FACTORS AFFECTING THE ACADEMIC PERFORMANCE OF FEMALE STUDENTS IN PHYSICS IN AWI ZONE PREPARATORY SCHOOLS

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Acronyms

NAEP: National Assessment of Educational Progress

GEQAEA: General Education Quality Assurance and Examinations Agency

ABSTRACT

The aim of this study was to examine factors affecting the academic performance of female students in physics in Awi zone preparatory schools. From five preparatory schools in the zone three were selected using simple random sampling method. To meet the purpose of the study quantitative and qualitative designs were employed. Natural science stream female students, physics department heads and school principals have been used as sources of data. Questionnaire, interview and documents were used to gather data. Three heads and three principals were interviewed. Questionnaire was filled by a total of 223 female students. The findings indicate that; the main factors affecting their performance were problems related to home like, lack of parental financial and moral support, parents' low occupational status, making female students family responsibility. The problems related to school such as, stream choice, teachers' attitude and perception, and the availability of laboratory services. And problems related to self also include perception of physics as being too difficult, lack of interest to learn physics. To alleviate these problems some recommendations were forwarded as: - parents should support female students financially and morally, male family members should share domestic chores, schools should give guidance and counseling so as to bring to science, teachers should aware of female students problem and give a tutorial class, the institution also communicate the concerned bodies to fulfill laboratory services, female students should perceive the subject physics is simple as other subjects which are considered easy for them and develop an interest to physics.

CHAPTER ONE

1. INTRODUCTION

1.1 Background of the Study

In today's world having strong background in science subjects, especially in physics seems very crucial in getting into many careers and occupation such as engineering and technology-oriented areas. In the advancement of science and technology in this rapidly changing world, the role of physics is highly pronounced. To insure this, students' performance in science field particularly in physics should be high. However, many researchers revealed that female students are not good at physics as their male counter parts. In this concern, Margery (1984) argued that, the masculine image of science as presented in schools made physics a particularly difficult choice for adolescent girls who were striving to achieve a feminine identity. Once girls have fallen behind, feedback loops within the school tend to increase the boys lead. Furthermore Kahle et al (1993) contended that since science is viewed as masculine image it is considered hard, cold, and an analytical discipline. Girls not anticipate higher performance in sciences subjects. Even teachers and parents do not expect girls to attain high scores in science and technology related fields such as physics, electricity. These important figures do not also encourage them to pursue study science.

In their massive international study on science achievement of boys and girls, Comber and Keeves found that "in all countries boys excelled girls in science subjects, the difference being small in biology, intermediate in chemistry, and very large in physics"(cited in Yalew, 1997:31).

Evidence from every part of the world indicates that gender in balance in basic and applied sciences are problems of both developed and developing countries. Around the world the majority of female students appear to be disinterested in studying physics. As a result, gender disparity in science fields of studies and occupations seems to be worldwide phenomena. To illustrate this situation the case of some countries is given bellow.

National Assessments in the United States revealed that the magnitude of the gender gap varies with scientific domain. Differences are largest for physics (Pergamon, 2003). In almost

Asian countries, females do not choose science, technology which is the primary fields of study for females (Jandhyal, 1993). Instead they tend to study social science. In South Africa, females tend to avoid natural science fields; that have been traditionally considered as male domains (Geet, 1997). So they tend to concentrated in areas that are considered as feminine. In Kenya, females participation in science and technology is extremely low (Ngau, 1999).

In Ethiopia, Yalew (1997) asserted that the mean scores of boys on physics performance are higher than their female counter parts. Furthermore, boys seemed to perceive physics as an important subject for their future career goals and every day activities.

As I can observed the male and female results from rosters and higher education entrance examination of grade 12 students in Awi zone preparatory schools the gender gap in physics is large. The Ethiopian First National Learning Assessment of grades 10 and 12 students (2010) showed that, grade 12 physics mean score is 38.5 percent and 31 percent for males and females in Amhara region respectively that is, boys performed better than girls and the differences are statistically significant. Accordingly, since Awi zone is in Amhara region, so does the performance of male students is better than female students in physics in Awi zone preparatory schools.

It is believed that, gender in balance in science particularly in physics is a result of a combination of factors that hinders females from pursuing in this field. Based on this idea Pergamon (2003) revealed that the explanation for this paradox lies in a complex mix of factors culture, institutions and level of economic development jointly give rise to both barriers and incentives to education for women in countries around the world. The cultural factors emerge from the gender specific beliefs and biases that prevail in the society (Presser, 1997). Due to these gender biased perceptions that prevail in the society, females do not aspire of careers that perceived as male domains because of the fear of disapproval they many get from others (Karin, 1993).

Although Atsede's (1991) study vividly portrayed representational disparities of males and females, factors affecting for such discrepancies were not well discussed. And Yalew's (1997) study examined the effects of gender on perceived importance, attitude, self-efficacy and

performance in physics. In his study also the crucial factors affecting the academic performance of female students in physics were not clearly addressed.

Thus the purpose of this study is to asses those factors affecting the academic performance of female students in physics particularly in Awi zone preparatory schools.

1.2 Statement of the Problem

Almost all researchers mentioned that beginning from secondary schooling, boys' interest in physics seems to flourish while that of girls diminishes. This could be reflected in enrollment, confidence attitude and achievement variances in boys and girls in physics. "Many investigators indicated that science, particularly physics is viewed as a realm of masculine endeavor" (Kelly and Smail, 1986; Chambers and Andre, 1995; Kahle et al, 1993, Archer and Mc Donald, 1991; Bell; 1991, Mergarry, 1984) (cited in Yalew, 1997:31)

The gender gap in science information remains large internationally, the gap for understanding science concepts is small and declining and science grades traditionally favor females rather than males. In scientific information, gender differences are larger in physics than in other domains (Pergamon, 2003).Poor performance at primary and secondary levels education with particular reference to science, mathematics & technical subjects hinder girls' entry in to and success in higher levels (Edda, 2000).

In most secondary education level of Ethiopia, especially in rural areas female students' academic choice is committed to specific area. It is true that girls tend to enroll in education and art subjects and to be under represented in science subjects and mathematics where boys and men dominate (Odaga and Heneveld 1995). This condition in the future will lead to more gender in balance in the labor force and brings negative impact on the national capacity building in various sectors.

Gender in balance in different fields of study is a result of many factors. According to Hyde, (1993), the cultural factors that arise from gender specific beliefs and biases in a society do not allow females to aspire careers that all perceived as male domain due to being afraid of disapproval from others.

The school environment such as teachers, peers, learning materials plays vital role in transmitting all forms of beliefs that reinforce genders inequalities. Among this school factors particularly teachers have strong power influence on the attitude, interest, and achievement of students in a given subject. The gender stereotyping of subjects promoted by teachers appears to be a major constraints for females to a given field of study (khan 1993).

To improve girls' academic performance it requires a clear understanding of the factors affecting them. Hence, this study will be a practical step to examine the status of girls academic performance and investigating the in and out of school factors which affect female students academic performance of physics in Awi zone preparatory schools.

Accordingly, the following research questions are formulated to be investigated in the course of study,

- What are home related problems, female students face in their academic performance of physics?
- What are school related problems that affect female students' academic performance in physics?
- What are self related problems that female students encounter in their academic performance of physics?

