CHAPTER II
REVIEW OF RELATED LITERATURE
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<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Introduction</td>
<td>20</td>
</tr>
<tr>
<td>2.2</td>
<td>Studies related to attitude towards mathematics and scholastic achievement</td>
<td>21</td>
</tr>
<tr>
<td>2.3</td>
<td>Studies related to classroom environment for mathematics and scholastic achievement</td>
<td>27</td>
</tr>
<tr>
<td>2.4</td>
<td>Studies related to home environment for mathematics and scholastic achievement</td>
<td>31</td>
</tr>
<tr>
<td>2.5</td>
<td>Studies related to anxiety on mathematics and scholastic achievement</td>
<td>36</td>
</tr>
<tr>
<td>2.6</td>
<td>Report of the Studies</td>
<td>40</td>
</tr>
</tbody>
</table>
CHAPTER II

REVIEW OF RELATED LITERATURE

2.1 INTRODUCTION

The review of related literature is an important pre-requisite to actual planning and to the execution of any research work. A scientific approach to a worthwhile study in any field of knowledge requires a sufficient understanding of the related work in the area, as it helps the investigator to find out what is known, what methods and approaches have been used and what problems are still to be solved in the research field.

The study of related literature and research work is very essential and important as it provides proper guidelines. There are many educationists who tried to show the importance of review of the related literature. "A Survey of related literature is necessary for proper planning, execution and right concept of the problems and solutions. It provides guiding hypothesis, suggestive methods of investigation and comparative data for interpretative purpose." (Good, 1959). A summary of the writings of recognized authorities and of previous research provides evidence that the researcher is familiar with what is already known and what is still unknown and untested. Since effective research is based upon past knowledge, this step helps to eliminate the duplication of what has been done and provides useful hypotheses and helpful suggestions for significant investigation." (Best, 2004). The review of related research provides the right direction to think and appropriate track to execute and complete the research. "When completed, it becomes a part of the accumulated knowledge in the field and so contributes to the thinking and research that follows" (Pox, 1969). Thus, the review of related literature not only provides conceptual frame of reference for the contemplated research but also suggests method, procedures, sources of data and statistical techniques appropriate to the solutions of the problem selected for present study. The researcher is able to formulate the hypothesis on the basis of review of related literature which presents the rationale for
the study. In the present study the researcher has used various books, dissertations, handbooks, articles, journals, thesis, web sites as reference material.

The collection of reliable data to examine the achievement in Mathematics was the major concern of the investigator while reviewing the related literature of the study.

2.2 STUDIES RELATED TO ATTITUDE TOWARDS MATHEMATICS AND SCHOLASTIC ACHIEVEMENT

Attitude is surely a strong determinant of the learning outcomes. Every student with similar abilities differs in school attainment due to his attitude towards the subject. Several efforts have been made from time to time to satisfy the query of finding out the effect of Attitude toward Mathematics on learning outcomes in this subject. It is a general observation that students having positive Attitude towards Mathematics get more marks in it in comparison with those students who have negative Attitude towards Mathematics. Much of the work has been done, based on the assumption that attitude affects achievement and some of them are mentioned here.

Aiken (1970) conducted a study on elementary, high school and college levels revealed that even though there exists a positive correlation between attitudes and achievement, they did not always reach the level of statistical significance.

Behr (1973) found that correlation between attitude and achievement in mathematics varies not only with grade level but also with the sex of the student. The study also found that girl’s mathematics marks were more predictable from their attitudes than boys’ marks.

Mishra (1978) conducted a study on attitude towards mathematics of secondary school students and found that boys whose parents were better qualified and in
prestigious professions had more favourable attitude towards mathematics than the others but this was not true in case of girls.

Jain (1979) indentified the major factors which influenced the attainment of mathematics at high school level and he discovered that attitude towards mathematics was found to be one of such factors that played vital role in the learning of mathematics.

Schofield (1982) studied the relationship between attitude and achievement in connection with sex of students, grade level, type of achievement test and time during school, year at which the measurements were taken. Findings indicated that observed relationship between attitudes and achievements were significantly strong in boys than girls.

