more Montessori institutions.
CHAPTER II

REVIEW OF RELATED LITERATURE

The purpose of the current study was to examine the perceptions of students towards Montessori teaching method. This chapter includes: Historical Contexts of Montessori Education, Montessori Teaching Method, Montessori and Other Theorists, Normalization in Montessori Teaching Method, The Tripod 7Cs Model, Students’ Perceptions, Students’ Achievement, Pervious Studies on Students’ Perceptions and Achievement, Montessori Teaching Method in Thailand, Background of the School, A Brief Introduction to Montessori Teaching Method in Mahachai Christian Wittaya School, and a Summary of Reviewed Literature.

Historical Context of Montessori Education

Education has come a long way through generations. Knowledge has been passed down in various ways such as demonstration, replication, stories, songs and others. The formal way of schooling as we see it today has passed through various stages of refinement and development. The traditional method of teaching has been the most prominent and prevalent method of teaching throughout the world and oral recitation has been the fundamental style of teaching in traditional method (Beck, 2009). Down through generations different reformers such as John Dewey and Anton Makarenko have tried to reform society by reforming education (Goodman, 2013). The reforms in various forms and directions have brought about changes in the way teachers teach and the learners learn. Teachers and educators have tried to come out with improved and effective techniques of teaching styles. Maria Montessori was one such educator who not only attempted but also successfully developed her own unique way of teaching children. The Montessori teaching method was the result of Maria
Montessori's research (Lillard, 2007). She was the first woman to graduate from a medical school in Italy in 1896. After her graduation in medicine, she was employed in the hospital attached to the University. She also took up courses in pedagogy and later, became the director of the Orthophrenic School for developmentally disabled children and began to research early childhood development and education.

Montessori began to develop her own ideas about education and started experimenting using her own methods and observing students at the Orthophrenic School. Montessori observed improvements in the students and desired to use the methods on normal children. She got her chance with the children from the slums and set up her first school called Casa dei Bambini (The Children’s House). Her method was very successful and soon more schools were established. In 1929, Maria Montessori and her son Mario founded the Association Montessori Internationale or AMI to oversee the activities of Montessori schools around the world.

**Montessori Teaching Method**

Montessori developed a method or an approach of education for tapping the children’s full potential. She is one of the proponents of constructivism and held that learners construct knowledge out of their experiences. Montessori jumped on the bandwagon of constructivist theorists and suggested that teachers are to be facilitators and not dictators. As Lillard (2007) writes, students’ innate desire to learn forms the basis for structural framework of Montessori teaching. Montessori teaching method emphasizes on the development of what is called the ‘whole child’ - the emotional, social and intellectual aspect of a child.

Montessori teaching method is an educational program that aims to develop the child into a learner with self-esteem and self-confidence to be able to succeed in
life (Duffy, 2008). The Montessori approach to education emphasizes learning according to the child’s own speed. It stresses respect for the child, freedom of movement and choice of learning activities and encourages the importance of self-education. The Montessori teaching method seeks to prepare children as lifelong independent learners. In a Montessori school, the Children learn concepts from working with materials rather than by direct instruction. Montessori (1949) stated that it is useless to preach to children but to respect their intelligent activities and leave them alone. According to her, preaching to them would be like talking to the wind. She went on to say that it is of futile to put examples in front of these children because they may do better than the examples.

In Montessori teaching method, the teachers follow the students instead of forcing them to obey what the teacher asks. Montessori approach supposes that children are able to develop skills and abilities when given choices. Montessori approach believes that a child’s mind has absorbent qualities and that a child absorbs knowledge directly into his psychic life. For example, a child learns to speak his native language simply by being himself (Montessori, 1949). Montessori classes are also of mixed age groups but they work together in the same class. Age-groupings are based on the 3-year bands e.g. 0-3 years, 3-6 years, 6-9 years, 9-12 years, or 12-15 years. According to Pragnya (2010) the older children gets the opportunity to become role models for the younger children and at the same time consolidate what they have learned themselves. On the other hand, the younger children also learn from observing and working with the older children. Other benefits of mixed age classrooms include learning social skills, sense of belonging to a community and self-confidence among the learners.
Another important feature of Montessori teaching method is the prepared environment. Based on the belief that children learn best in a prepared environment, Montessori schools emphasize on preparing a comfortable environment for the children to do things on their own. The prepared environment is different for each level of learning, but uses the same principles. The environment is designed to further independent learning and exploration by the child. Freedom of movement is an important characteristic in a prepared environment. It enables the children to explore materials on their own and absorb what they find there. In a Montessori system of education the child is an active participant in learning whereas the teacher is just an instructional facilitator and guide. Absorbent Minds Montessori (n.d.) states that in Montessori teaching method independent activity constitutes about 80% of the work while teacher-directed activity accounts for the remaining 20%.

The prepared environment consists of different materials, which include materials for practical life skills, materials for sensorial exercises and materials for academic endeavors. The practical life exercise materials are directed towards developing a child’s basic living skills. These skills may be as simple as holding a book properly or pouring water into glass. The child is taught to focus mental attention while working to control his own movements. The exercises may include activities such as keeping balance, walking exercises, working with materials in a gentle way and so on. The sensorial materials are used for developing and refining the five senses, in that they enable children to explore specific attributes of their world using their senses. They focus on each quality that can be perceived by the senses. They consists of various shapes and sizes focusing on different sensorial perceptions such as height, weight, big, small, loud, sweet, salty, and such others which have a direct bearing on the senses. The materials have built-in control of error allowing the
child to check whether he has done the exercise correctly. Examples of these materials are the broad stair designed to teach the concept of thick and thin and the colored cylinders for teaching different colors and the concept of width and height. The last kind consists of materials aimed at developing the children’s academic learning. These are materials relating to different subjects such as math, science (Geography, Zoology, Botany) and language. For example, the golden beads are used for teaching numbering and there are various geometric shapes such as equilateral triangles, circles, and squares for teaching geometry.

Montessori and Other Theorists

Early childhood education has been influenced by a number of early childhood theorists, the most prominent of them would be theorists such as Friedrich Froebel, John Dewey, Maria Montessori, Jean Piaget, Erik Erikson and Vygotsky. Froebel was the first to use the word ‘kindergarten’. He developed the idea and included play as an important part of early childhood education. Long before Montessori, Froebel created materials for children’s education and called them “gifts” (Kuschner 1981). Though their theories have similarities they are also different in many ways. Froebel’s theory laid emphasis on both physical play and imaginary play whereas Montessori’s theory did not include imaginary play. According to Montessori, children’s imagination should lead to intellectual development. In a Montessori class the students are encouraged to work individually with materials created for intellectual development while classrooms using Froebel method focus on group work (Lawlor, 2013). John Dewey is another philosopher and reformer whose ideas influenced educational endeavors. Dewey maintained the importance of experience in a child’s educational development and believed that a child’s mind grows as they involve in social
activities (Pancare, 2015). Unlike Maria Montessori Dewey believed that humans are not born with innate animated spirit and that society shapes a child. Thus, for Dewey education is not natural and spontaneous but reconstruction of experience (Kierstead, 1981). Jean Piaget was a constructivist whose ideas had a lot in common with Montessori. Like Montessori, Piaget believed that children construct their own knowledge and develop in sequence. Piaget laid down four stages of cognitive development which include sensorimotor (birth to about age 2), preoperational (begins about the time the child starts to talk to about age 7), concrete operational (about first grade to early adolescence), and formal operational (adolescence through adulthood) (Gottesman, n.d.). Both Montessori and Piaget proposed that children develop in sequence but disagreed on timing. According to Piaget children had specific periods of "cognitive" or intellectual development, and reached their "concrete operational" only after seven years of age. Montessori proposed that children had "sensitive periods", meaning that they developed certain skills at a particular age and emphasized that development of all the senses should occur at an early age (Montessori Answers, n.d.). They both valued sensory-motor training in children’s cognitive development. Piaget’s idea of the relationship between the learner and the environment is highly compatible to Montessori’s ideas. Both Piaget and Montessori believed that children develop through interaction with the environment and that the environment provides the necessary ingredients for intellectual growth (Castellanos, 2002).

Erik Erikson is another early childhood theorist whose ideas have impacted early childhood education. Erikson proposed eight stages of development that humans encountered throughout their life and believed that a person’s personality would be outcome of the influence of the previous stages. Erikson emphasized the importance
of the adolescent period in developing a person’s identity. The different stages of development according to Erikson are Infancy (0-18 months), Early Childhood (18 months – 3 years of age), Play Age (3-5), School Age (5-12), Adolescence (12-18), Young Adult (18-40), Adult hood (40-65) and Maturity (65+) (Mcleod, 2013).

Vygotsky’s ideas on cognitive development were similar to Montessori and Piaget in that he believed that children are interested and actively involved as far as learning is concerned. They are active participants in the discovery and development of new knowledge (Mcleod, 2014). However, Vygotsky considered social interaction as the most significant factor in the process of development, whereas Montessori saw development as innate and natural unfolding itself in preprogrammed stages. Montessori believed that development in children took place through natural internal capacities boosted through prepared environment. Vygotsky did not give as much importance to prepared environment as social interaction. Again, Vygotsky believed that play was a very significant stimulus for learning, whereas Montessori did not consider play as a catalyst to learning (Bodrova, 2003).

Normalization in Montessori Teaching Method

Maria Montessori talked about normalization as the single most important result of her work. The aim of Montessori education is to develop normalized children. The term normalization refers to the process of growing inner discipline and peace in children. Normalization is an anthropological word, which means to become a contributing member of society (Shaefer Zener, 2006).

It is the ability of the children to focus, concentrate and be independent and means that they are able to initiate work and follow rules by their own choice. Maria Montessori (1949) stated that there are four characteristics that show that
normalization is happening:

1. Love of work

2. Concentration

3. Self-discipline

4. Sociability.

**Love of work:** The first characteristic of the process of normalization is love of work. The children should be able to choose the work and enjoy working with it.

**Concentration:** Concentration is another characteristic of the process of normalization. As children involve in learning activities they learn to focus and concentrate.