1.3 Objectives of the Study

1.3.1 General Objective

The main objective of this study is to identify factors affecting the academic performance of female students in physics in Awi zone.

1.3.2 Specific Objectives

Based on the main objective the following specific objectives were set:

-To assess problems those are related to home, school, and self on females' academic performance of physics

-To find out opportunities offered for female students of academic performance in physics

-To suggest alternative solutions to alleviate the problems faced for females performance in physics.

1.4 Significance of the Study

In general this study will be important for the following reasons

- To design strategies that may help to bring balanced achievement of girls in physics of preparatory schools.
- To provide ideas to teachers, school principals and educational personnel to review their approach in a way those enhance females' academic performance in physics.
- To point out crucial factors influencing females' academic performance in physics with their solutions.

1.5 Delimitation of the Study

Awi zone is in Amhara region located at a distance of 116 km from the capital city of the region, Bahir Dar. The zone has seven woredas, three city administrative and five government preparatory schools. Thus, this study focused on five preparatory schools of the zone. Therefore, it would be sounder if it included all preparatory schools of the zone. However, for the sake of its manageability, and scarcity of resources, it was delimited to three randomly selected preparatory schools (namely, Danglla, Injibara, and Chagnie). Besides, it focused on thematic organizations of literature which insights home related, school related, and self related problems of female students' academic performance in physics.

1.6 Limitations of the Study

The study has got some limitations. Because of time and financial constraints it was difficult to address every specific problem. In some instances, there was lack of cooperation from the school principals and head teachers due to the burden of work. But whatever the inconvenience was: I did my best to convince the above bodies and then they were willing to collaborate with me in giving the information needed on the subject matter.

1.7 Operational Definition of key terms

Preparatory school – second cycle of secondary education (11 – 12) in which students prepare for Higher education

Performance – students' achievement in relations to attainment of objective

1.8 Organization of the Study

This study is divided into five chapters. Chapter one consisted of the introduction, background of the study, statement of the problem, objective of the study, significance of the study, delimitation of the study, limitation of the study, operational definition of key terms and organization of the study. Chapter two included the review of the study. Chapter three also consisted of research design, sources of data, population, sample and sampling techniques, instruments and procedures of data collection, data analysis techniques. Chapter four contains presentation, findings and analysis of the study. Finally chapter five presented the summary, conclusion and recommendations.

CHAPTER TWO

2. REVIEW OF RELATED LITERATURE

2.1. Gender and Schooling

The way men and women are socialized throughout the world into gender roles, and the implications of this socialization process for educational participation, learning, social indications, and life outcomes are subjects with profound consequences for individuals and society. One definition of socialization is a "complex set of processes covert and explicit, the train individuals to take their place as a responsible member of society" (Lipman-Blumen, 1984:66)

Socialization assumes inculcation of norms and values by agents such as family, school, and media. In this process, roles are the means by which individuals fit into the various areas of social fife .Gender roles, specifically, are the behaviors and expectations based on social attributions of gender: these attributions involve a multicity of rules that range from what is "proper" to what is "taboo" for men and women. Some feminist analyses would prefer to concept "patriarchal ideology" to emphasize that the values and norms inculcated through the gender socialization process are arbitrary (i.e., have no intrinsic truth) and depend on the will and power of the dominant group-men. Even through patriarchal ideology assumes various forms from society to society; its fundamental commonalties include the value placed on motherhood and domesticity, and the strong dichotomy between feminity and masculinity (Pergamon, 2003).

Most of the discussion about the unequal educational development between the sexes, especially in developing countries, has focused on access of girls to schooling (usually based on gross enrollment rates). Over time, girls have achieved parity in enrollment in primary and secondary education in most industrially advanced countries and in some parts of Latin America and East Asia. In many African, Middle Eastern, and South Asian countries, however, girls' primary and secondary school enrollment lags substantially behind that of boys. Women's participation in higher education tends to be lower than that of men in most countries.

Access to schooling is affected by cultural beliefs, the economic conditions of the family and the nation, and the educational supply. A host of factors outside the school system have been identified as affecting the enrollment and participation of girls in education, such as lack of time due to domestic work (cooking, obtaining water and wood, caring for minor siblings, etc), child labor, early marriage, low aspirations, distance to schools, and lack of female teachers. While the entire list of factors is quaint extensive (Anderson, 1988; Stromquist, 1989).

Access to schooling is only part of the quest for equal education staying in school is no less important, Women under go fewer years of education than men, a pattern observable in all developing regions. In only 3 out of 24 African countries (Botswana, Lesotho, and Swaziland) do women stay in schools longer than men (Hyde, 1989) All three are states where demand for male labor in the mines of South Africa creates households headed by females, thus weakening patriarchal ideology about women's home bound roles.

2.2. The Gender gap in Science Performance

The achievement of males and females in school science can be assessed by comparing knowledge of scientific information, understanding of scientific concepts, grades in science classes, and student's beliefs about the nature of scientific knowledge. Ideally, achievement would be assessed among those with an equal opportunity to learn. Realistically, since many learning opportunities are informal occurring in families. At science centers, in libraries, and in apprenticeship programs, such analyses are impossible.

The general narrowing of the gender gap in academic achievement is less apparent in science than in verbal ability, spatial ability, and mathematics ability (Hyde and Linn, 1986, Linn and Hyde, 1991). Over all, the gap is narrowing more for understanding of scientific concepts than for knowledge of scientific information. Based on knowledge of scientific information, most national and international assessments measure students' ability either to discriminate or recall scientific information. Tests typically all major domains of science including physics, chemistry, biology, geology, earth science and health science this international assessment reveals large discrepancies in performance between students from different countries as well as gender gap in knowledge of science, with males out performing females (LaPoint et .al 1989).

Moreover, national assessments in the United States reveal that the magnitude of the gender gap varies with scientific domain. Differences are largest for physics, and smallest for biology and health science. The gap also varies with age, getting larger as students become older Jacobson and Doran, (1985); National Assessment of Educational Progress ((NAEP), 1988; Keeves, 1992; PostlethWaite and Wiley, 1992; Rosier and Keeves, 1991).

The gender gap in science achievement is smaller in the United States than in other countries, but still larger in physical science and among 17- year old students. In understanding of science concepts, research studies often assess understanding of scientific concepts such as "isolation of variables" or "interpretation of experiments". Understanding of concepts is commonly measured with short answer or essay questions. Meta-analyses reveal few gender differences in performance Hyde and Linn, (1986); Steinkamp and Maehr, (1984); NAEP, (1988). For example, on the American Advanced placement biology test, females are more successful on the essay, and males are more successful on the multiple choice questions. Both essay results and the multiple-choice results are predictive of subsequent grades in science (Linn, 1992). One explanation for this pattern is that essay questions draw on integrated knowledge of a topic by the examinee, while multiple choice items draw on examinees' understanding of all the topics in the field. Females earn higher science grades than males at all levels of school science from elementary to college (Grandy, 1987). Ideally, school grades assess science understanding as well as recall of information through in class. Yet, among students who take the same course, males still out perform females on national assessments (NAEP, 1988; Postethwaite and Wiley, 1992; Rosier and Keeves, 1991).