Patel (1984) and Budhev (1990) found that pupils possessing a favorable attitude towards mathematics were better in mathematical ability than those with less favourable towards science were higher achievers in physical and life sciences.

Kolhe (1985) measured the attitude of students of Jaigaon district towards mathematics and found that the students had a favourable attitude towards algebra, geometry and mathematics as a whole. There were no significant difference between urban girls and rural girls in their attitude towards algebra and geometry and boys had more favourable attitude than girls.

Kaaya (1987) indicated that there were significant differences in mathematics attitude between achievers and under achievers, but no significant differences in between the two sub groups of female achievers and female under achievers.

Padmakumari (1990) revealed in her study that socially advanced and disadvantaged groups differ in their mean score of achievement in mathematics and attitude towards mathematics. It was also found that both variables, achievement in mathematics
and attitude towards mathematics have significant relation with each of socio-economic status, caste, locale and family size.

Sundararajan and Sreenivasan (1990) in their study on higher secondary students’ attitude towards the study of mathematics and their achievement in it found that science students have more positive attitude towards modern mathematics than art students and students studying in private schools have better attitudes than students studying in government schools towards modern mathematics.

Tocci & Engelhard (1991) investigated the relationship of attitude towards mathematics with mathematics achievement and gender using samples from US and Thailand. In both counties achievement was significantly correlated with attitude towards mathematics. Wheat et al. (1991) noticed a relationship between students’ attitude towards Mathematics and their success in college Algebra.

Tocci et al. (1991) conducted a study on achievement, parental support and gender differences in attitudes towards mathematics and found that gender had a significant main effect on attitude towards mathematics and achievement and parental support variables had significant inverse relationship with other attitudes.

Reynolds & Walberg (1992) tested a structural model of mathematics achievement and attitude with a probability sample of 3116 adolescents from the longitudinal study of American youth. It was concluded that prior achievement and home environment influenced subsequent achievement and previous attitude had the most powerful influence on subsequent attitude.

McLeod (1992) revealed that attitude towards mathematics have an important influence on the development of mathematical skills and on the emotional reaction of children associated with mathematics.
Wong (1992) investigated the relationships among mathematics achievement affect and home background for Hong Kong students in grades 7 – 13. Achievement was most closely related to academic and non-academic self concepts and attitude towards mathematics.

Patel (1995) reported that students possessing high attitude towards mathematics were found better in mathematical ability than students possessing low attitude towards mathematics.

Malini (1995) studied the gender differences in certain psychological variables of mathematics domain at secondary school level. The findings showed that the attitude towards mathematics is significantly selected to achievement for girls but not for boys.

Xin Ma and Jianymin (2004) conducted a study to determine the casual ordering between attitude towards mathematics and achievement in mathematics of secondary school students. Results showed the achievement demonstrated casual predominance over attitude across the entire secondary school. Gender differences in this casual relationship was not found but elite status in mathematics moderated this casual relationship.

Thomas (2006) conducted a study to determine the attitude towards mathematics and achievement by combining co-operative learning strategies with instruction delivered using an integrated learning system. Results revealed that students using on ILS for mathematics instruction performed better on standardized tests and were more positive towards math and they worked in co-operative groups than when they worked on the same individually.

Nirmala. P., Antony Raj. S., Merlyn Sanders and Kumaran, D. (2006) in the title Optimisation of Academic Achievement in Mathematics: A Linear Programme Approach made an analysis to study the contributing factors of academic achievement in mathematics; and to study the optimising variables of academic achievement in
mathematics using linear programming approach and found that mathematics information skills, decision making skills and attitude towards mathematics have made a significant contribution towards the academic achievement. All the four factors of attitude to mathematics (Confidence, Usefulness, Success and Teacher) have made a significant contribution towards the maximisation of the aggregate performance in mathematics.