**Self-discipline:** The next stage of development after concentration will be self-discipline. Self-discipline is the ability to carry through what the child has begun. The children should be able to successfully finish the work he has started.

**Sociability:** The last characteristic in the process of normalization is sociability. Sociability refers to the child’s ability to respect others’ work. It is about being able to live in harmony and peace with others and the environment. Sociability involves patience; he will wait for the materials he wants to use if being used by another student. It refers to harmonious working relationships among members of the group.
The Tripod 7Cs Model for Student Perceptions

Ferguson developed the Tripod 7Cs model with other educators in Shaker Heights, Ohio. The basic idea behind the Tripod model is content, pedagogy and relationships where content implies knowledge of the teachers, pedagogy implies pedagogical knowledge and skills to help and teach students and relationships refer to the relationship skills needed to connect to the students and build a healthy relationship of mutual trust and understanding. All the three areas affect the teachers’ responsibilities and abilities in engaging the students in active learning to reach the desired level of achievement. Thus, academic achievement of a student depends on building up the three areas of the instructional tripod.

The central focus of the model is on achieving the five student engagement targets, namely 1) feel trusting/safe/welcome at school, 2) balance control/autonomy, 3) set high goals, 4) work diligently/industriously and 5) achieve satisfaction/success/celebrate (Ferguson, 2008). According to this model, seven multi-item indicators capture student engagement and achievement. These are the seven teaching effectiveness measures or the 7Cs. The 7C’s of effective teaching are:

1. Caring: Caring involves nurturing productive relationships. It is concerned with how a teacher develops a caring relationship with the students and is able to understand their feelings. It is focused on giving emotional support to the student and how the teacher makes the student feel safe. Proper care signals positive feelings about the teachers’ intentions.

2. Control: Control is concerned with how well the teacher manages the classroom atmosphere. The classroom should not just be in order but the students should be engaged in learning activities. Proper control ensures that
teaching and learning is not disturbed by misbehaviors of the students.

3. Clarify: Clarify here means how well the teacher is able to explain the lesson. It involves the teaching and learning activities that help students to clear doubts and confusions. The teachers should know the learning styles of the students and be able to use multiple ways of teaching a lesson. The teacher is able to explain concepts clearly and has patience to persist until the students attain the required level of understanding.

4. Challenge: Challenge involves making the students give their full effort and not give up in the face of difficulties. The teacher makes the lesson in such a way as to requiring the students to exercise their intellectual abilities. If anyone is found not giving enough effort in his or her studies the teacher pushes the student to do better and give more effort.

5. Captivate: Captivate is concerned with how well a teacher is able to stimulate interest in the lesson. A boring lesson is not able to gain the interest of the students and so they will not learn much in the class. On the other hand, if the lesson is well prepared and the materials and activities are made interesting the students will easily learn the lesson. A captivating lesson attracts the attention of the students and engages them in learning activities.

6. Confer: Confer implies that the teacher encourages the students to ask questions and share their ideas. The students are asked to answer questions by the teacher and at times discuss lessons among themselves. As the students expect questions from the teacher they pay attention in the class and discussion among students nurtures a thriving learning community.
7. Consolidate: Consolidate is concerned with helping the students to organize learning for effective reasoning and retention. Activities such as reviewing, summarizing learning at end of the class help the students in organizing materials and effective encoding (Ramsdell, n.d.).

The researcher chose to use the 7Cs model for measuring student perceptions as the seven constructs of the model focus on areas that are in some ways the distinguished features of Montessori teaching method. For instance, control is unique in a Montessori teaching method. Montessori teaching method advocates freedom of choice for the learners. The students are free to choose their own learning activities (Montessori, 1949). The 7Cs model thus directly measures student perceptions towards this characteristic of the Montessori teaching method. The items for measuring student perceptions in the 7Cs model such as “our class stays busy and does not waste time”, “everybody knows what they should be doing in class” and such others measure the unique features of Montessori teaching method. Montessori teaching method strives to prepare the learners as independent learners. Item such as “Everybody knows what they should be doing and learning in this class” is relevant in measuring the independence of the children. Similarly, other items in the perceptions questionnaire are in line with the goal and focus of Montessori teaching method.

Students’ Perceptions

As defined in the definition of terms, perceptions here would mean attitudes, point of view, opinions, judgments, appraisal and perspectives of students. Besides other stakeholders, the perceptions of students are significant for any educational institution. Researchers of social cognition propose that children are active interpreters of classroom reality and that they are continuously drawing inferences.
Thus, in recent times there has been increased interest in studies related to the student perceptions of classroom environment. Reviews in the area of students’ perceptions of learning environments are now available (Harris, 1990).

It is important to understand what students believe about the teaching method. What kind of teaching methods do students value most? Which methods do they value the least? Teachers and students need to come together and work in cooperation in order to achieve the best for the students. They need to have mutually understanding relationship for mutual benefits. The perceptions of students are important for a proper relationship. Perceptions towards a teaching method depend upon various factors such as how interesting a particular teaching method is. If the students enjoy learning in a student centered learning environment he or she would definitely have a more positive perceptions of the Montessori teaching method that is student centered. On the other hand if a student likes to work alone and likes a teacher centered learning environment then the student would surely have a more positive perceptions of the traditional method of teaching.

**Students’ Achievement**

Academic achievement can be defined as the level of achievement attained by a student. Every student’s goal and purpose is to succeed and achieve their educational goals. Achievement is usually measured by the student’s performance in various assessments conducted by the teacher or the school. However, it is seen that the level of achievement of all students are not the same. Achievement differs from student to student and from one school to another. Again, there are students who have sufficient mental abilities but are unable to perform well in assignments and tests. Researchers and psychologists have come up with various factors affecting student
performance and achievement which include: 1) cognitive and metacognitive factors, 2) motivation factors, 3) institution factors such as classroom climate, 4) emotion factors such as sense of school belongingness, 5) school climate and students’ perceptions, 6) family factors and 7) non cognitive factors such as personality trait.

Hattie (2009) recognizes six main contributors influencing achievement, namely the child (student), the home, the school, the curricula, the teacher and the approaches to teaching. He further analyzes these six areas and identifies 138 variables influencing student achievement. He then places the results under different effect sizes. When talking about the child, he indicates that the child brings along the following attributes that influence performance:

- Prior knowledge of learning,
- Degree of openness to experiences,
- Expectations,
- Beliefs about the value and worth form investing in learning,
- Ability to build a sense of self from learning,
- Engagement.

Variables such as self reported grades, self-concept and motivation come under child contribution. Influences from home include socioeconomic status, home environment, parental involvement in learning, parental expectations and aspirations and parental knowledge of the language of schooling. The school definitely influences performance and variables such as classroom climate, welcoming errors, safe and caring environment and peer influences have a bearing on the performance of a student. Under the teachers’ contributions he mentions variables such as teacher openness, classroom climate, teacher clarity in articulation, engagement of students and assessments. According to Hattie, curriculum is another factor influencing student
performance. The planned strategies, activities, skills in the curriculum play a role in a student’s achievement level. Teaching approach is another factor that influences learning. Student performance is also affected by the degree of challenge, the purpose and goal of the teaching that are all part of a teaching approach.

According to Jaggia and Kelly-Hawke (1999), variations in family background and in the backgrounds of other students in the school are the primary determinants of students’ performance. Wong (n. d.) states that the only factor that can create student achievement is a knowledgeable and skillful teacher. According to a report by Public Policy Institute of California (2003), teacher qualification and years of experience, and subject authorization do not have a systematic effect on student achievement. This report also stated that a student made improvements in academic life in the year in which high scoring peers surrounded him or her. Achievement motivation is another variable that has generally been accepted to influence student achievement. It is regarded as the drive to achieve goals and was originally postulated by J.W. Atkinson and his associates (Revelle & Michaels, 1976).

**Previous work on Students’ Perceptions and Achievement**

Educational theory of school learning and psychological theory of reasoned action proposed that student attitudes would causally relate to their achievement in the relevant subject (Bloom, 1976; Fishbein & Ajzen, 1975). If it is true that positive student attitudes or perceptions have a positive effect on achievement, it would be possible to improve student achievement through effective instructional strategies and student centered learning environments. However, meta-analyses of research on the relationship between perceptions and achievement show that the strength of the relationship between perceptions and achievement may vary by age, gender, related
subjects, culture, and the types of measures used (Weinburgh, 1995). Since any education is directed towards increasing the students’ achievement, the idea that change in perceptions may cause change in student achievement is important to investigate.

A study by Anderman and Midgley (1997), found that positive relationship existed between educational environmental perceptions and academic achievement. Other studies such as that of Gutman (2006), and Ryan and Patrick (2001) found positive effect of students’ perceptions of the classroom environment on their motivation levels and academic achievement. In another research, Vandiver (2005) found correlation between student perceptions of school climate and positive student outcomes. Fraser’s (1986) study on the climate of the classroom and its relationship to student learning found that perceptions of the classroom environment influenced student learning and achievement. Wang and Holcombe (2010), found that students’ perceptions of school environment influence academic achievement through their impact on behavior, emotion and cognition. The findings of another study showed a significant relationship between perceptions of the class environment and students’ academic achievement (Baek & Choi, 2002).

Azuka (2012) observed that empirical research have found relationships between student perceptions of others, learning environments and variations in their achievement aspirations and orientations. A study by Coats, Swierenga and Wickert (1972) on different environmental variables that include teacher competence, facility, teacher control, fairness and attitude towards students showed that student-teacher relationships and students’ perceptions of their teachers have influence upon the students’ academic and social achievement. It is interesting to note that a study conducted on the relationship between student achievement and student perceptions of
school climate found no significant relationship between students’ perceptions of school climate and student achievement. The researcher concluded that students’ perception of school’s climate is not a factor in student achievement measured in terms of GPA (Outhier, 1978).

Montessori Teaching Method in Thailand

Montessori education has spread all over the world. Today, a large number of Thai children are studying in various Montessori schools all over the country. Thailand has seen significant educational reform since the enactment of the Reform Act of 1999.