Beliefs about scientific knowledge; more and more courses are including, among their objectives, the goals of imparting a realistic view of science. Investigations of students' beliefs about scientific knowledge reveal large individual differences. Some students have a realistic view of science and recognize the relationship between scientific knowledge and complex scientific problems. Other students believe that the best way to learn science is to memorize rather than to understand, and see no relationship between the science they study in their science classes and scientific debates in news papers and on the radio (Linn et al., 1991).

Assessment reveal that males and females are equally aware of the nature of science (NAEP, 1988).Females may understand the nature of science in part because they are more likely than males to view science as socially constructed(Gilligan, 1982; Keller, 1986).

Generally the gender gap in science performance is summarized by Pergamon (2003:2427) as:

> *The gender gap in science information remains large internationally, the gap for understanding science concepts is small and declining, and science grades traditionally favor females rather than males. In scientific information, gender differences are larger in physics than in other domains, and for older rather than younger students. In addition, when beliefs about scientific knowledge are measured, gender differences are not typically found. These patterns of achievement are consistent with formal and informal opportunities to learn science.*

2.3. Female Students' Academic Performance in Secondary Schools

The results found by various researchers showed that boys and girls achieve almost equivalently in the elementary level (e.g. Margery, 1984); however, when they are transferred to the junior, secondary and tertiary levels, performance variations between girls and boys come to light (Devis and Fossey, 1985; Doherty and Dawe, 1985; Hilton and Bergland, 1978; Hadden and Johnstone, 1983; comber and Keeves, 1973; and Kelly, 1978).Accordingly, in secondary schools there are the two tracks from which students can choose are social science and natural science streams. So we can see female students' attitude and performance in each stream.

2.3.1 Social Sciences

Many studies showed that female students tend to enroll social science stream and they also do have a good performance in this stream. B.Jandhydle (1993) ascertained that in almost all Asian countries the two main fields of study that are female students choose are education and business administration while engineering is the primary field of study for males. Similarly,

Anne (1993) pointed out that in almost all developing countries females' development in higher education is very much concentrated in the humanities, home economics and art. She also added that in secondary schools females are highly concentrated in general education programs while they are underrepresented in vocational and technical streams.

2.3.2 Natural Sciences

The low performance of female students in science and technological fields appear to be a problem of both developing and developed countries. This situation is stated by Finn et.al (1982:118) as "in all parts of the world boys are directed into science and mathematics curricula more actively, while girls are encouraged or guided toward languages and liberal arts."They also pointed out that, Eastern Europe and Soviet Union are countries where is relatively smaller gender bias careers. But still, in these countries gender differences in science enrollment exists. In developing countries, where the gender disparity at all levels of education is more pronounced, it is evident that the gender inequality in science fields is more magnified. As Mensch Barbara et.al (1988) indicated, although many developing countries succeeded in widening the access of education, still female's access to education lags behind males. Many studies showed that girls in African countries are less likely to go to science and engineering fields. For instance in South Africa, girls do not have the tendency to enroll in mathematics, pure or applied science fields. When they enroll in science subjects it is usually Biology or Zoology (W0lpe et.al)

2.4. Factors Affecting Female Students' Academic Performance

2.4.1 Home related factors

- **Parents' socioeconomic status**

Socio-economic status is measured in terms of parents' occupations educational level, and house hold income .Academic achievement of low income students in urban areas is greatly related to their level of socio economic advantage. Shultz (1993) argued that socio economic status appears to be affecting achievement motivation desire which in turn affects academic performance. As socio economic status of their family increased their academic performance

will be increased because, if the socio economic status of parents is strong enough they are in a position to provide sufficient materials for their children. Otherwise students from low economic status family engaged themselves to part time work and this influences academic achievement of students negatively. Jacques (1987) explained that students were engaged in part-time employment to cover school fees and to fulfill other materials. On his study the effect of part time employment on academic achievement of high school students, he reported that the non-employed students, grade point averages were higher than the grade point of the employed students.

The fewer years of education attained by women in Africa and other developing regions reflect the increasing demands that domestic work places on girls as they become older, and their internalization of domestic values. It is also clear that women's participation in education (both in terms of enrollment and time spent in education) is determined by the economic situation of the family to a greater extent than is that of men. Accumulative result of this fact is that among those enrolled in higher education more women than men have parents who are highly educated or are high economic professions (Pergamon, 2003) .Thus, socio economic status symbolizes a Varity of values, attitudes and motivations related to academic performance. Indicating the impact of socio-economic status issue in education, Smith (1978:97) says "learners from families and neighborhoods and areas that are economically deprived or poor are different in some way from learners who come from middle class families or families with more than enough money ---children from the poverty belt are found to be as group less eager to learn and generally less motivated to do the kind of thing that are expected of them in schools." As it is stated above socio-economic status is a significant factor in determining the achievement level of students.

Parents' educational background is likely to be one of the factors that affect female students' educational performance. For instance if the head of the family is highly educated his children are likely to receive some encouragement, guidance and even help in academic work. Almost all educated parent's wishes and expected better performance of their daughters (King and Hills, 1991) also stated that parents who are educated might have a positive attitude about female

education or provide a more stimulating environment for education than other parents. Thus, this situation in the school will encourage female students to have a better academic performance.

In accordance with this, the results of studies in several countries summarizes that a mother's education improves the educational attainment of her children, particularly that of daughters. After controlling for various other factors such as parents' occupation and wealth and school characteristics, the mother's and father's education levels were found to have different effects on children's schooling. In Pakistan, where women's education levels are very low, the mother's education has no discernible effect on the son's education, but a small positive effect on the daughter's. In Indonesia, the mother's education has half the effect of the father's on sons but a slightly larger effect on daughters. In the Philippines, the effect of the mother's education is about twice that of the father's and larger for daughter's. Likewise, in Peru, the effect of the mother's schooling is larger than that of the father's for daughters, but smaller for sons (Pergamon, 2003; 2415). He further more, states that the effect of mothers schooling on measures of students' academic achievement. The mother's schooling can have a large positive effect on mathematics achievement scores, student motivation and study habits. The greater effect of the mother's education on daughters than sons could be a result of the traditional sexual division of labor within families. Mothers tend to spend more time with their daughters, especially in the context of performing household work, while fathers spend more time with their sons. However, the result might also reflect differences in the preferences of mothers and fathers, and the stronger influence of the more educated mother on the allocation of family resources.

In contrast to this idea, Kelly and Elliot (1991) states through, the strength and form vary; the impact of father's schooling on girls' education is wide spread. In many social background categories females' advantage is found to be more substantial than do sons only when father' schooling is relatively high.