Ganihar, N. N. and Wajiha, A. H. in the title Factors Affecting Academic Achievement of IX Standard Students in Mathematics (2007) (i) to find out the relationship between achievement in mathematics and mathematical creativity, test-anxiety, attitude toward mathematics and achievement motivation of IXth standard students, (ii) to study the significant difference in achievement in mathematics, mathematical creativity, test-anxiety, attitude towards mathematics and achievement motivation of male and female students (iii) to study the significance difference in achievement in mathematics and achievement motivation of IX standard students studying in English and Kannada medium of instruction (iv) to study the significant difference in achievement in mathematics, mathematical creativity, test-anxiety, attitude towards mathematics and achievement motivation of IX standard students studying in schools differing with regard to type of management (v) To determine the relative contribution of the mathematical creativity, test-anxiety, attitude towards mathematics and achievement motivation to the prediction of achievement in mathematics. The findings are (1) Girls are high on achievement in mathematics and test anxiety than boys. But boys are high on mathematical creativity than girls. No significant difference between boys and girls has been found on mathematical creativity and attitude towards mathematics. (2) English medium students are high on achievement in mathematics, mathematical creativity, attitude towards mathematics and achievement motivation as compared to Kannada medium students. (3) The students studying in aided schools are high on achievement in mathematics, mathematical creativity, test anxiety and achievement motivation when compared to government school. (4) Students of aided schools are high on achievement in mathematics, mathematical creativity, test anxiety, and achievement motivation as compared to students of government schools. (5) Students
of unaided schools are high on mathematical creativity. Students of aided schools are high on attitude towards mathematics as compared to students of unaided schools.

Saha (2007) conducted a study Gender, Attitude to Mathematics, cognitive style and Achievement in Mathematics and found that all the three contributes statistically significant difference in achievement in mathematics.

Lawsha Mohamed and Hussain Waheed (2011) in their study on Secondary Students’ Attitude towards Mathematics in a Selected School of Maldives found that despite the lower performance of Maldivian students in mathematics, the attitude of the respondents of this study is fairly positive. The research also showed that the students attitude towards mathematics do not have significant difference between male and female students. Hence there is no gender gap in attitudes.

There are many studies that suggest that there is no significant difference between attitude towards mathematics among male and female students (Mohd et al, 2011; Köğce et al, 2009; Nicolaidou & Philippou, 2003). And there are some other studies which suggest that the attitude of the participants of their study towards mathematics was more positive in the third year than the first year (Grootenber & Lowrie, 2002) and there is a difference between attitude in the grades 6, 7 and 8 (Koğce et al, 2009). Hence it can be said that students’ attitude towards mathematics are very subjective and varies among the students. Several studies had been conducted to find out the relationship between attitude towards mathematics and academic achievement of the students. Most of these studies showed that there is a positive correlation between students attitude towards mathematics and academic achievement of students (Mohd et al, 2011; Bramlett & Herron, 2009; Papanastasiou, 2000; Ma & Kishor, 1997).

On contradiction some studies found that students, who have no positive Attitude in Mathematics, are able to get good marks in Mathematics. In other words, it may be stated that attitude has no effect on the learning outcomes in the Mathematics
(Ngailiankin, 1988). Aiken (1976) in reviewing studies, examining the relationship between attitude and Achievement in Mathematics usually found low correlation which did not always reach the level of statistical significance. Watson (1981), Robert (1982) and Mckethan (1982) have conducted studies and found that attitude had no effect on the outcomes of the Mathematics.

2.3 STUDIES RELATED TO CLASSROOM ENVIRONMENT FOR MATHEMATICS AND SCHOLASTIC ACHIEVEMENT

O’Reilly (1975) investigated the relationship between achievement and classroom environment in 48 mathematics classes in Ontario and found that the set of 15 Learning Environment Inventory Scales (Fraser, 1987) accounted for 67% of variance in raw achievement scores.

Puri (1977) investigated the relationship between classroom climate and achievement motivation on samples from Baroda and found that significant relationship between classroom climate and achievement.

A study on classroom climate in secondary schools by Desai (1979) investigated that the level of classroom climate was positively related to pupils motivation and their academic achievement.

Fraser & Fisher (1980) studied the effect of classroom psycho-social environment on student learning. The investigators revealed that there is significant association between student learning outcome and their classroom environment perception. Fraser & Rentoul (1980) investigated a significant amount of achievement variance between actual and preferred classroom interactions.

Doctor (1984) conducted a study and indicated a significant relationship between classroom and academic achievement. Upadhyaya (1984) conducted a study in Madhya
Pradesh and found that the three aspects of classroom environment (inter personal relationships, goal orientation and system maintenance and change) was significantly related to academic achievement.