According to Montessori Association of Thailand (n.d.a), in the year 2000 the problems affecting children’s education were studied and Montessori education was offered as a solution. Montessori teaching method was thus introduced as a pilot project in 7 small government schools in 2004. The following year, some Thai government officials and private educators attended the 25th International Montessori Congress in Sydney, Australia. This was followed by a visit from Association Montessori Internationale president, Andre Robertfroid to Thailand (Montessori Association of Thailand, n.d.b).

The Montessori Association of Thailand (MAT) was established in 2006 in partnership with Association Montessori Internationale (AMI) and since then has conducted various training programs and seminars for furthering Montessori education in Thailand. By 2008 the government of Thailand approved and formalized cooperation. Montessori Association of Thailand (n.d.b) states that the first National Montessori Conference, ‘Nurture the Child and Advance the Nation’ was held in 2010 with the then HRH Princess Srirasmi Royal Consort of HRH Crown Prince of
Thailand and their son HRH Prince Dipangkorn Rasmijot officially opening the conference and acknowledging all those who had contributed to the establishment of Montessori in Thailand. Montessori teaching method is slowly gaining popularity in Thailand with many schools starting Montessori programs. According to Montessori Association of Thailand there are about 260 Montessori schools in Thailand and the number is growing fast (Montessori Association of Thailand, personal communication, March 15, 2015). There are also many international schools that are following the Montessori curriculum for their early schooling programs. During his research this researcher came across at least 10 international schools using Montessori curriculum in Thailand.

**Background of the School**

Mahachai Christian Wittaya School is private Christian school established under the Foundation of the Church of Christ in Thailand. It was founded on May 17, 1970 and runs classes from Kindergarten through grade 6. At present 40 teachers and about 500 children are enrolled in the school. The school is located at Mahachai in Samutprakarn province of Thailand. Since the starting of the school in 1970 it has been employing the traditional method of education. In 2006 the school initiated Montessori teaching method alongside the traditional education. The school has now decided to phase out the traditional method of teaching and use Montessori teaching method for the whole school.

The school has developed continuously and gained a good reputation in Mahachai. Since its foundation the school emphasizes morality, academics, discipline and responsibility. The current course curriculum based on Montessori teaching method focuses on empowering students to make positive changes within the school and the wider community.
A Brief Introduction to the Montessori Teaching Method
in Mahachai Christian Wittaya School

In the initial stage Mahachai Christian Wittaya School started out with the traditional method of teaching- using the teacher centered learning style. And in 2006 the school initiated Montessori teaching method in Kindergartens 1-3. The school board eventually decided to phase out the traditional method of teaching and adopt Montessori teaching method as the only method for the entire school and for all the subjects taught.

The Montessori teaching method used in Mahachai Christian Wittaya School is the same standard as the one developed by Maria Montessori. The school uses Montessori designed materials in all the Montessori classrooms. The school has also provided training on Montessori teaching method to all the teachers teaching Montessori classes.

The Montessori teaching method at the school complies with all the Montessori principles developed by Maria Montessori such as prepared environment, freedom for learners; self paced learning, respect for the child and others.

Summary of Reviewed Literature

This chapter looked at the review of the literature related to the study highlighting the history of Montessori teaching method and the origin of the Tripod 7Cs model and different aspects of perceptions and achievement. While discussing about the student perceptions, their importance have been explored and emphasized. Earlier research on student achievement show that there are different variables affecting student achievement. Factors such as classroom environment, family
backgrounds, peer groups, motivation have influence upon students’ performances. Earlier studies on perceptions and achievement have also found that there are relationships between student perceptions and their achievement.
CHAPTER III

RESEARCH METHODOLOGY

The purpose of this study was to determine the perceptions of students towards Montessori teaching method and investigate whether it is related to student achievement. Mahachai Christian Wittaya School uses Montessori teaching method up to grade 6. This chapter discusses the methodology used in the research and includes information regarding the population, instruments, and the statistical tests that are used.

Research Design

This study employed a quantitative-comparative design to investigate several areas of Montessori school experience from the viewpoint of students to serve the purpose of the study. The study was designed to find out the perceptions of students towards Montessori teaching method at Mahachai Christian Wittaya School.

A questionnaire was used to determine the students’ perceptions towards Montessori teaching method. The questionnaire was adopted from the Tripod Project Student Assessment developed by Ferguson (Ferguson, 2008). The study measured the students’ perceptions in seven areas, which are care, control, clarify, challenge, captivate, confer, and consolidate. One-way analysis of variance (ANOVA) was used to compare the perceptions of the different grade levels. The relationship between students’ perceptions towards Montessori teaching method and their achievement (in this study the GPA) was examined by using the Pearson Correlation procedure. Pearson correlation coefficient is the most common measure of determining the relationship between two sets of data. When applied to any sample it is denoted by the letter \( r \) and known as sample Pearson correlation coefficient.
Population

The school is a private school located at Mahachai in Samut Sakhon. The studying target groups are all the students from grade 4, 5 and 6 in the school. These students have been selected for the study as they have attained maturity to be able to independently express their views and give feedbacks.

Sample

There were total 99 students, who were studying at Mahachai School in the academic year 2014, used as the sample for this study. Table 1 shows the sampling details.

Table 1

The Number of Students for this Study

<table>
<thead>
<tr>
<th>Grades</th>
<th>Number of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade 4</td>
<td>42</td>
</tr>
<tr>
<td>Grade 5</td>
<td>37</td>
</tr>
<tr>
<td>Grade 6</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td>99</td>
</tr>
</tbody>
</table>

Research Instrument

1. Questionnaire for survey students’ perceptions

In this study, a questionnaire was used as the primary data collection instrument. The questionnaire is a validated survey instrument developed by Ferguson (2008).
This survey questionnaire consisted of 36 items that measure the different constructs of perceptions, which include care, control, clarify, challenge, captivate, confer, and consolidate. The questionnaire included seven items that measure students’ perceptions towards teachers’ care, four items that measured the construct of control, eight items that measured the construct of clarify, four items that measured the construct of captivate, seven items that measured confer and two items that measured consolidate. Table 2 shows the breakdown of the items in the questionnaire.

Table 2

*Breakdown of the Survey Instrument*

<table>
<thead>
<tr>
<th>No.</th>
<th>Constructs</th>
<th>Item Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Care</td>
<td>1-7</td>
</tr>
<tr>
<td>2</td>
<td>Control</td>
<td>8-11</td>
</tr>
<tr>
<td>3</td>
<td>Clarify</td>
<td>12-19</td>
</tr>
<tr>
<td>4</td>
<td>Challenge</td>
<td>20-23</td>
</tr>
<tr>
<td>5</td>
<td>Captivate</td>
<td>24-27</td>
</tr>
<tr>
<td>6</td>
<td>Confer</td>
<td>28-34</td>
</tr>
<tr>
<td>7</td>
<td>Consolidate</td>
<td>35-36</td>
</tr>
</tbody>
</table>

Students were required to respond to each statement using a five-point scale
with a “1” being strongly disagree, “2” disagree, “3” neutral, “4” agree and a “5” being strongly agree. A response score of “5” means perception is very positive with the range of core mean being between 4.51-5.00. Similarly, a response score of “1” means that perception is very negative with the core mean being in the range of 1.00-1.50. Table 3 below shows the details about the scale and interpretation of the student perceptions.

Table 3

*Interpretation and Scale of Students’ Perceptions*

<table>
<thead>
<tr>
<th>Agreement Level</th>
<th>Score</th>
<th>Scale</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>5</td>
<td>4.51 – 5.00</td>
<td>Very Positive</td>
</tr>
<tr>
<td>Agree</td>
<td>4</td>
<td>3.51 – 4.50</td>
<td>Positive</td>
</tr>
<tr>
<td>Neither Agree nor Disagree</td>
<td>3</td>
<td>2.51 – 3.50</td>
<td>Neutral</td>
</tr>
<tr>
<td>Disagree</td>
<td>2</td>
<td>1.51 – 2.50</td>
<td>Negative</td>
</tr>
<tr>
<td>Strongly Disagree</td>
<td>1</td>
<td>1.00 – 1.50</td>
<td>Very Negative</td>
</tr>
</tbody>
</table>

2. Measurement of Student Achievement

The achievement level was measured by the students’ grade point averages (GPAs), which were retrieved from the school records. Mahachai Christian School prepares grade point averages for reporting to parents and others interested in students’ development. Grade Point Averages (GPA’s) for the academic year 2014 were collected and examined by the researcher and used for academic achievement in the study. The school divides the grades into eight categories between ‘0’ and ‘4’
where a GPA between 1.1 to 1.5 would show the performance as ‘low’ and GPA of 3.6 to 4 would be the highest performance and shown as ‘excellent’.

Table 4 below shows the details about interpretation of the students’ achievement levels.

Table 4

*Interpretations of Students’ Achievement*

<table>
<thead>
<tr>
<th>GPA</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.6 to 4</td>
<td>Excellent</td>
</tr>
<tr>
<td>3.1 to 3.5</td>
<td>Very Good</td>
</tr>
<tr>
<td>2.6 to 3.00</td>
<td>Good</td>
</tr>
<tr>
<td>2.1 to 2.5</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>1.6 to 2.00</td>
<td>Moderate</td>
</tr>
<tr>
<td>1.1 to 1.5</td>
<td>Low</td>
</tr>
<tr>
<td>0.5 to 1.00</td>
<td>Very Low</td>
</tr>
<tr>
<td>0.00 to 0.5</td>
<td>Poor</td>
</tr>
</tbody>
</table>
Validity and Reliability

The questionnaire used for the study was adopted from a validated questionnaire developed by a Harvard researcher Ferguson (Ferguson, 2008) and distributed and administered by Cambridge Education. Tripod Student Survey Assessments were supported by and appear in the Bill and Melinda Gates Foundation Measure of Effective Teaching (MET) study of teaching quality (Hawaii State Department of Education, 2013).

Reliability and validity are both necessary for a questionnaire to be able to give the correct results. Reliability is concerned with consistency of results over time whereas validity determines whether the instrument accurately measures what it is supposed to measure. It is to be noted that it is possible for an instrument to be reliable and still not valid. The Tripod survey instruments have been used in hundreds of schools and thousands of classrooms in the USA, Canada and China (Cambridge Education, 2012). According to Tulsa Public Schools (2014), the survey instrument is highly reliable and valid. The survey instrument is formulation of rigorously examined research-based questions about classroom practice and atmosphere. Peterson, Wahlquist, and Bone (2000, as cited in Hanover Research, 2013) also found the tripod survey instrument to be valid and reliable.