- Parents' Attitude

Homes are places where gender roles begin at the early age of childhood. Children at the very young ages learn from their families, the way they should act, the type of work they are expected to do, and the role they are expected to play in their future family life. The differential treatment of boys and girls by parents in accordance to the culturally set gender rules begin at home. This fact is well illustrated by Mensch(1998:16) as:

> *Girls' home are not just residential bases; they are also the loci of powerful forces that shape every aspect of girls' existence, including their time use, access to school, and paid work and social status. Many adolescent girls are virtually in trapped in the domestic sphere. This confinement serves two purposes; it keeps girls out of the public arena and it keeps them in the* household, where they *undergo their apprenticeship for adulthood an intense training for a lifelong role as wife and mother.*

Parents generally, encourage their daughters to be "docile" and "compliant" so that they will be able to play the role they are expected to play as wife and mother in their future life (Rubbo Anna, 1975:339). The expected familial roles and responsibilities of girls are those duties that bind them to the domestic sphere, such as child care, food preparation and other time-consuming activities including, the fetching of water cleaning and agriculture work. Contrary to girls, boys are encouraged to develop some degree of autonomy and independence from the family (Jacqeline, 1970). The domestic roles expected from boys are out –door activities which are considered to be more productive tasks that generate income (Finn, Reis and Dulburg, 1982).

- **Socio Cultural Factors**

In certain settings, socio-cultural factors (such as norms proscribing the societal, economic, and financial roles of women) and religion strongly influence the behavior of parents by imposing a heavy cost on nonconformist behavior. In countries in which female are usually secluded, girls

may only attend schools that do not admit boys or only those that employee female teachers. The importance of preserving a young girl's reputation in such cultures leads to high dropout rates of girls at the onset of puberty (Caldwell et al., 1985; Papanek, 1985). When girls grow up, they become more and more influenced by culturally set gender rules. Regarding this, Mensh (1998:2) states that:

> *Girls and boys in culture throughout the world are treated differently from birth on ward but, at puberty this gender divide widens. During adolescence, the world expands for boys and contracts for girls. Boys enjoy new privileges reserved for man mobility, opportunity and power girls are systematically deprived of these aspects.*

As Mensh explicitly put it, adolescent girls are made to be restricted to less life choices and opportunities by culturally sanctioned gender rules imposed by society and sometimes perpetuated by girls themselves. This situation is reflected by their reluctance to participate in the fields of study that are traditionally considered as male domains. Society's perceptions and attitudes towards gender roles and responsibilities have great impact on the educational choice of girls. Consequently girls do not tend to peruse, mathematical, pure or applied science in schools. Furthermore, Zimmerer and Bennett (1987) state that, in almost all cultures, males were admitted to science courses before females and males hold positions of power and leadership in science. This situation has to the wide spread view that science is a male domain and that science courses are more useful for males than females. In addition to this, socio cultural factors influence the decisions to enroll girls to school or to with draw them from school. Girls' own decisions to drop out of school, their academic performance and their grade level attainment are also influenced by the socio cultural factors (Odaga and Heneveld, 1995).

Similarly, the culture influences the division of labor with in sexes that affects girls education is the demand that their time be put to alternative uses. Parents may not be able to afford the opportunity costs of educating children, which vary by sex. With few exceptions, girls do more home and market place work than boys (Hill and King, 1993). They cook; clean the houses fetch water and help their mothers care for younger children, especially those who are ill. In Nepal

and Java, for example, most young girls spend at least one –third move hours per day working at home and in the market than boys of the same age, and in some age groups as much as 85 percent more hours (Nag et al, 1980).

2.4.2 School related factors

- **School organization and management**

The quality of school management can be conceptualized in a frame work of active and responsible head masters who strive for achieving school objectives. Accordingly, head masters influence in school improvement can be expressed in various forms encouraging teacher's participation in solving problems frequent evaluation of teachers' performance; guidance on the use of curricula and encouragement of different approaches of teaching and competence in budgeting and accounting for materials inputs (Delors et al, 1996) he also argue that research as well as empirical observation shows that the school head is one of the main factors in determining school effectiveness. Furthermore, the scholars believe that a good school head is capable of establishing effective team work, and is seen as being competent and open-minded to achieve major improvements in the quality of their school. An effective school organization is the totality of the head master's management capability, a feeling of collegiality among teachers, norms of achievement set and the school's legitimacy in the broader community (fuller, 1986). A major challenge for those who study schools and school administration is to learn how organizations contribute to students' success whereas; teachers are directly responsible for teaching in the class room. Administrators are charged with development of organizations that facilitates teaching and learning (Murphy & Lovis, 1999; Roman (in Goddard Sweet Land and Hoy, 2000).

To this end, special training that helps them to discharge obligations and increased responsibilities are some of the factors which are significantly important. Still, another important learning input that is closely related to school management is inspection: Inspectoral mechanisms have also to maintain professional discussions with teachers to develop

knowledge, methods and sources of educational information. This helps to identify ways of rewarding good teachers in school.

In general, school management ensures that schools have competent management personnel. It is also a venue for introducing a pool of ideas about the aims and methods of teaching with in specific settings. The overall emphasis in school management is that schools have competent personnel and to enhance learning out comes, where teachers' role is geared to achieving them (Delors, et al, 1996).

- **Teachers' effect/ attitude**

Good learning outcomes are associated with teachers who plan for teaching and put into practice what they have learned in their pre-and in service courses through remediation of students (female & male) work regularly. Accordingly, courses will not provide equal experiences for males and females unless the expectation of teachers changes. Much research indicated that teachers are more likely to ask males rather than females to answer complex questions and to give feed back to females, but negative feedback to females. Such behavior reinforces the view that science is a male domain and stands in the way of effective and equitable course experience for males and females (Tobin et.al, 1990:132). In this concern, Pergamon (2003) argued that, teachers, as products of their society, often endorse patriarchal ideologies. Teachers who up hold dominant beliefs about men's responsibilities are seldom conscious of their attitudes and practices. In addition, the barriers to girls' education begin earlier-at primary school level where teachers and text books may project attitudes that discourage achievement by girls or promote stereotypes of girls less capable than boys at learning technical subjects or mathematics. Studies have found that single sex schools may be more effective for girls learning. In Thailand, these schools certainly make a difference even after controlling for such factors as socio economic, home back ground and school resources, girls achieve more in single sex schools than in coeducational schools, while boys did better in the latter (Jimenez and Lockheed, 1989).

Teachers' method of instruction and ways of organizing their classroom has been found to help improve academic performance of students. Consequently, according to Avados and Haddad (1981) teacher's attitudes and skills that have bearings on school effectiveness include:

- Academic and intellectual profession;
- Creativity and invectiveness;
- Internal motivation for teaching;
- Participation in the in-service teacher training
- Teacher's high expectation for student performance
- Knowledge of subject matter; and
- Teacher's beliefs about the purpose and utility of schooling

However, according to Pergamon (2003) science teachers can discourage students by labeling their ideas as "misconceptions" rather than recognizing these ideas as attempts to construct understanding complex events. Helping students construct more powerful ideas rather than telling students to substitute scientist's ideas for their own builds lasting knowledge but takes instructional time. Teachers often resort to telling students the "correct' scientific ideas because there is no time to explain or because the explanations in the text book are inaccessible to students. As a result, few students gain understanding of science and most resort to memorization. This knowledge telling approach to instruction combined with the observed propensity of teachers to give more positive and constructive feed back to males than females is likely to encourage males to memorize science information and females to avoid science. Many studies have also identified teacher student's interaction as different systematically by sex Raynal. F (1999:9) expressed this situation as:

> *Teachers often ask boys more questions give them more time, more encouragement and more advice than girls. So that boys learn to express themselves better and to assert themselves and to question authority and the girls to be in habited in their interaction with teachers to take up less space physically and intellectually to be less highly valued.*

Practical experience should also affect the students' academic achievement of physics. If the teacher shows properly how to do a certain activity, the students can be motivated and interested in developing their skills, to do whatever task is given to them. According to Macnamara (1988:174), "practical experience can be used right through the training program,

but it is particularly useful towards the end. At that stage, all the elements which have been learned comes together enabling trainee to complete the whole skill." Similarly, to do practical activities in physics, teachers should guide the procedure and train students to use the whole skill to cover a topic. So, the teacher has to make the resources available to do practical activities, using the skill gained from practical experience of the teacher. Teaching physics effectively needs motivating students to do practical activities, using the skill gained from practical experience of the teacher. Therefore, teachers should not only focus on products, like principles, laws, theories, and others. Principles, laws, and theories will help students to know the product of their activities after passing through different scientific process. In practical actions, students should be able to discover the product of their activities. Martin (1997:57) suggested, "...It is better for children to learn to do science than to learn the facts, concepts, generalizations, theories". Therefore teachers should teach physics using care full and appropriate application of the scientific process. Teachers of physics should give more emphasis to practical activities.