Fraser & Brien (1985) explored the association between classroom environment and elementary school students’ achievement.

Byrne et al. (1986) studied the relationship between student achievement and classroom environment perception. Higher achievement scores were found in schools perceived as happy places with many opportunities. In Tobin and Gallagher’s study (1986) based on Grade 8 science students, all class environment scales were correlated significantly with achievement.

Singhal (1991) observed that academic achievement had significant positive correlation to academic motivation, affiliation, teacher support task orientation, competition and innovation-dimensions of classroom social climate.

Padhi (1992) observed that the creative ability and psycho-social characteristic of classroom environment of the students are significantly related to their academic self concept and achievement in school subjects.

Strykowski (1993) provided empirical evidence that instructional and classroom environment as well as home environment influence educational outcomes. Lee’s (1993) findings reported that classroom guidance can positively influence students’ academic achievement in mathematics.

A comparison of perceptions of learning environment between Asian and Anglo-American students with sample size of 1200 students in each group, Huang and Waxman (1995) found that middle school girls had more favourable perceptions than boys had. Also, across both ethnic groups, girls were more involved and attentive in class, more
affiliated with their classmates, and enjoyed their mathematics class more than boys did. Similar results were obtained by Wong and Fraser (1994) in their study with American students.

According to Dunn and Harris (1998) in Sink (2005), judgments on the classroom climate or environment are based on a student perceptual consensus about the educational, psychological, social, and physical aspects of the environment. In other words, environment of a classroom must be taken into account for holistic measures. Teachers, who are also the managers in the classroom, must not overlook any of the four aspects mentioned. They should be a balance among the four aspects in order to generate an effective yet conducive learning environment.

Goh and Fraser (1998) found that girls perceived their classroom environments more favourably than boys although mathematics achievement favours the boys. Results of studies conducted previously provided convincing evidence that the quality of classroom environment in schools is a significant determinant of student learning (Fraser, 1994, 1998). Past researches in Indonesia by Margianti, Fraser and Aldridge (2001), Singapore (Fraser & Chionh, 2000; Goh & Fraser, 1998) and Brunei (Riah & Fraser, 1998) support this general view. These studies suggest that students learn better when they perceive the classroom environment positively. In various studies students’ perceptions of the classroom environment account for appreciable amounts of variance in learning outcome.

Jones (2004); Nnaka and Anaekwe (2000) in their studies found that teacher-student interaction do not influence performance.

Fraser, 1998; Huang, 2000, 2001; Huang & Waxman, 1995; Waldrip & Fisher, 2000; Waxman & Huang, 1998; Wong, Young & Fraser, 1997 said that Students’ observations of their learning environment are influenced by many factors including gender, subject, grade-level, school-type, school-location (city and rural) and ethnic-related differences in classroom learning environments.

A study conducted in Australia revealed that student background variables influence differences in achievement in Mathematics, classroom and school variables also contribute substantially (Lamb & Fullarton, 2000).

Huang (2003) stated that in a research study examining 13,000 students from urban elementary, middle and high schools, female students generally scored higher for their perceptions of their learning environment compared to males. The study also found that there were few differences by subject area, but that there were many statistically and educationally significant differences by grade level.

Within the classroom learning environment variables which have significant influence on students’ academic achievement include time teacher spends in the classroom; physical layout of classroom; classroom climate; teacher’s motivation of students; instructional material utilisation; classroom management skills; teacher-student classroom interaction; student-student classroom interaction and many more (Igiri, 2006; Mgbechi, 2006).

In 2007, Fraser and Kahle investigated on the impact of three different environments (classroom, home and peer) on students’ outcomes in Science and Mathematics. Their research revealed that all three environments were to be consistently
accounted for students’ attitude scores, but only class environment was accounted for students’ achievement scores (Fraser and Kahle, 2007).

A study by Rosas and West (2009), proved that both pre-service and in-service teachers believed that classroom management plays an important role in supporting as well as improving students’ academic achievement. Teachers who are able to manage their classroom well would be able to create a positive yet productive teaching and learning environment, which will motivate students to communicate, collaborate and connect to what is being taught in the classroom. This does not only cater for a particular subject but for every subject taught in school. Thus, it indirectly puts classroom learning environment as one of the factors affecting students’ academic achievement.