A Cronbach’s alpha calculation ran at the request of The George Washington University Center for Equity and Excellence in Education (GW-CEE), found the reliability to be between .80 and .92 (Acosta, Marzocco, Bayraktar & Rivera, 2012). Thus, the instrument is very reliable and valid for this research study. As the research study was conducted in a Thai school, language experts were employed to correctly translate the questionnaire into Thai language. The researcher employed three experts in order to make sure that the questionnaire was
correctly translated into Thai language. The first expert translated the questionnaire into Thai. The translated questionnaire was then checked and confirmed as correct by the second expert. The translated questionnaire was then given for back translation to a third expert who had no knowledge about the original version of the questionnaire. The questionnaire thus translated was then compared to the original version. The back-translated questionnaire was found to convey the same meaning as the original meaning and thus was validated to be true.

**Collection of Data**

After getting necessary permission from the school authority, the researcher distributed the instrument in three phases, and then collected the student achievement record from the school. The instrument was administered to students in their classrooms during their regular periods on 26 February 2015 by the researcher.

The planned process was outlined below:

1. Firstly, the questionnaires with necessary information were given to grade 4 students. The completed questionnaires will then be collected for data analysis.

2. In the second phase of the administration of the instrument the questionnaires were given to grade 5 students and completed questionnaires collected.

3. In the third phase of the administration of the instrument the grade 6 students were given the questionnaires and data collected.

4. Finally the achievement record was collected from the school office and used for final computation.
Data Analysis

Collected data was analyzed in relationship to the stated research objectives of the study by comparing the corresponding items in the instrument. The data will be calculated by using statistical analysis software as show below.

**Research Objective 1:** To determine students’ perceptions towards Montessori teaching method.

For the perceptions of students towards Montessori teaching method a mean and standard deviation response of the items in the questionnaire were computed.

**Research Objective 2:** To determine students’ achievement by the use of Montessori teaching method.

Frequency, percentage, means and standard deviations were used to determine students’ achievement.

**Research Objective 3:** To determine the relationship between students’ perceptions towards Montessori teaching method and their achievement.

Pearson Correlation was used to find out the relationship between students’ perceptions and achievement. The correlation coefficient varied from -1 to 1 where 1 indicated a positive relationship while -1 showed a negative relationship. A value of 0 indicated that no relationship existed between the variables.

**Research Objective 4:** To compare students’ perceptions towards Montessori teaching method among different grades.

To compare perceptions towards Montessori teaching method among grade 4, 5 and 6 students the use of One -Way Analysis of Variance (ANOVA) was employed. As One-Way ANOVA found significant difference among the group, the Post Hoc Multiple Comparison technique (the Scheffe’s Test) was applied to check which pair of means is significantly different.
Research Objective 5: To compare students' achievement by the use of Montessori teaching method among the different grades.

To compare student achievement among grade 4, 5 and 6 students the use of One-Way Analysis of Variance (ANOVA) was employed. If One-Way ANOVA finds significant difference among a group, the Post Hoc Multiple Comparison technique (the Scheffé’s Test) was also applied to check which pair of means is significantly different.
## Summary of the Research Process

<table>
<thead>
<tr>
<th>Research objective</th>
<th>Source of data or Sample</th>
<th>Data collection method</th>
<th>Data analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To determine grade 4, 5 and 6 students’ perceptions towards Montessori teaching method.</td>
<td>Students of grades 4-6</td>
<td>Questionnaires</td>
<td>Means and Standard Deviations</td>
</tr>
<tr>
<td></td>
<td>Grade 4=42</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Grade 5=37</td>
<td>GPA score of the students</td>
<td>Frequency, percentage, means and Standard Deviations</td>
</tr>
<tr>
<td></td>
<td>Grade 6=20</td>
<td>Total = 99</td>
<td></td>
</tr>
<tr>
<td>2. To determine grade 4, 5 and 6 students’ achievement by the use of Montessori teaching method.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. To determine the relationship between perceptions towards Montessori teaching method and their achievement.</td>
<td>Questionnaires And GPA score</td>
<td>Pearson’s Correlation Coefficient</td>
<td></td>
</tr>
<tr>
<td>4 To compare students’ perceptions towards Montessori teaching method among the different grades.</td>
<td>Questionnaires</td>
<td>One-Way Analysis of Variance (ANOVA)</td>
<td></td>
</tr>
<tr>
<td>5. To compare students’ achievement by the use of Montessori teaching method among the different grades.</td>
<td>GPA score</td>
<td>One-Way Analysis of Variance (ANOVA)</td>
<td></td>
</tr>
</tbody>
</table>
CHAPTER IV

RESEARCH FINDINGS

This chapter presents and discusses the statistical analyses of data collected, exploring the relationships between student perceptions in regard to care, control, clarify, challenge, captivate, confer and consolidate and their achievement levels. The purpose of the study was to determine the relationship between student perceptions and their achievement. The study was based on the following research objectives:

1. To determine grade 4, 5 and 6 students’ perceptions towards Montessori teaching method.

2. To determine grade 4, 5 and 6 students’ achievement by the use of Montessori teaching method.

3. To determine the relationship between students’ perceptions towards Montessori teaching method and their achievement.

4. To compare students’ perceptions towards Montessori teaching method among the different grades.

5. To compare students’ achievement by the use of Montessori teaching method among the different grades.

A total of 99 questionnaires were distributed out of which 97 questionnaires were returned, yielding a total response rate of 98%.

Research Objective One

Research objective one of the study was to determine students’ perceptions towards Montessori teaching method.

The researcher employed a questionnaire to find out student perceptions. The questionnaire contained 36 items in a five-point Likert-scale that were divided into seven areas of care, control, clarify, challenge, captivate, confer and consolidate. The
item scales ranged from strongly disagree to strongly agree (1 - 5). Items 10 and 27 in
the questionnaire were reverse coded items and so these two items were recoded in
statistical analysis software. Thus, new values were entered for these responses where,
if *Strongly Agree* was 5, on a 5-point Likert scale, it was now 1, and so on. The scores
of students’ perceptions of their teaching experiences in the seven areas were
analyzed.

1. Students’ perceptions towards Montessori teaching method in the area of Care

Table 5 shows the means and standard deviations of the students’ perceptions
towards Montessori teaching method in the area of care. The total mean score of care
was 3.77, which according to our interpretation key was *positive*. According to our
table, item 5 received the highest mean score (4.06) and item 4 got the lowest mean
score (3.54).

Table 5

*Students’ Perceptions towards Montessori Teaching Method in the area of Care*

<table>
<thead>
<tr>
<th>Item</th>
<th>M</th>
<th>SD</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I like the way my teacher treats me when I need help.</td>
<td>3.86</td>
<td>.83</td>
<td>Positive</td>
</tr>
<tr>
<td>2. My teacher is nice to me when I ask.</td>
<td>3.71</td>
<td>1.03</td>
<td>Positive</td>
</tr>
<tr>
<td>3. My teacher in this class makes me feel that he/she really cares about me.</td>
<td>3.97</td>
<td>1.10</td>
<td>Positive</td>
</tr>
<tr>
<td>4. If I am sad or angry my teacher helps me feel better.</td>
<td>3.54</td>
<td>1.11</td>
<td>Positive</td>
</tr>
</tbody>
</table>
Table 5
(continued)

<table>
<thead>
<tr>
<th>Item</th>
<th>M</th>
<th>SD</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. The teacher in this class encourages me to do my best.</td>
<td>4.06</td>
<td>.93</td>
<td>Positive</td>
</tr>
<tr>
<td>6. My teacher seems to know if something is bothering me.</td>
<td>3.66</td>
<td>1.04</td>
<td>Positive</td>
</tr>
<tr>
<td>7. My teacher gives us time to explain our ideas.</td>
<td>3.59</td>
<td>1.06</td>
<td>Positive</td>
</tr>
<tr>
<td>Total (Care)</td>
<td>3.77</td>
<td>.69</td>
<td>Positive</td>
</tr>
</tbody>
</table>

2. Students’ perceptions towards Montessori teaching method in the area of Control

Table 6 shows the means and standard deviations of the students’ perceptions towards Montessori teaching method in the area of control. The total mean score of control was 3.05, which according to our interpretation key was neutral. It is to be noted that two items in this construct got positive; one item got neutral and another negative. Item 4 with a mean score of 3.57 was the highest, whereas item 3 with a mean score of 2.29 was the lowest.
Table 6

*Students’ Perceptions towards Montessori Teaching Method in the area of Control*

<table>
<thead>
<tr>
<th>Item</th>
<th>M</th>
<th>SD</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. My classmates behave the way the teacher wants them to.</td>
<td>2.70</td>
<td>1.07</td>
<td>Neutral</td>
</tr>
<tr>
<td>2. Our class stays busy and does not waste time.</td>
<td>3.66</td>
<td>1.10</td>
<td>Positive</td>
</tr>
<tr>
<td>3. Students behave so badly in this class that it slows down our learning.</td>
<td>2.29</td>
<td>1.33</td>
<td>Negative</td>
</tr>
<tr>
<td>4. Everybody knows what they should be doing and learning in the class.</td>
<td>3.57</td>
<td>1.07</td>
<td>Positive</td>
</tr>
<tr>
<td>Total (Control)</td>
<td>3.05</td>
<td>.65</td>
<td>Neutral</td>
</tr>
</tbody>
</table>

3. Students’ perceptions towards Montessori teaching method in the area of Clarify

Table 7 reports the mean and standard deviation of the students’ perceptions towards Montessori teaching method in the area of clarify. The total mean score of clarify was 3.80, which according to our interpretation key was *positive*. The table also shows that item 1 had the highest mean score (4.03) while item 6 had the lowest mean score (3.59).
### Table 7

*Students' Perceptions towards Montessori Teaching Method in the area of Clarify*