- Peer groups

As children grow older, peers act as central agents of gender role socialization. Peers provide children with feedback about their behaviors. Research in the United States, Canada, and Australia indicates that children who behave in gender- appropriate ways are played with more frequently, are better liked, and are less likely to be teased than children who behave in gender- inappropriate ways (Hortup, 1983: 67). Peer may contribute to children's academic performance since they are one of the most potent influences on the day to day behaviors of children at school. Research on peer relation reveals that the quality of children relationship with their classmates is associated with school achievement (Bandura, Barbanelli, Caparara, and Posterlli, 1996; Wentzel, 1991; Went 1997) showed that children who were rejected by their peers had lower academic achievement scores than more popular children. Similarly, longitudinal evidence has shown that early peer rejection predicts decrease in academic performance, where as making a new friend in the classroom was associated with gains in school performance (Gvey et, al 1999: 241). Thus, it is possible to assume that children who

encounter problems with their peer relationship are likely to experience a school climate less conducive to learning than those who are well accepted by their class mates. Peers are more influential in situations involving friendship choices, challenges to authority, interpersonal behavior, and personal or group identity (Britain, 1963).

In line with this, Pergaman (2003:2439) writes:

> *Often peers indicating in groups reinforce these influential views by encouraging males and criticizing females. Groups learning experiences can further undermine the confidence of females in science if not carefully engineering. Teachers using group learning needs to help students learn how to respect the idea of others and avoid stereotyped responses such as "You are wrong, Girls cannot do science".*

- **Curriculum materials**

In most countries there is a national curriculum, which implies that boys and girls are exposed to the same subject. While this is true, schools in many countries continue to offer sex differentiated courses, particularly, with regard to practical activities. In African and Middle Eastern countries, girls continue to be placed in home economics but little access to technical and vocational education and boys in mechanical and retail course (El-Sanabary, 1989). In addition to this, Pergamon (2003:2439) states that:

> *Science courses could be modified to better serve the needs of all students. Such changes would be particularly beneficial for women. Studies of those who drop out of science programs reinforce the view that current courses discourage women, who dropout science is just as successful as those who remain. Women often leave science courses and careers not because of lack of success or poor grades but because of they feel undervalued and unwelcome in these courses and careers.*

Material inputs that are directly linked to the instruction processes consistently influence pupils' achievement. Many scholars hold that schools learning achievement is a function of the

material inputs expended per pupil and the efficiency with which these inputs are managed by the teachers and the head master (Fuller, 1986: 92). It is believed that quality teaching materials can help even inadequately trained teachers to improve their teaching skills and upgrade their own knowledge. As a result, there is no doubt that essential teaching material such as text books considerably affect school learning improvement. Regarding to this, Lock Heed and others (1991:46) show the key role of text books in the quality of education as follows: "...Because text books deliver the curriculum, they are the single most important instructional materials. Nothing has ever replaced the printed word as the key element in the educational process and, as a result, text books are central to schooling at all levels. When text books are available, instructional time is not wasted".

However, the analysis of sexual bias in text books (through mechanism such as stereotyping, rendering women invisible, and distorting reality) reveals remarkably similar findings across regions and cultural backgrounds. In developing countries, text books transmit heavily stereotyped images of men and women, with women adopting low profiles and having traits of passivity, dependence on men, low intelligence, and lacking in leadership (Pergamon, 2003).

- **School location**

Evidence from many developing countries suggest that parents are reluctant to send their daughters to distance schools because of the fear that they will be placed in moral and physical danger, thus necessitating different boarding and lodging arrangements costs for girls. Even in the relatively more open societies of Malaysia and Philippines, distance to school is a greater deterrent to girls' enrollment than to boys (King and Lillard, 1987). Geographical location of schools has an impact on the chances of going to school. Coombs (1985:228) reported that due to the location of schools students from rural areas are obliged to leave their parents from town where schools are located. This forced student to live in the absence of boarding facilities in rented house which may lead to low performance because of lack of parental help and control. Moreover, Pergamon (2003) asserted that distance from school acts as a considerable obstacle for girls whose parents feel that strict supervision of their daughters' behavior is needed. Distance is also problem for African girls at the high school level, as most of these

schools are located in urban area deeming it necessary for girls to live away from home in rented rooms.

On the other hand as it is stated by (Khan, 1993) in the Alemayehu, (2006:21)... school location specified as the distance to the nearest school is often used as a major school supply and thus of the cost of attendance. Distance to school implies expense from travel, board, and lodging. If these costs are prohibitive, parents may send their children to stay with relatives who live closer to the school, or they may simply give up. Among the most problematic factors for girls are cost of travel to school (in time or hazards). In general, a series of students have shown that the school location is found to be a barrier (deterrent to) and has considerable impact on academic achievement of girls.

2.4.3 Self related factors

There are several reasons for the low participation of females in science. Most of the reasons are associated in a certain way to perceptions that these subjects are "male domains" that females are less capable in those fields and that females don't need science and mathematics (Betz, 1997). These perceptions that reflect a gender bias toward science education exist among parents, teachers, peers etc (Eccles, 1997) the attitude and expectations of these people towards females' science education is the result of their perception that females are incapable of performing science and mathematics as male do. Self-perception of females about their capabilities in different subjects in turn is shaped by the attitude and expectations of other people around them. According to Scheefelben and Farrel (1982), the differential behavior of men and women within the educational system can be explained in terms of the self perception they have their ability. (Slaughter and Defoe, 1997: 42) also argued "the long term outcomes of schooling would be dependent on students' self perception both as a learner and as a person." Moreover, students' self –perception about their academic abilities and potential are especially influenced by what teachers, parents, and the society at large expect from them.

Attitudes of women based on their "self image" and the expectations of men about the "role and status of women" are seen as the "fundamental obstacles" to women equal participation in development (Synder Margaret and Mary Tadese; 1995:144) .They further indicated, "Those in

grown attitudes continuously reinforced the conservative mentality that women and girls shared in common. The result was a passive acceptance of the limitations of their traditional roles and hesitancy to the new fields". Kahle and his colleagues (1993:380) pointed out that "gender effect influences girls' attitudes towards science, their self-confidence in performing scientific tasks, their achievement levels in science, and their motivation to continue to study science." These and many other researchers (e.g. Keeves, 1973; Nevin, 1973; Kelly, 1978; Aiken, 1974) expounded that female students were handicapped by negative attitude towards physics. Thus, this condition could be manifested in poor physics performance. Most of the time female students believe that, since mathematics is a masculine subject and as this subject is the barrier of studying physical science.