Chaturvedi (2009) investigated the effect of school environment and certain demographic variables on achievement motivation and academic achievement of young adolescents. The respondents of the study were 300 students in the age range of 12-15 years of Bhopal. Percentages of marks obtained by the students in last three years were used as measures of academic achievement. The results indicated significant gender difference in academic achievement, the girls scored higher than boys significantly.

2.4 STUDIES RELATED TO HOME ENVIRONMENT FOR MATHEMATICS AND SCHOLASTIC ACHIEVEMENT

The study by Pillai (1965) and Warrier (1966) showed that home environment and socio-economic status of the family have a significant influence on the achievement of pupils.

Dayer (1967) and Kellaghan (1977) found a significant relationship between family environment and measures of academic achievement and intelligence.
Keeves (1972) found that structural variables of the home background are not significantly associated with final achievement in mathematics or science but home attitudes are found to be associated with final achievement in these subjects.

Reddy (1973) found by his study that home environment was prominent as a potential predictor of academic achievement after intelligence.

Tortman (1976) found that family’s environment predicted academic achievement as well as the child’s IQ.

Salunke (1979) studied the home environment, educational climate in the home, emotional climate in the home, economic management and academic achievement and found that the academic achievement of the students was related to their home environment, educational facilities and emotional happiness in the home contributed positively to the academic achievement of students.

Hildebrand & Patraci (1979) found that conceptual understanding of mathematics at each developmental stage was influenced significantly by family environment of the subject. Grover (1979) indicated some influence of aspirations of father and mother over children’s academic achievement.

White (1982) and Subrahmaniyam (1983) found that home environment is one of the factors which influence the academic achievement of a child.

Maitra (1985) in his study on affective correlates of the gifted underachievers found that home environment is an important variable which could cause underachievement among gifted.
Agarval (1986) conducted a study on the effect of parental encouragement upon the educational development of the students and recorded that the high achieving group had been getting higher parental encouragement.

Trivedi (1987) observed that parental attitude was significantly related to academic achievement.

Feldman & Wentzel (1990) reported significant relationship between achievement and parent-child interactions. Also it was found that mother-father hostility is an indirect predictors on son’s academic achievement.

Wong (1992) conducted a study on the relationship among mathematics achievement, affective variables and home background and obtained a positive relation between achievement in mathematics and home background.

Kloosterman & Cougan (1994) found that students who enjoyed mathematics were also confident of their mathematics abilities and there were little correlation between parental support and student achievement.

Keith et al. (1995) examined the influence of parental involvement on the academic achievement of eighth grade Mexican American children. The findings are parental involvement influenced over all academic achievement, as well as promoting gains in the specific areas of reading mathematics, science and social studies.

Khare and Garewal (1996) conducted a study on home environment and academic achievement of elementary school children. The sample comprised of 212 students of middle schools of Bhopal. The results revealed a significant difference in academic achievement of boys and girls. Boys were found to have better academic achievement than girls.
Parental involvement in their child’s literacy practices positively affects children’s academic performance (Fan and Chen, 2001) and is a more powerful force for academic success than other family background variables, such as social class, family size and level of parental education (Flouri and Buchanan, 2004).

Specifically parental involvement with reading activities at home has significant positive influences not only on reading achievement, language comprehension and expressive language skills (Gest, Freeman, Domitrovich, and Welsh, 2004), but also on pupils’ interest in reading, attitudes towards reading and attentiveness in the classroom (Rowe, 1991).

Devi and Mayuri (2003) carried out a study of family and school factors that affect the academic achievement of residential school children studying ninth and tenth classes on a sample of 120 students of Hyderabad city. Data were collected through an interview schedule developed by the investigator to study the family factors. The result indicated significant gender difference in academic achievement and girls were found to be superior to boys in academic achievement.

Sunitha (2005) studied academic learning environment of students from aided and unaided co-educational high schools. The sample of 240 students was selected from the schools of Dharwad city in India. Data were collected from administering home learning environment scale developed by the researcher and academic achievement was taken as average percentage marks of the previous year and two semesters of the current year of the students. The results revealed no significant different in academic achievement of boys and girls. Parental education was also found to have significant and positive relationship with academic achievements of the students.