<table>
<thead>
<tr>
<th>Item</th>
<th>M</th>
<th>SD</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. My teacher explains things in very orderly ways.</td>
<td>4.03</td>
<td>.99</td>
<td>Positive</td>
</tr>
<tr>
<td>2. In this class we learn to correct our mistakes.</td>
<td>3.75</td>
<td>.97</td>
<td>Positive</td>
</tr>
<tr>
<td>3. My teacher explains difficult things clearly.</td>
<td>3.61</td>
<td>1.16</td>
<td>Positive</td>
</tr>
<tr>
<td>4. My teacher has several good ways to explain each topic that we cover in this class.</td>
<td>3.84</td>
<td>1.01</td>
<td>Positive</td>
</tr>
<tr>
<td>5. I understand what I am supposed to be learning in the class.</td>
<td>3.90</td>
<td>.84</td>
<td>Positive</td>
</tr>
<tr>
<td>6. My teacher knows when the class understands, and when we do not.</td>
<td>3.59</td>
<td>1.00</td>
<td>Positive</td>
</tr>
<tr>
<td>7. This class is neat—everything has a place and things are easy to find.</td>
<td>3.85</td>
<td>1.23</td>
<td>Positive</td>
</tr>
<tr>
<td>8. If you don’t understand something, my teacher explains in another way.</td>
<td>3.87</td>
<td>1.00</td>
<td>Positive</td>
</tr>
<tr>
<td>Total (Clarify)</td>
<td>3.80</td>
<td>.64</td>
<td>Positive</td>
</tr>
</tbody>
</table>

### 4. Students’ perceptions towards Montessori teaching method in the area of Challenge

It is clear from Table 8 that student perceptions in the area of challenge...
received mean scores between 3.54 and 4.37 and a total mean score of 4.01 that was *positive* according to our interpretation key.

Table 8

*Students’ Perceptions towards Montessori Teaching Method in the area of Challenge*

<table>
<thead>
<tr>
<th>Item</th>
<th>M</th>
<th>SD</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. My teacher pushes us to think hard about things we read.</td>
<td>3.96</td>
<td>.90</td>
<td>Positive</td>
</tr>
<tr>
<td>2. My teacher pushes everybody to work hard.</td>
<td>4.37</td>
<td>.90</td>
<td>Positive</td>
</tr>
<tr>
<td>3. In this class we have to think hard about the writing we do.</td>
<td>4.08</td>
<td>1.06</td>
<td>Positive</td>
</tr>
<tr>
<td>4. In this class, my teacher accepts nothing less than our full effort</td>
<td>3.54</td>
<td>.99</td>
<td>Positive</td>
</tr>
<tr>
<td>Total (Challenge)</td>
<td>4.01</td>
<td>.66</td>
<td>Positive</td>
</tr>
</tbody>
</table>

5. **Students’ perceptions towards Montessori teaching method in the area of Captivate**

   The means and standard deviation of the students’ perceptions towards Montessori teaching method in the area of captivate are presented in table 9. Items 2 and 4 received mean scores that were interpreted as *neutral*. The total mean score of captivate was 3.50, which according to our interpretation key was *neutral*. Item 3 got the highest mean and item 2 got the lowest.
Table 9

*Students’ Perceptions towards Montessori Teaching Method in the area of Captivate*

<table>
<thead>
<tr>
<th>Item</th>
<th>M</th>
<th>SD</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. School work is interesting.</td>
<td>3.54</td>
<td>.99</td>
<td>Positive</td>
</tr>
<tr>
<td>2. We have interesting homework.</td>
<td>3.14</td>
<td>1.07</td>
<td>Neutral</td>
</tr>
<tr>
<td>3. Homework helps me learn.</td>
<td>3.93</td>
<td>1.07</td>
<td>Positive</td>
</tr>
<tr>
<td>4. School work is not very enjoyable.</td>
<td>3.41</td>
<td>1.23</td>
<td>Neutral</td>
</tr>
<tr>
<td>Total (Captivate)</td>
<td>3.50</td>
<td>.72</td>
<td>Neutral</td>
</tr>
</tbody>
</table>

6. Students’ perceptions towards Montessori teaching method in the area of Confer

It is clear from Table 10 that student perceptions in the area of confer received mean scores between 3.48 and 3.97 and a total mean score of 3.72 that was *positive* according to our interpretation key.

Table 10

*Students’ Perceptions towards Montessori Teaching Method in the area of Confer*

<table>
<thead>
<tr>
<th>Item</th>
<th>M</th>
<th>SD</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. When he/she is teaching us, my teacher asks us whether we understand.</td>
<td>3.82</td>
<td>1.03</td>
<td>Positive</td>
</tr>
<tr>
<td>2. My teacher asks questions to be sure we are following along when he/she is teaching.</td>
<td>3.97</td>
<td>.99</td>
<td>Positive</td>
</tr>
</tbody>
</table>
Table 10
(continued)

<table>
<thead>
<tr>
<th>Statement</th>
<th>Mean</th>
<th>SD</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. My teacher checks to make sure we understand what he/she is teaching us.</td>
<td>3.77</td>
<td>1.00</td>
<td>Positive</td>
</tr>
<tr>
<td>4. My teacher tells us what we are learning and why.</td>
<td>3.81</td>
<td>0.93</td>
<td>Positive</td>
</tr>
<tr>
<td>5. My teacher wants us to share our thoughts.</td>
<td>3.55</td>
<td>1.02</td>
<td>Positive</td>
</tr>
<tr>
<td>6. Students speak up and share their ideas about class work.</td>
<td>3.48</td>
<td>1.14</td>
<td>Neutral</td>
</tr>
<tr>
<td>7. My teacher wants me to explain my answers—why I think what I think.</td>
<td>3.65</td>
<td>1.10</td>
<td>Positive</td>
</tr>
<tr>
<td><strong>Total (Confer)</strong></td>
<td>3.72</td>
<td>0.64</td>
<td>Positive</td>
</tr>
</tbody>
</table>

7. Students’ perceptions towards Montessori teaching method in the area of Consolidate

The means and standard deviation of the students’ perceptions towards Montessori teaching method in the area of consolidate are presented in table 11. Both the items received mean scores that were interpreted as positive. The total mean score of consolidate was 3.71, which again was interpreted as positive.
Table 11

*Students’ Perception towards Montessori Teaching Method in the area of Consolidate*

<table>
<thead>
<tr>
<th>Item</th>
<th>M</th>
<th>SD</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. My teacher takes the time to summarize what we learn each day.</td>
<td>3.84</td>
<td>1.15</td>
<td>Positive</td>
</tr>
<tr>
<td>2. When my teacher marks my work, he/she writes on my papers to help me understand.</td>
<td>3.60</td>
<td>1.23</td>
<td>Positive</td>
</tr>
<tr>
<td>Total (Consolidate)</td>
<td>3.71</td>
<td>1.00</td>
<td>Positive</td>
</tr>
</tbody>
</table>

8. The Summary of Students’ perceptions towards Montessori teaching method

The summary of the mean scores and standard deviations of the students’ perceptions towards Montessori teaching method are illustrated in table 12 arranged from the highest to the lowest mean scores. The total mean score of students’ perception was 3.65 and as such interpreted as positive.

Table 12

*Summary of students’ perceptions towards Montessori teaching method*

<table>
<thead>
<tr>
<th>Students’ perception</th>
<th>M</th>
<th>SD</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Challenge</td>
<td>4.01</td>
<td>.66</td>
<td>Positive</td>
</tr>
<tr>
<td>2. Clarify</td>
<td>3.80</td>
<td>.65</td>
<td>Positive</td>
</tr>
<tr>
<td>3. Care</td>
<td>3.77</td>
<td>.69</td>
<td>Positive</td>
</tr>
<tr>
<td>4. Confer</td>
<td>3.72</td>
<td>.64</td>
<td>Positive</td>
</tr>
<tr>
<td>5. Consolidate</td>
<td>3.71</td>
<td>1.00</td>
<td>Positive</td>
</tr>
<tr>
<td>6. Captivate</td>
<td>3.50</td>
<td>.72</td>
<td>Neutral</td>
</tr>
</tbody>
</table>
Table 12
(continued)

<table>
<thead>
<tr>
<th>7. Control</th>
<th>3.05</th>
<th>.65</th>
<th>Neutral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>3.65</td>
<td>.54</td>
<td>Positive</td>
</tr>
</tbody>
</table>

Research Objective Two

Research objective two of the study was to determine students’ achievement by the use of Montessori teaching method.

For this research objective, the researcher collected the students’ GPA scores from the school record. Table 13 shows that out of the 97 students who participated in study 52 students got Excellent that is their GPAs ranged between 3.6 and 4. This group was 53.6% of the total sample. The table again shows the next group comprising of 24 students getting GPAs between 3.1 and 3.5 and were 24.7% of the participants and interpreted as Very Good; 12 students got Good with GPAs between 2.6 to 3 and were 12.4% of the total sample; 7 students got Satisfactory with GPAs between 2.1 and 2.5 and formed 7.2% of the students and 2 students got Moderate with GPAs between 1.6 and 2 and were 2.1% of the total sample.

Table 13

Students' Achievement (N=97)

<table>
<thead>
<tr>
<th>GPA</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.6 to 4</td>
<td>52</td>
<td>53.6</td>
<td>Excellent</td>
</tr>
<tr>
<td>3.1 to 3.5</td>
<td>24</td>
<td>24.7</td>
<td>Very Good</td>
</tr>
<tr>
<td>2.6 to 3</td>
<td>12</td>
<td>12.4</td>
<td>Good</td>
</tr>
<tr>
<td>2.1 to 2.5</td>
<td>7</td>
<td>7.2</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>1.6 to 2</td>
<td>2</td>
<td>2.1</td>
<td>Moderate</td>
</tr>
<tr>
<td>Total</td>
<td>97</td>
<td>100</td>
<td>Very Good</td>
</tr>
</tbody>
</table>
Table 14 below shows the means and standard deviation of the students’ GPA scores. The total mean score of 97 students was 3.4 in the range of 3.1 and 3.5. Thus, the overall student achievement was interpreted as *Very Good.*

Table 14

*Summary of Students’ Achievement*

<table>
<thead>
<tr>
<th>GPA</th>
<th>M</th>
<th>SD</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total (97 Students)</td>
<td>3.4</td>
<td>.58</td>
<td>Very Good</td>
</tr>
</tbody>
</table>

**Research Objective Three**

Research objective three of the study was to determine the relationship between students’ perceptions towards Montessori teaching method and their achievement.