Based on this idea Pergamon, 2003:2434) states that:

> *Mathematics itself seems to be relatively attractive to women: therefore the low rates of participation in the engineering and the physical sciences probably should not be attributing to the mathematical component of these fields. Many countries have moved from the presumption that women would never do anything in emerging female interest in traditionally masculine fields was blocked by formal barriers, to a situation in which at least nominally all fields are considered open to women.*

2.5 The Ethiopian context

Margery (1984:15) concluded that " once (they came) out of the primary school environment , females under achieve in a variety of subjects, especially in physical sciences, engineering and technology related subjects". In Ethiopia, the same situation prevails. The majority of female students tend to go to social sciences while in natural science fields their rate of participation is very low as compared to their male counter parts. Thus underrepresentation of female students in science fields begins at the secondary school level. The gender gap in academic performance is wider, for instance, in grade 8 boys achieved mean score and 3.3.% to 4.5% in five subjects (English , Mathematics, Biology, Chemistry and Physics) , particularly 3.3% in

Physics than girls (GEQAEA, 2008). In grade 10 boys achieved mean scores that were higher by 6.56% in the average score and 4.35% to 8.92% in five subjects (English , Mathematics, Biology, chemistry and physics), particularly, 4.35% in physics than girls. In grade 12 boys achieved mean scores that were higher by 6.6% in the average score and 2.4% to 8.6% in the five subjects (English , Mathematics, Biology, Chemistry and Physics), particularly 5.8% in physics than girls (GEQAEA, 1210).

CHPTER THREE

3. RESEARCH DESIGN AND METHODOLOGY

3.1 Research Design

A research design is a plan, structure and strategy of investigation so conceived as to obtain answer to research question or problems. It is a procedural plan that is adopted by the research to answer questions validly, objectively, accurately and economically.

A research design has two main functions. The first relates to the identification and/or development of procedures and logistical arrangements required to undertake a study, and the second emphasis the importance of quality in these procedures to ensure their validity, objectivity and accuracy (Kumar, 1999).

The aim of this study was to examine factors affecting the academic performance of female students in physics. To secure the required information both qualitative and quantitative approach were used.

3.2 Sources of Data

The sources of data were the natural science stream female students, department heads of physics, and school principals in the three selected preparatory schools of Awi zone.

3.3 Population, Sample and Sampling Techniques

The researcher has chosen Awi zone as his area of study because he is familiar with the area and also has been working in the area for many years. Due to this, he believed that, as he can get the information easily for his research. In this Administrative zone there are 7 woredas, 3 Administrative city and five preparatory schools. For a sampling design to be called random/probability sample, each element in the population must have an equal and independent chance of selection in the sample. Equal implies that the probability selection of each element in the population is the same, that is, the choice of an element in the sample is not influenced by other conditions such as personal preferences, (Kumar, 1999). Accordingly,

CHAPTER FOUR

4 PRESERNTATION, INTERPRETATION AND ANALYSIS OF DATA

4. 1 Introduction

This chapter analysis and interprets data collected from the respondents (department heads, school principals and female students), and documents. The instruments used to collect data for the study were questionnaire, interview and documents (two year rosters). The analysis of the whole study was made as follows: - Regarding the questionnaire, it was analyzed by using table for each factor stated in the questionnaires. The frequency of the respondents of students in every school is indicated on (appendix B).

In the tables indicated in this chapter the percentage of the frequencies and mean values for all factors were calculated. The values and ranges used in the tables presented based on the rule stated by Gay and Airasian (2000: 156). These authors noted on likert scale the following values for negative statements: - "strongly agree (SA) = 1, Agree (A) = 2, Uncertain (U) = 3, Disagree (D) = 4, and strongly disagree (SD) =5". Based on the value given for rating scale, the average of the rating scales is 3. From this average of the rating scale (3) it is possible to say, the respondents agree if the average value is less than three and disagree if the average value is greater than three with the issue. But this doesn't clearly indicate whether the respondents were strongly agree, agree, uncertain, disagree and strongly disagree on the issue. To make the interpretation more specific and to indicate whether the mean shows strongly agree, agree, uncertain, disagree and strongly disagree, it seems logical to interpret the result as follows. If the mean fails below 1.49 then it scores strongly agree, between 1.5 and 2.49,it scores agree, between 2.5 & 3.49 it scores uncertain, between 3.5& 4.49, it scores disagree and between 4.5 and 5, it scores strongly disagree. Concerning the interview, the response of the school administrators and the department heads of physics were quoted to strengthen the response of the female students and analyzed qualitatively depending on the suggested factors. So, the two years roster average results of physics is statistically using t-test analyzed to see the status of female students' academic performance with relation to their counter parts of male students.

4.2 Respondents' background information

4.2.1 Female students' background information

Table 1 female students' background information

	Age					Marital status				Residence			grade level
	16-20	21-25	26-30	above 30	total	single	married	separated	total	town	rural	total	
f	103	12	8	2	125	94	14	17	125	33	92	125	11
%	82.4	9.6	6.4	1.6	100	75.2	11.2	13.6	100	26.4	73.6	100	
f	80	9	7	2	98	73	11	14	98	26	72	98	12
%	81.6	9.2	7.2	2.0	100	74.5	11.2	14.3	100	26.5	73.5	100	

As can be seen from table 1, most of respondents were living in the rural areas. Being the family of rural area has its own impact on students' performance and attitude towards natural sciences. In line with this, Odaga and Heneveld (1995:18) state "in most of secondary education level of Ethiopia especially in rural areas female students' academic choice is committed to specific area. It is true that girls tend to enroll in education and art subjects and to be underrepresented in science subjects and mathematics where boys and men dominate". As the age of female students increased their performance in science fields goes on decreased. In line with this, Jacobson and Doran (1985:142) say "the gap also varies with age, getting larger as students become older. The gender gap in science achievement is smaller in the United States than in other countries, but still larger in physical science and among 17-year old students".

4.2.2 Department heads and principals background information

From a total of 6 department heads and school principals with the service years of 1-5 and 6-10 are 16.7%, and with the service years of 11-15 and above 15 are 33.3%. All of them are also

with a natural science stream qualification. Therefore, they can give more information about the issue because they are familiar with the field and have more experience.

4.3 Home related factors

Table 2 Female students' perception on home related factors

Item		Strongly agree (S.A= 1)	Agree (A=2)	uncertain (U=3)	Disagree (D.A=4)	Strongly disagree (S.D=5)	$\mu = \sum xf/N$
4.1.1 Lack of parental financial support	f	115	58	7	24	19	2.0
	%	51.6	26.0	3.1	10.8	8.5	
4.1.2. Lack of parental moral support	f	86	69	5	33	30	2.3
	%	38.6	30.9	2.2	14.8	13.5	
4.1.3. Father's poor educational background	f	108	68	12	13	22	1.9
	%	48.4	30.5	5.4	5.8	9.9	

As can be seen from table 2 which says "lack of parental financial support", the result indicate 51.6%; 26.0%; "strongly agree" and "agree" respectively. Nearly 10.8%; 8.5%; of the respondents "disagree" and "strongly disagree" respectively. The remaining 3.1% rated "uncertain". The mean value 2.0 indicates the female students agree to the issue. Similar to this analysis, Shultz (1993:216) says "socioeconomic status appears to be affecting achievement motivation desire which in turn affects academic performance".