Bruni et al. (2006) explored the relationships among academic achievement, demographic and psychological factors. On the sample of 380 school students of Italy, school achievement index was used as an instrument to measure their academic
achievement. The findings of the study indicated significant difference in academic achievement of male and female students. Female students were found to have higher academic achievement than males.

Halawah (2006) examined the effect of motivation, family environment, and student characteristics on academic achievement. On the sample comprised of 388 high school students including 193 male and 195 female students of Abu Dhabi district in United Arab Emirates. Grade point average was taken as measure of academic achievement of the students. The results revealed no significant gender difference in academic achievement of the students.

Parents make the greatest difference to achievement through supporting their learning in the home rather than supporting activities in the school (Harris and Goodall, 2007).

Sharma and Tahira (2011) investigated the influence of parental education, parental occupation and family size on science achievement of the secondary school students in western Uttar Pradesh in India. 1500 students were selected as a sample for the study and data was collected through a questionnaire that assessed personal information and science achievement test developed by the researchers themselves. The results indicated that family variables including parental education had significant relationship with the achievement of their children.

Dibyajyoti Mahanta (2014) made a study on the Role of Home Environment and Mathematics Achievement for Students of Secondary Schools in Nagaon District revealed a positive correlation between the home environment and attitudes of the students towards mathematics. The paper concluded that a congenial home environment is an essential factor in moulding the appetite of the students towards mathematics which influences their overall academic achievement in the long run.

2.5 STUDIES RELATED TO ANXIETY ON MATHEMATICS AND SCHOLASTIC ACHIEVEMENT

Hembree (1990) conducted a thorough meta-analysis of 151 studies concerning math anxiety. It determined that math anxiety is related to poor math performance on math achievement tests and that math anxiety is related to negative attitudes concerning math. Hembree also suggests that math anxiety is directly connected with math avoidance. Tocci & Engelhard (1991) found that students with a higher level of mathematics anxiety perform at a lower level of mathematics achievement.

Karen Newstead (1998) in a study on Aspects of Children's Mathematics Anxiety found that pupils who were exposed to a traditional approach, reported more mathematics anxiety than those who were exposed to the alternative approach, particularly with regard to the social, public aspects of doing mathematics. The question raised was whether it was those public aspects of doing mathematics in the presence of teachers and peers which actually evoke mathematics anxiety in many pupils, and not working with numbers or doing sums. However, the majority of pupils in this study reacted with either high or low anxiety to both aspects of doing mathematics.

Extreme anxiety and not controlled, will bring serious consequences to an individual. In terms of mathematics perception, Arem (2003), Curtain-Philips (1999), Tobias (1995) and Zaslavsky (1994) found that many students are not able to deliver a
good performance in mathematics when they are feeling worried or anxious in applying their math skills.

Ashcraft (2002) suggests that highly anxious math students will avoid situations in which they have to perform mathematical calculations. Unfortunately, math avoidance results in less competency, exposure and math practice, leaving students more anxious and mathematically unprepared to achieve.

Ayatollah Karimi and S. Venkatesan (2009) made a study on Mathematics Anxiety, Mathematics Performance and Academic Hardiness in High School Students. The results revealed that significant negative correlation between mathematics anxiety and mathematics performance, a significant positive correlation between academic hardiness and mathematics performance is detected and the correlation between mathematics anxiety and academic hardiness is not significant. It is also found that there were significant gender differences between boys and girls in mathematics anxiety, whereas there are no significant differences between boys and girls in mathematics performance and academic hardiness.