For the third objective of the analysis, it was hypothesized that there is a significant relationship between students’ perceptions and their achievement. The data in table 15 display the relationship between students’ perceptions and their achievement. As the sig. was found to be .000 which is smaller than .05 it was thus concluded that there is a significant relationship between students’ perceptions and their achievement levels. Thus, the research hypothesis was accepted in this study. And since r was .884 it was concluded that there is a strong positive relationship between students’ perceptions and their achievement levels.
Table 15

*The Relationship between Students’ perceptions and their achievement*

<table>
<thead>
<tr>
<th></th>
<th>Achievement</th>
<th>Sig. (2 tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students’ Perceptions</td>
<td>Pearson Correlation</td>
<td>.884**</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>97</td>
<td></td>
</tr>
</tbody>
</table>

**Correlation is significant at the 0.01 level

**Research Objective Four**

The fourth research objective was to compare students’ perceptions towards Montessori teaching method among different grades.

It was hypothesized that there is a significant difference in students’ perceptions towards Montessori teaching method among the different grades. A one-way analysis of variance was conducted to determine whether differences existed between levels of student perceptions towards Montessori teaching method among the three sample groups of grades 4, 5 and 6.

Table 16

*ANOVA results for Grades four to six students’ perceptions towards Montessori teaching method*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Sum of squares</th>
<th>df</th>
<th>Mean square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>1.749</td>
<td>2</td>
<td>.875</td>
<td>3.171</td>
<td>.046</td>
</tr>
<tr>
<td>Within Groups</td>
<td>25.926</td>
<td>94</td>
<td>.276</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>27.675</td>
<td>96</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As shown in Table 16, the result of one-way analysis of variance showed F=3.171, sig.=.046; which indicated that there was a significant difference of the means between the groups, but in order to see which pair of the means was really
significantly different, a post-hoc multiple comparison (the Scheffe’s test) was continuously conducted.

However, as the data in Table 17 clearly indicates, among each pair, there was no significant difference in the means between the three groups (p > .05). It is to be noted that One-way ANOVA looks at the whole independent variable and investigates its relation with the dependent variable whereas the post-hoc comparisons look at differences among pairs and tests the means of the groups. The reason for failure of detecting any statistically significant post-hoc comparisons might be because ANOVA is more sensitive than the pairwise test and detects lower variability around mean while the post-hoc tests hardly distinguish between the pair’s mean.

In this study, the result of the post-hoc test is more in line with our research objective of comparing the differences of perceptions among the sample groups. Therefore, we focus on the post-hoc multiple comparison and conclude that there was no significant difference among the three groups.

Table 17

Post-hoc multiple comparison of Grades four to six students’ perceptions

<table>
<thead>
<tr>
<th>Sample (I)</th>
<th>Sample (J)</th>
<th>Mean difference (I-J)</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gr. 6</td>
<td>Gr. 5</td>
<td>-.34827</td>
<td>.068</td>
</tr>
<tr>
<td>Gr. 6</td>
<td>Gr. 4</td>
<td>-.32791</td>
<td>.085</td>
</tr>
<tr>
<td>Gr. 5</td>
<td>Gr. 6</td>
<td>.34827</td>
<td>.068</td>
</tr>
<tr>
<td>Gr. 5</td>
<td>Gr. 4</td>
<td>.02035</td>
<td>.986</td>
</tr>
<tr>
<td>Gr. 4</td>
<td>Gr. 6</td>
<td>.32791</td>
<td>.085</td>
</tr>
<tr>
<td>Gr. 4</td>
<td>Gr. 5</td>
<td>-.02035</td>
<td>.986</td>
</tr>
</tbody>
</table>
Research Objective Five

The fifth research objective was to compare students’ achievement by the use of Montessori teaching method among the different grades.

It was hypothesized that there is a significant difference in students’ achievement by the use of Montessori teaching method among the different grades. A one-way analysis of variance was conducted to determine whether differences existed between levels of student achievement by the use of Montessori teaching method among the three sample groups of grades 4, 5 and 6. As shown in Table 18, the result of one-way analysis of variance found that F = 1.376 and sig. = .258.

Table 18

ANOVA results for Grades four to six students’ achievement

<table>
<thead>
<tr>
<th>Variable</th>
<th>Sum of squares</th>
<th>df</th>
<th>Mean square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between Groups</td>
<td>.914</td>
<td>2</td>
<td>.457</td>
<td>1.376</td>
<td>.258</td>
</tr>
<tr>
<td>Within Groups</td>
<td>31.224</td>
<td>94</td>
<td>.332</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>32.138</td>
<td>96</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As sig. was already bigger than .05, the research hypothesis was rejected and conclusion was drawn that there was no significant difference between the means of students’ achievement by the use of Montessori teaching method.
CHAPTER V

CONCLUSION, DISCUSSION, AND RECOMMENDATIONS

This chapter presents a summary of the research study, findings, conclusion, discussion and recommendations for future research on perceptions towards Montessori teaching method.

Summary of the study

In this study, the researcher examined students’ perceptions towards Montessori teaching method and investigated the relationship between students’ perceptions towards Montessori teaching method and their achievement levels. The sample was selected from Mahachai Christian Wittaya School, Thailand (Grades 4, 5 and 6 students). The researcher used questionnaire as instrument for collecting data for student perceptions. The achievement levels, in this case the GPA scores of the students were retrieved from the school record. The questionnaire investigated student perceptions in the areas of care, control, clarify, challenge captivate, confer and consolidate. This study was based on the following research objectives:

1. To determine grade 4, 5 and 6 students’ perceptions towards Montessori teaching method.

2. To determine grade 4, 5 and 6 students’ achievement by the use of Montessori teaching method.

3. To determine the relationship between students’ perception towards Montessori teaching method and their achievement.

4. To compare students’ perceptions towards Montessori teaching method among the different grades.

5. To compare students’ achievement by the use of Montessori teaching method among the different grades.
Based on the objectives 3, 4 and 5, the following research hypotheses were also identified and tested at .05 level of significance:

1. There is a significant relationship between students’ perceptions towards Montessori teaching method and their achievement.

2. There is a significant difference in students’ perceptions towards Montessori teaching method among the different grades.

3. There is a significant difference in students’ achievement by the use of Montessori teaching method among the different grades.

Summary of Findings

The following findings were observed in the research study:

1. Students’ Perceptions

1.1 Students’ perceptions towards Montessori teaching method in regard to care was positive with item *The teacher in this class encourages me to do my best* having the highest score and item *If I am sad or angry, my teacher helps me feel better* having the lowest score.

1.2 In regard to the construct of control, the total mean score of students’ perceptions towards Montessori teaching method was interpreted as neutral.

1.3 Students’ perceptions towards Montessori teaching method in regard to clarify was positive with item *My teacher explains things in very orderly ways* having the highest mean score and the item *My teacher knows when the class understands and when we do not* having the lowest mean score.

1.4 With regard to challenge, the total mean score of students’ perceptions towards Montessori teaching method was interpreted as positive. The item *My teacher
pushes everybody to work hard scored the highest, while the item In this class, my teacher accepts nothing less than our full effort got the lowest score.

1.5 The total mean score of students’ perceptions towards Montessori teaching method regarding captivate was interpreted as neutral.

1.6 Students’ perceptions towards Montessori teaching method in the area of confer was positive. In this construct, the item My teacher asks questions to be sure we are following along when he/she is teaching scored the highest whereas, item Students speak up and share their ideas about class work scored the lowest.

1.7 The total mean score of students’ perceptions towards Montessori teaching method in regard to consolidate was interpreted as positive.

1.8 When looking at all the seven constructs together, the total mean score indicate that students had positive perceptions towards Montessori teaching method.

2. Students’ Achievement

In examining the achievement levels of 97 students, it was found that 52 students (53.6%) got excellent, 24 students (24.7%) got very good, 12 students (12.4%) got good, 7 students (7.2%) got satisfactory and 2 students (2.1%) got moderate. The overall student achievement was interpreted as Very Good.

3. Relationship between students’ perceptions towards Montessori teaching method and their achievement

A significant strong positive relationship was found between students’ perception towards Montessori teaching method and their academic achievement.
4. Comparison of students’ perceptions according to grade levels

A one-way ANOVA conducted to determine whether differences existed between levels of student perceptions towards Montessori teaching method among the three sample groups of grades 4, 5 and 6 found that a significant difference existed between the sample groups. However, according to Scheffe’s post-hoc multiple comparison test the means between the three groups has no significant differences.

5. Comparison of students’ achievement according to grade levels

A one-way ANOVA conducted to determine whether differences existed between levels of student achievement by the use of Montessori teaching method among the three sample groups of grades 4, 5 and 6 found that there was no significant difference between the groups.

Conclusion

The following conclusions were made based on the data analyses and findings of this study:

1. Students’ perceptions

This research used the Tripod 7Cs model questionnaire to explore the extent to which students’ perceptions towards Montessori teaching method effects student achievement. Results indicated that students reported feeling more positively towards Montessori teaching method in regard to the constructs of care, clarify, challenge, confer and consolidate. However, students were not sure of their position towards the constructs of control and captivate. Students’ overall perceptions towards Montessori
teaching method were positive. According to the findings there were no significant differences among the different grade levels towards Montessori teaching method.

2 Students Achievement

Based on the data analysis and findings it was concluded that Students achievement was very good. Most of the students were in the highest achievement level of excellent while still many others were in very good and good. Seven students got satisfactory and only 2 students got moderate.

According to the findings there were no significant differences among the different grade levels in regard to students’ achievement levels.

3. Relationship between students’ perceptions and their achievement

The results of the study confirmed the hypothesis that there is a significant relationship between students’ perceptions towards Montessori teaching method and their achievement. The results of the findings indicate that there is in fact a strong positive relationship between students’ perceptions and their achievement levels.

