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

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Abstract: 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.

Keywords: Students' Perceptions, Achievement, Montessori Teaching Method, Care, Control, Clarify, Challenge, Captivate, Confer, Consolidate, Thailand.

Introduction

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

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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.

Objectives

The study was based on the following five 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.

Literature Review

Montessori Teaching Method

Maria 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. 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 12-15years. 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).

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).

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.

(See Figure 1 on the next page)

Method

Participants

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

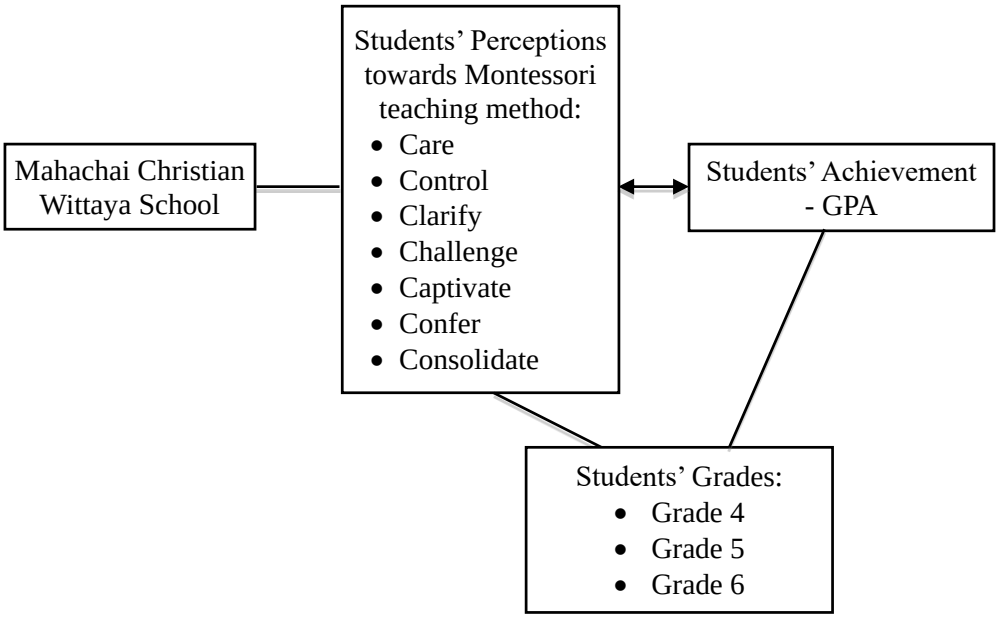

Figure1: Conceptual Framework of The Study

have been selected for the study as they have attained maturity to be able to independently express their views and give feedbacks. There were total 99 students, who were studying at Mahachai School in the academic year 2014, used as the sample for this study.

Research Instrument

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. 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.

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.

Data Collection

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.

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 was calculated by using statistical analysis software. For determining the perceptions of students towards Montessori teaching method a mean and standard deviation response of the items in the questionnaire were computed. Frequency, percentage, means and standard deviations were used to determine students' achievement. Pearson Correlation coefficient 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. To compare perceptions towards Montessori teaching method among grades 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. Students' achievement among grades 4, 5 and 6 were also compared using One –Way Analysis of Variance (ANOVA).

Findings

A total of 99 questionnaires were distributed out of which 97 questionnaires were returned, yielding a total response rate of 98%. Based on the objectives of the research study the following findings were observed.

Students' Perceptions towards Montessori Teaching Method

When looking at all the seven constructs together, the total mean score (3.65) indicate that students had positive perceptions towards Montessori teaching method. However, when looking at individual constructs *captivate* and *control* were found to be having neutral perceptions. No differences were found to exist among the different sample groups as far as students' perceptions were concerned.

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*.

Relationship between Students' Perceptions and their Achievement

A significant strong positive relationship was found between students' perception towards Montessori teaching method and their academic achievement (sig. =.000 & r = .884).

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 had no significant differences.

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.

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.

Students' Perceptions Towards Montessori Teaching Method

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.

Confer 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.

Students' Achievement

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.

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.

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