Therefore, from the result of respondents' response and literature, we can conclude that the lack of parental financial support affects negatively the academic performance of female students in physics.

When asked if "lack of parental moral support", the result of table 2 indicate that, 38.6%; 30.9%; "strongly agree" and "agree" respectively. Nearly 14.8%; 13.5%; of the respondents "disagree" and "strongly disagree" respectively. The remaining 2.2% rated "uncertain". The mean value 2.3 indicates that the respondents agree to the issue. In line with this, T1 (interviewee) says "most of the parents perceive that, physics is a hard subject that is unable for female students rather it is a subject of males'. Due to such and other reasons, parents do not motivate and give any moral support for female students in any activities of physics" (January 20, 2011). Besides, Hyde (1993:49) says "the cultural factors that arise from gender specific beliefs and biases in a society do not allow females to aspire careers that all perceived as male domain due to being afraid of disapproval from others".

Therefore, from the above given response, suggestion of respondents and literature, one can understand that as there is no parental support for female students. So, lack of parental moral support has its own negative effect on the academic performance of female students in physics.

Concerning "father's poor educational background" the result of table 2 indicate that, 48.4%; 30.5%; "strongly agree" and "agree" respectively. Nearly 5.8%; 9.9%; of the respondents "disagree" and "strongly disagree" respectively. The rest 5.4% rated "uncertain". The mean value 1.9 indicates that the female students agree to the issue. Similar to this analysis, Kelly and Elliot (1991: 92) say "the strength and form vary; the impact of father's schooling on girls' education is wide spread. In many social background categories females' advantage is found to be more substantial than do sons' only when fathers' schooling is relatively high".

Therefore, form the above response and study of researchers' one can conclude that father's poor educational background has its own negative effect on the academic performance of female students in physics.

Table 3 female students' perception on home related factors (continued)

Item		Strongly agree (S.A= 1)	Agree (A=2)	uncertain (U=3)	Disagree (D.A=4)	Strongly disagree (S.D =5)	$\mu = \sum xf/N$
4.1.4. Mother's poor educational background	f	112	70	9	12	20	1.9
	%	50.2	31.4	4.0	5.4	9.0	
4.1.5. mother's lower occupational status	f	107	64	13	18	21	2.0
	%	48.0	28.70	5.83	8.07	9.4	
4.1.6. Father's lower occupational status	f	95	88	7	18	15	2.0
	%	42.6	39.5	3.1	8.1	6.7	

When asked if "mother's poor educational background", the result of table 3 indicate that, 50.2%; 31.4%; "strongly agree" and "agree" respectively. Nearly 5.4%; 9.0%; of the respondents "disagree" and "strongly disagree" respectively. The remaining 4.0% rated "uncertain". The mean value 1.9 indicates that the respondents agree to the mother's poor educational background. In line with this, Pergamon (2003:2415) sates the effect of mother's poor education on females' academic performance as "after controlling for various other factors such as parent's occupation and wealth and school characteristics, the mother's and father's education levels were found to have different effects on children's schooling".

Therefore, form the above respondents' response and literature; we can understand that mother's poor educational background has its own negative effect on female students' academic performance.

Regard to "mother's lower occupational status", the result of table 3 indicates that, 48.0%; 28.7%; "strongly agree" and "agree" respectively. Nearly 8.1%; 9.4%; of the respondents

"disagree" and "strongly disagree" respectively. The rest 5.8% rated "uncertain". The mean value 2.0 indicates that the respondents agree to the issue.

Similar to this analysis, Pergamon (2003:2419) states"...It is also clear that women's participation in education (both in terms of enrollment and time spent in education) is determined by the economic situation of the family to a greater extent than is that of men". And concerning "father's lower occupational status", the result of table 3 indicate that, 42.6%; 39.5%; "strongly agree" and "agree" respectively. Nearly 8.1%; 6.7%; of the respondents "disagree" and "strongly disagree" respectively. The remaining 3.1% rated "uncertain". The mean value 2.0 indicates that the respondents agree to father's lower occupational status. Besides, Jacques (1987:231) Explained "Students were engaged in part- time employment to cover school fees and to fulfill other materials". On his study the effect of part time employment on academic achievement of high school students, he reported that the non-employed students, grade point averages were higher than the grade point of the employed students.

From the above suggestions and literature, one can conclude about the mother's and the father's lower occupational status affects negatively female students' academic performance.

Table 4 female students' perception on home related factors (continued)

Item		Strongly agree (S.A= 1)	Agree (A=2)	uncertain (U=3)	Disagree (D.A=4)	Strongly disagree (S.D =5)	$\mu = \sum xf/N$
4.1.7. Parental perception of physics is as a masculine subject	f	110	62	4	22	25	2.1
	%	49.3	27.8	1.8	9.9	11.2	
4.1.8. Parents' low expectation about females' academic performance of physics.	f	107	66	10	17	23	2.0
	%	48	29.6	4.5	7.6	10.3	
4.1.9. making female students family responsibility (child care)	f	105	61	12	22	23	2.1
	%	47.1	27.4	5.4	9.9	10.3	

Regard to "parental perception of physics is as a masculine subject" of table 4 shows that, 49.3%; 27.8%; "strongly agree" and "agree" respectively. Nearly 9.9%; 11.2%; of the respondents "disagree" and "strongly disagree" respectively. The rest 1.8% rated "uncertain". The mean value 2.1 indicates that the respondents agree to the issue. Like this, T3 (interviewee) says "most of the patents perceive that physics is a hard subject area that is not easy for female students. Due to this, they did not motivate their daughters to continue in the field of physics" (December 29, 2010).

Therefore, form the above response and suggestion; we can conclude that parental perception of physics is as a masculine subject has its own negative impact on the academic performance of female students in physics.

When asked if parents' low expectation about females' academic performance of physics, the result in table 4 indicates that, 48.0%; 29.6%; "strongly agree" and "agree" respectively. Nearly 7.6%; 10.3%; of the respondents "disagree" and "strongly disagree" respectively. The remaining 4.5% of them rated "uncertain". The mean value 2.0 shows that the respondents agree to the issue. Similarly, P1 (interviewee) says

> *Parents especially, educated parents considered that physics is hard subject and having this idea, all female students are unable to continue in this field, even they ignore that of outstanding female students. So, generally they expect that female students' academic performance of physics is too poor. Due to this female students are not initiated to join natural science particularly physics* (January 19, 2011).

Supporting this, Rubbo Anna (1975:339) says "parents generally, encourage their daughters to be "docile" and "compliant" so that they will be able to play the role they are expected to play as wife and mother in their future life".

Therefore, from the response and suggestion given above one can conclude that parents' low expectation about females' academic performance of physics has its own negative effect on their academic performance.