Discussion

This study provided insight into students’ perceptions towards Montessori teaching method and their relationship to academic achievement. The survey responses revealed that students’ had positive perceptions towards Montessori teaching method. The results of this study showed positive correlation between students’ perceptions towards Montessori teaching method and academic achievement, leaving the researcher to retain the research hypotheses which stated that there is a significant relationship between students’ perceptions towards
Montessori teaching method and their achievement. This section discusses the students’ perceptions, students’ achievement and the relationship between them based on the findings of the study.

1. Students’ Perceptions at Mahachai Christian Wittaya School

The study found that the students at Mahachai Christian Wittaya School had positive perceptions towards the constructs of care, clarify, challenge, confer, and consolidate. The constructs of control and captivate were found to be neutral. The analysis of the data showed highest agreement to the item *My teacher pushes everybody to work hard* and lowest agreement to the item *Students behave so badly in this class that it slows down our learning*. It is very interesting to see how each construct differed in perceptions.

The students had positive perceptions towards care. The students liked the way the teacher treated them when they needed help. The students felt cared for when the teacher answered their questions, made them feel better when they were angry, encouraged them to do their best, gave them time to explain their idea and when the teacher knew when the students were bothered by something.

Gill-Lopez (1995) and Connell and Klem (2004) found out that teacher care was positively linked to academic achievement. According to Thompson (2010), students’ academic engagement rises with the belief that teachers care about them. Gun (2014) found that there is a relationship between teachers’ care and the academic performance of the students. She also suggested that caring is one of the most important qualities of a successful teacher from the students’ perspective.

It is to be noted that in this study the constructs of control was found to be
neutral, meaning that the students neither agree nor disagree. The students were not sure of their position concerning control at Mahachai Christian Wittaya School.

This is in contrast to Ferguson’s (2012) finding that control is the strongest predictor of achievement gains. The finding of the present study is interesting, as it was mentioned earlier that freedom of choice is an important feature of Montessori teaching method. In Montessori teaching method, teachers are just facilitators and students are given freedom to choose their own materials to work with. Freedom of choice of materials in a prepared environment is one of the key features that distinguish Montessori teaching method from a traditional teaching method. As pointed out by Absorbent Minds Montessori (n.d.), the children are free to choose the activities they want to work with from the moment he/she enters the classroom in the morning.

The students had positive perceptions towards the construct of clarify. Clarify measured the teacher’s ability to communicate the lesson effectively. Clarify is related to how well a teacher uses different techniques of teaching to make the students understand. Here again, it was seen that the students were positive about how their teacher explained the lesson to them. The students were positive that the teacher explained lessons in orderly ways and explained difficult things clearly. According to the students, the teachers had several ways to explain each topic.

Hattie (2009) wrote about teaching strategy as a factor influencing student achievement. Clarification using different strategies is definitely important for improved student performance.

In this study, the construct of challenge had the highest mean score indicating that Montessori students were most positive towards this construct. The students were
certain that the teachers at Mahachai Christian Wittaya School challenged them to give their best and had them work hard in their learning. Challenge is another factor influencing student performance. Lack of challenge makes learning boring and uninteresting. Challenges that are reasonable and attainable help to motivate students and improve performance.

In this study, the construct of captivate was found to be neutral, meaning the students neither agreed nor disagreed. When we look at the items under this construct we find that the students were positive towards *School work is interesting* but neutral towards *We have interesting homework*. The students were positive that school was interesting but were not sure of homework being interesting. Again the students were not sure whether school work was enjoyable. However, students were positive that homework helped them learn.

Confere is another construct that was investigated. Conferring is another way of making sure that students are learning the lessons taught by the teacher. The students at Mahachai Christian Wittaya School were positive of this construct. The students were certain that the teachers asked questions, wanted them to share their thoughts and ideas, and made them explain and discuss things. A good teacher will encourage the students to ask questions in the class. The questions asked will provide the springboard for further discussions that will in turn help the students to understand the lesson and improve performance. Tovani (2011) wrote that conferring gives real-time feedback and energizes the learners.

The findings showed that students perceptions towards the construct of consolidate were also positive. Consolidation is aimed towards retention and organization of learning.
The overall students’ perceptions indicated they were satisfied with or had positive attitude towards Montessori teaching method. The outcome of the study revealed that students perceived the construct of challenge more positively than other constructs. They perceived their teacher to be substantially good in clarifying lessons, caring students, conferring and consolidating the lessons. However, no grade level differences existed in terms of students’ perceptions.

2. Students’ Achievement at Mahachai Christian Wittaya School

This study used the school record of students’ GPA scores for measuring student achievement. The analysis of the data showed that the overall student achievement was very good.

Looking at the findings of student achievement at Mahachai Christian Wittaya School it is seen that only 9 students got below good and 53.6% got excellent, which is a high achievement. Out of the total participants 52 students got excellent, 24 students got very good, 12 students got good, 7 students got satisfactory and 2 students got moderate. Data analysis showed no grade level differences in students’ achievement indicating that there were no significant differences among the sample groups as far achievement was concerned.

3. Relationship between Students’ Perceptions and their Achievement

One of the consequential findings of this research study was that there exists a significant relationship between students’ perceptions and their achievement at Mahachai Christian Wittaya School. The results of the study indicated a statistically very strong positive correlation between students’ perceptions and their academic achievement. This meant that the higher the perception score a student had, the higher
would be his or her academic achievement. This finding confirmed the hypothesis that there is a significant relationship between students’ perceptions towards Montessori teaching method and their achievement. The results indicate that students who performed well in studies had positive perceptions towards Montessori teaching method.

The study found that students’ perceptions of care, clarify, challenge, confer and consolidate were positively related to student achievement, whereas the constructs of control and captivate were neutral. The students were not sure of their position towards control and captivate. The data analysis of students’ perceptions suggested that academic achievement can be predicted based on the constructs of care, clarify, challenge, confer and consolidate.

The review of the literature had shown that many researchers have been concerned with factors that affect student performance. The finding of this study was consistent with results of earlier studies conducted regarding students’ perceptions and achievement (Anderman & Midgley, 1997; Fraser, 1986; Gutman, 2006; Ryan & Patrick, 2001).

Wang and Holcombe (2010) conducted a study on adolescents’ perceptions of school environment, engagement, and academic achievement in middle school and found that students’ perceptions of school environment influence academic achievement through their impact on behavior, emotion and cognition.

In another study, on the perceptions of class environment and academic achievement, it was concluded that there is a significant relationship between perceptions of the class environment and students’ academic achievement (Baek & Choi, 2002).
Vandiver (2005) conducted research on the correlation between student perceptions of school climate and positive student outcomes. He found out that there was a significant correlation between student perceptions and American College Test scores. He also found significant correlation between student perceptions on school climate and student performance in Missouri Assessment Program. However, another research on student perceptions of school climate and student achievement found that there was no significant relationship between students' perceptions of school climate and student achievement in GPA (Outhier, 1978). The reason for this finding is undetermined.

Recommendations

Based on the findings of this study recommendations are offered for teachers, administrators and future researchers.

Recommendations for Teachers

Teachers should be aware of the influence of students' perceptions on the academic preparation of all students. A better understanding of this relationship can help in modifying and improving the teaching techniques to suit their interests. The data analysis found the mean scores of control to be lowest and though the total score stood at being neutral it is recommended that the teachers improve on class management and control. One of the main characteristics of a Montessori teaching method is freedom of movement of the students. Hence, the teachers should properly train the students to be independent learners. They should also ensure that students do not disturb other students in the class. According to the data analysis the mean scores of captivate was the lowest and so it is recommended that the teachers at Mahachai
Christian Wittaya School improve their teaching styles and techniques in order to make the lessons more interesting and enjoyable. The teachers need to expand their ideas concerning effective teaching techniques.

**Recommendations for Administrators**

The present research provides educators, administrators, the school board with valuable information to enhance the educational processes, as well as viable ways to involve students in their own academic success. The data of the survey instruments indicate that there are areas where students feel that their teachers are not doing a good job. The school administration is recommended to see that the teachers are properly trained in areas of being a guide or helper to a student. The school administration is recommended to have the teachers take short term counseling courses or seminars or provide training on how to properly care for the students. As the mean scores of control are low it is recommended that the administration organize professional development programs in the areas of classroom management and student control.

As the study shows positive relationship between students’ perceptions and their achievement it is recommended that the school administration collect student feedback on regular intervals. The researcher suggests that such monitoring is important to improve children’s academic achievement by providing better classroom environment. The study provides vital and current data to educators, administrators, the school board and researchers regarding the most desired instructional methods. The school board and administration could use the data to improve teaching methods in the class by adjusting course curricula.
Recommendations for Future Researchers

Since the present study showed a neutral relationship between students’ perceptions of the construct of control and students’ achievement more investigations should be conducted to find out the effects of control upon student performance. It would be interesting to compare and contrast present findings with other Montessori schools in Thailand or even other countries.

Again, since the study found no clear-cut relationship between the construct of captivate and student performance more investigations are recommended in this area in order to find out whether they are related. Similar findings would suggest that Montessori teaching method needs more improvement in this area. If contrasting results are found it would point to the lack of training of teachers at Mahachai Christian Wittaya School.

Another recommendation is to conduct similar studies utilizing different demographic groups or on a bigger scale involving more Montessori schools. Further studies with other Montessori schools would add to the research data and the results could be compared and contrasted to those found in this study.
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Appendix A: Copy of Survey Instrument

Instruction: Read carefully and circle the number closest to your opinion. Each item has five possible answers viz. 1=Strongly Disagree, 2=Disagree, 3=Not Sure, 4=Agree, and 5=Strongly Agree. Please make sure you answer all 36 items.
Thank you for your participation.

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Item</th>
<th>Agree</th>
<th>Not Sure</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I like the way my teacher treats me when I need help.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>My teacher is nice to me when I ask questions.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>My teacher in this class makes me feel that he/she really cares about me.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>If I am sad or angry, my teacher helps me feel better.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
Appendix A: Copy of Survey Instrument

**Instruction:** Read carefully and circle the number closest to your opinion. Each item has five possible answers viz. 1=Strongly Disagree, 2=Disagree, 3=Not Sure, 4=Agree, and 5=Strongly Agree. Please make sure you answer all 36 items. Thank you for your participation.