Amy Devine, Kayleigh Fawcett, Dénes Szücs and Ann Dowker (2012) in their study on Gender differences in mathematics anxiety and the relation to mathematics performance while controlling for test anxiety found that no gender differences emerged for mathematics performance but levels of Mathematics Anxiety (MA) and Test Anxiety (TA) were higher for girls than for boys. Girls and boys showed a positive correlation between MA and TA and a negative correlation between MA and mathematics performance. TA was also negatively correlated with mathematics performance, but this relationship was stronger for girls than for boys. When controlling for TA, the negative correlation between MA and performance remained for girls only. Regression analyses revealed that MA was a significant predictor of performance for girls but not for boys.
Effandi Zakaria, Normalizam Mohd Zain, Nur Amalina Ahmad and Ayu Erlina (2012) in their study on Mathematics Anxiety and Achievement among Secondary School Students found that secondary school students’ mathematics anxiety level in Selangor, Malaysia is at a moderate level, there was no significant difference in mathematics anxiety levels of students according to gender and there were significant differences between students’ mathematics achievements based on their math anxiety levels that is students who are high achievers have lower levels of anxiety, while low achieving math students have high levels of anxiety.

Alireza Pourmoslemi, Nasrolah Erfani, Iraj Firoozfar (2013) were made a study on Mathematics Anxiety, Mathematics Performance and Gender differences among Undergraduate Students. The results showed significant differences between men and women’s evaluation anxiety and no significant difference was observed concerning field of study. Also, there is a significant correlation between high level anxiety and low academic performance.

Puteh M. and Khalin S. Z. (2016) in their study on Mathematics Anxiety and Its Relationship with the Achievement of Secondary Students in Malaysia found that the level of mathematics anxiety of Form Four students in Perak Tengah district is at moderate level, there is no difference between the anxiety level of male students and female students and also that there is a negative relationship between mathematics anxiety and mathematics achievement in which students with high math anxiety would show poor mathematics performance and vice versa. The study has found that the types of questions also influence the level of anxiety of students in doing math.

Ma (1999), in his meta-analysis of 26 studies related to learners (at school) found the common population correlation to be -0.27. Ma’s (1999) meta-analysis concluded that gender differences are not statistically significant in mathematics anxiety. Contradictory results have however, also been reported, e.g. a positive relationship between anxiety and performance, i.e. as performance increases, so does anxiety and vice
versa (Ma, 1999). On the contrary, many studies (Patel, 1997; Owens 1992; Abut-Hital & Maher, 2000) do not show any relationship between these two variables.

As Aiken (1970) pointed out, „„no one would deny that sex can be an important moderator variable in the prediction of achievement from measures of attitude and anxiety”“. Specifically, Aiken (1970) stated that „„measures of attitude and anxiety may be better predictors of the achievement of females than that of males”“. Similarly, Eccles and Jacobs (1986) asserted that gender differences in mathematics anxiety are directly attributable to gender differences in mathematics achievement.

A negative correlation between mathematics anxiety and mathematics achievement was reported by (Ashcraft, 2002; Ashcraft & Kirk, 2001; Bandalos, Yates, & ThorndikeChrist, 1995; Cates & Rhymer, 2003; Miller & Bichsel, 2004). The relationship between Mathematics anxiety and mathematics achievement was studied by Ma and Jiangming Xub (2004).

The studies concerning the relationship between gender and mathematics anxiety show different results (Anglin, Pirson, & Langer, 2008; Hall, Davis, Bolen, & Chia, 1999; Meelissen & Luyten, 2008; Penner & Paret, 2008). Some studies report that women have higher mathematics anxiety than men (Baloglu & Koçak, 2006).

These researches form the basis for the present study in mathematics education. This research proceeds to study some of the factors which affect mathematics performance in Tamilnadu district. Hence, from the previous studies it is viewed that all the research variables in the present study have direct influence on the academic achievement of the students. The investigation hopes to gain a valuable insight into these factors.
2.6 REPORT OF THE STUDIES

It is seen from the researches made in India and across the world with respect to the problem area of study, it is understood that many researches have been done based on the variables attitude, anxiety, classroom environment and home environment on the achievement of mathematics. Among which some of the studies yielded positive results and some yielded negative results. But most of the studies showed positive significant relationship than those showing negative relationship.

There are several studies in the area which have repeating earlier studies with different samples or with different school subjects or by adding or eliminating some variables. The survey made here also indicated some agreements but some inconsistencies in the findings.

The investigator decided to take up a study to know how important the research variables are on the achievement in mathematics and to find a relationship between the research variable with the academic achievement of mathematics. The investigator hopes that the findings of the study will be a significant one to the knowledge of the field.