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I like the way my teacher treats me when I need help.</td>
</tr>
<tr>
<td>2</td>
<td>My teacher is nice to me when I ask questions.</td>
</tr>
<tr>
<td>3</td>
<td>My teacher in this class makes me feel that he/she really cares about me.</td>
</tr>
<tr>
<td>4</td>
<td>If I am sad or angry, my teacher helps me feel better.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>ลำดับ Item Number</td>
<td>คำถามเรื่อง ความเอาใจใส่ของครูผู้สอน</td>
</tr>
<tr>
<td>-------------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>5</td>
<td>ครูของฉันจะคอยให้กำลังใจเพื่อสนับสนุนให้ฉันทำดีที่สุด The teacher in this class encourages me to do my best.</td>
</tr>
<tr>
<td>6</td>
<td>ครูของฉันดูเหมือนจะรับรู้หรือสังเกตเห็นได้ว่า ฉันอาจมีความรู้สึกไม่สบายใจ My teacher seems to know if something is bothering me.</td>
</tr>
<tr>
<td>7</td>
<td>ครูของฉันจะให้เวลาให้ฉันได้ช้าร่าและรับฟังสิ่งที่ฉันได้เรียนรู้ My teacher gives us time to explain our ideas.</td>
</tr>
<tr>
<td></td>
<td>สรุปเรื่อง การควบคุมตัวเอง</td>
</tr>
<tr>
<td>8</td>
<td>เพื่อนร่วมห้องของฉันมีพฤติกรรมเป็นไปตามที่ครูต้องการให้เขาเป็น My classmates behave the way my teacher wants them to.</td>
</tr>
<tr>
<td>9</td>
<td>วิชาของเรามักเกิดขึ้นในช่วงเวลาที่มีความแปลก Orden Our class stays busy and does not waste time.</td>
</tr>
<tr>
<td>10</td>
<td>นักเรียนบางคนที่มีพฤติกรรมไม่เหมาะสมหรือ ขัดขวางการเรียนรู้ในห้องเรียนเนื่องจากทำกิจกรรมบางอย่างที่ไม่เหมาะสม Students behave so badly in this class that it slows down our learning. *</td>
</tr>
<tr>
<td>11</td>
<td>นักเรียนทุกคนรู้สึกว่าพวกเขาควรทำอะไรและ เรียนรู้อะไรในวิชาที่นี้ Everybody knows what they should be doing and learning in this class.</td>
</tr>
<tr>
<td>Item Number</td>
<td>คำถามเรื่อง วิธีการและการสอน การกระทำในเรื่อง การสอน</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>12</td>
<td>ครูของฉันอธิบายอย่างเป็นขั้นตอนและเป็นระบบ</td>
</tr>
<tr>
<td></td>
<td>My teacher explains things in very orderly ways.</td>
</tr>
<tr>
<td>13</td>
<td>ในวิชาเรื่องนี้เราเรียนรู้ว่าจะแก้ไขข้อผิดพลาดของเรามา</td>
</tr>
<tr>
<td></td>
<td>In this class, we learn to correct our mistakes.</td>
</tr>
<tr>
<td>14</td>
<td>ครูของฉันอธิบายเรื่องที่ชัดเจนได้อย่างชัดเจน</td>
</tr>
<tr>
<td></td>
<td>My teacher explains difficult things clearly.</td>
</tr>
<tr>
<td>15</td>
<td>ในวิชาเรื่องนี้ครูสอนให้มีวิธีการสอนที่หลากหลายเพื่อให้เรียนรู้</td>
</tr>
<tr>
<td></td>
<td>My teacher has several good ways to explain each</td>
</tr>
<tr>
<td></td>
<td>topic that we cover in this class.</td>
</tr>
<tr>
<td>16</td>
<td>ฉันเข้าใจเนื้อหาที่ครูสอนไว้ในเรื่องนี้</td>
</tr>
<tr>
<td></td>
<td>I understand what I am supposed to be learning in</td>
</tr>
<tr>
<td></td>
<td>this class.</td>
</tr>
<tr>
<td>17</td>
<td>ครูของฉันรู้เกี่ยวกับเนื้อหาหรือไม่เข้าใจในเรื่องนี้</td>
</tr>
<tr>
<td></td>
<td>My teacher knows when the class understands, and</td>
</tr>
<tr>
<td></td>
<td>when we do not.</td>
</tr>
<tr>
<td>18</td>
<td>ในชั้นเรียนลำดับเรียงลำดับอย่างเป็นกรอบเป็นเรื่อง เรียบร้อย ทำให้ง่ายที่จะหาทุกอย่างต่าง ๆ</td>
</tr>
<tr>
<td></td>
<td>This class is neat—everything has a place and</td>
</tr>
<tr>
<td></td>
<td>things are easy to find.</td>
</tr>
<tr>
<td>19</td>
<td>มีการสอนไม่เข้าใจเรื่องที่ครูอธิบาย ครูมีวิธีการอธิบายให้เข้าใจดียิ่งขึ้น</td>
</tr>
<tr>
<td></td>
<td>If you don’t understand something, my teacher</td>
</tr>
<tr>
<td></td>
<td>explains it another way.</td>
</tr>
<tr>
<td>Item Number</td>
<td>Captivate Statement</td>
</tr>
<tr>
<td>-------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>20</td>
<td>My teacher pushes us to think hard about things we read.</td>
</tr>
<tr>
<td>21</td>
<td>My teacher pushes everybody to work hard.</td>
</tr>
<tr>
<td>22</td>
<td>In this class we have to think hard about the writing we do.</td>
</tr>
<tr>
<td>23</td>
<td>In this class, my teacher accepts nothing less than our full effort.</td>
</tr>
<tr>
<td>24</td>
<td>School work is interesting.</td>
</tr>
<tr>
<td>25</td>
<td>We have interesting homework.</td>
</tr>
<tr>
<td>26</td>
<td>Homework helps me learn.</td>
</tr>
<tr>
<td>27</td>
<td>School work is not very enjoyable.* (Do you agree?)</td>
</tr>
<tr>
<td>Item Number</td>
<td>คำถามเรื่อง ความเข้าใจในเนื้อหาและ การแสดงความคิดเห็น  CONFER</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>28</td>
<td>เมื่อครูสอน ครูจะถามว่าก็รู้เรื่องว่าเข้าใจหรือไม่ When he/she is teaching us, my teacher asks us whether we understand.</td>
</tr>
<tr>
<td>29</td>
<td>ครูของฉันถามคำถามหลายข้อเพื่อให้แน่ใจว่า นักเรียนเข้าใจเนื้อหาที่ครูกำลังสอน My teacher asks questions to be sure we are following along when he/she is teaching.</td>
</tr>
<tr>
<td>30</td>
<td>ครูของฉันเหมือนพี่น้าที่เรารักเข้าใจในสิ่งที่ครูสอนเรา My teacher checks to make sure we understand what s/he is teaching us.</td>
</tr>
<tr>
<td>31</td>
<td>ครูของฉันบอกว่าท่ามกลางเรียนรู้อะไรและมี จุดประสงค์อย่างไร My teacher tells us what we are learning and why.</td>
</tr>
<tr>
<td>32</td>
<td>ครูของฉันต้องการให้เกิดการแลกเปลี่ยนและแบ่งปัน ความคิดต่างๆ ของพวกเรา My teacher wants us to share our thoughts.</td>
</tr>
<tr>
<td>33</td>
<td>นักเรียนหลายคนในชั้นเรียนมีโอกาสพูดแบ่งปัน ความคิดต่างๆ ที่เกิดขึ้นเกี่ยวกับเรื่องที่เรียน Students speak up and share their ideas about class work.</td>
</tr>
<tr>
<td>34</td>
<td>ครูของฉันต้องการให้ผมมีรายละเอียดหลุดของคำตอบ ว่าทำในตัวคิดและตอบอย่างไร My teacher wants me to explain my answers—why I think what I think.</td>
</tr>
<tr>
<td>Item Number</td>
<td>ค่าตามเรื่อง การสรุปความคิดรวบยอดต่อการเรียน CONSOLIDATE</td>
</tr>
<tr>
<td>-------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>35</td>
<td>ครูจะกลั่นฉันสรุปในที่ที่เรียนแล้วครับ</td>
</tr>
<tr>
<td>36</td>
<td>เมื่อครูของฉันตรวจการบ้าน ครูจะเขียนเติมเต็มที่</td>
</tr>
</tbody>
</table>

*หมายเหตุ: ค่าตามข้อใดที่มีเครื่องหมายดอกจัน (**) เป็นค่าที่มีแรงปัญญาแท้ ถ้าคิดว่าตัวด้วยจะแสดงถึงการตอบทางโน้มข้างลบของความพึงพอใจของผู้ตอบแบบสอบถาม

*Reverse coded item. Agreement represents an unfavorable response
Appendix B: School Permission Letter

Mahachai Christian Wittaya School
เลขที่ 927/59 ถนนสุทธิ 1 ตำบลเขื่อนอินท อำเภอพระ这就 จังหวัดสมุทรสาคร 74000 โทร. 0-5441-1166, 0-3481-1272

To

David Basumaty
ID: 5619479
M.Ed (Curriculum and Instruction)
Assumption University, Bangkok

Subject: Letter of Approval to Conduct Research at Mahachai Christian Wittaya School

Dear David,

I am glad to inform you that your request for permission to conduct research at Mahachai Christian Wittaya School has been approved. You can collect required data from the students using your questionnaire and the GPA score from school record. I wish you all the best in your research.

If you have any questions, please contact me at my office.

Sincerely,

Angkana Nopetch
Ms. Angkana Nopetch
School Director
Mahachai Christian Wittaya School
8 April 2015
BIOGRAPHY

David Basumatary was born in Guwahati, India. He holds a Bachelor of Commerce from Guahati University and a Bachelor of Divinity from Serampore University. He moved to Thailand in the year 2008 and has since been working as a teacher. Currently, he is a student in the Master of Education program specializing in curriculum and Instruction at Assumption University, Thailand. He is interested in working with children and young adults.