Regard to "making female students family responsibility (child care)", the result of table 4 indicate that 47.1%; 27.4%; "strongly agree" and "agree" respectively. Others 9.9%; 10.3%; "disagree", and "strongly disagree" respectively. The rest 5.4% of the respondents rated "uncertain". The mean value 2.1 shows that the respondents agree to the issue. In line with this, Jacqueline (1970: 87) says "the expected familial roles and responsibilities of girls' are those duties that bind them to the domestic sphere, such as child care, food preparation and other time consuming activates including, the fetching of water, cleaning and agriculture work. Contrary to girls, boys are encouraged to develop some degree of autonomy and independence from the family".

Therefore, form the responses of respondents and the literature; one can understand that making female students family responsibility is a common problem, so it has its negative impact on female students' academic performance in physics.

4.4 school related factors

Table 5 Female students' perception on school related factors

Item		Strongly agree (S.A= 1)	Agree (A=2)	uncertain (U=3)	Disagree (D.A=4)	Strongly disagree (S.D =5)	$\mu = \sum xf/N$
4.2.1 Lack of physics text books	f	104	81	2	14	22	2.0
	%	46.6	36.3	0.9	6.3	9.7	
4.2.2 lack of physics reference books	f	21	31	10	72	89	3.8
	%	9.4	13.9	4.5	32.3	39.9	
4.2.3 Forcing female students to join the natural science stream without their choice but for the sake of fulfilling 70% towards science	f	90	67	7	23	36	2.3
	%	40.4	30.0	3.1	10.3	16.1	

When asked if "lack of physics text books" the result from table 5 indicates that 46.6%; 36.3%; "strongly agree" and "agree" respectively. Nearly 6.3%; 9.7%; of the respondents "disagree" and "strongly disagree" respectively. The rest 0.9% rated "uncertain". The mean value 2.0 shows that the respondents agree to the issue. Similarly, T1 (interviewee) says

> *In this year, due to the change of curriculum still the students are without text books. As you know teaching without text books and teachers guide is too difficult. So teachers are in a problem to give class work, homework and generally to give any activities of physics for the students. The students also become unable to do any activities particularly female students, because most of female students are not experienced to use library to refer* (January 20, 2011).

Besides, Lock Heed and others (1991:46) say "because text books deliver the curriculum, they are the single most important institutional materials. Nothing has ever replaced the printed word as the key element in the educational process and, as a result, text books are control to schooling at all levels. When text books are available, instructional time is not wasted".

So from the above responses, suggestions and literature; we can conclude that lack of physics text book has negative effect on students' performance particularly on female students.

Regard to lack of physics reference books, of table 5 indicates that 9.4%; 13.9%; "strongly agree" and "agree" respectively. Others 32.3%; 39.9%; of the respondents "disagree" and "strongly disagree" respectively. The remaining 4.5% rated "uncertain". The mean value 3.8 indicates that the respondents disagree to the issue. Similar to this analysis, p1 (interviewee) says "in our library there are enough reference books in different subject areas. In physics also the reference books are available, but most of female students are not seen while they are using the library" (January 19, 2011).

Therefore, from this, one can conclude that, even if the reference books are available the female students are not seen using it properly. So only the availability of the reference books is not sufficient for the academic performance of female students in physics.

Concerning to " forcing female students to join the natural science stream without their choice but for the sake of fulfilling 70% towards science", the result from table 5 indicate 40.4%; 30.0%; "strongly agree" and "agree" respectively. Nearly 10.3%; 16.1%; of the respondents "disagree" and "strongly disagree" respectively. The rest 3.1% of them rated "uncertain". The mean value 2.3 shows that their agreement with the issue. Similarly, P3 (interviewees) says "as you know, this strategy is government's focusing issue; primarily, we give an opportunity for any students to join their choice of stream but most of female students due to different reasons tend to choose social science stream. Since, the strategy is government's current issue, due to this we forced them to join natural science stream without their choice" (December 27, 2010).

From the above responses and suggestions we can understand as female students are forced to join the natural science stream, forcing them without their need can influence negatively the female students' academic performance of physics.

Table 6 female students' perception on school related factors (continued)

Item		Strongly agree (S.A= 1)	Agree (A=2)	uncertain (U=3)	Disagree (D.A=4)	Strongly disagree (S.D =5)	$\mu = \sum xf/N$
4.2.4 lack of Library services		18	26	14	78	87	3.9
	%	8.1	11.7	6.3	35.0	39.0	
4.2.5. Lack of laboratory service	f	108	91	7	8	9	1.7
	%	48.4	40.8	3.1	3.6	4.0	
4.2.6 School distance from student's home	f	83	84	11	28	17	2.2
	%	37.2	37.7	4.9	12.6	7.6	
4.2.7 Irrelevant of physics curriculum to female students need.	f	28	33	25	56	81	3.6
	%	12.6	14.8	11.2	25.1	36.4	

From table 6 given above regarding item No 4.2.4, the result shows 8.1%, 11.7%; "strongly agree" and "agree" respectively. In other words 35.0%; 39.0%; of the respondents "disagree" and "strongly disagree" respectively. The remaining 6.3% of them rated "uncertain". The mean value 3.9 indicates that the respondents agree to the issue. In line with this, p1 (interviewee) says "in our school, we are giving the Library service properly, even overtime services. But the only problem is that students themselves are not willing to use the Library particularly female students" (January 19, 2011).

Therefore, from the above response and suggestions given, one can understand that as there is no lack of library services. But students are not using the library. So the negative effect of academic performance is not due to the lack of library services rather than using properly.

As can be seen from the table 6, which says "Lack of laboratory services", the result indicate that 48.4%; 40.8%; "strongly agree" and "agree" respectively. Nearly 3.6%; 4.0%; of the respondents "disagree" and "strongly disagree" respectively. The rest 3.1% rated "uncertain". The mean value 1.7 indicates the agreement of the respondents with the issue. In line with this, T3 (interviewee) says "most of the teachers did not use laboratory because; they perceive that as the plasma will replace the laboratory services" (December 29, 2010).

Unlike to this, Martin (1997:57) suggest "...it is better for children to learn to do science than to learn the facts, concepts, generalizations and theories. Therefore, teachers should teach physics using careful and appropriate application of the scientific procedures".

Therefore, from this one can understand that as there is a misunderstanding of teachers about the purpose of plasma television and laboratory services. So such problem has its own negative effect on the academic performance of female students in physics.

Regarding "school distance from student's home", the result of table 6 indicate that 37.2%; 37.7%; "strongly agree" and "agree" respectively. Nearly 12.6%; 7.6%; of the respondents "disagree" and "strongly disagree". The rest 4.9% rated "uncertain". The mean value 2.2 indicates that the respondents agree to the issue. Similar to this analysis, Coombs (1985:228) says "due to the location of schools, students from rural areas are obliged to leave their parents

from town where schools are located. This forced students to live in the absence of boarding facilities in rented house which may lead to low performance because of lack of parental help and control".

Therefore, from the response of female students we can understand that the school distance from student's home is the problem for most of female students and this problem is asserted by a researcher. So, school distance from student's home has a negative effect on females' academic performance in physics.

Regard to "Irrelevant of physics curriculum to female students need", the result of table 6 indicate that, 12.6%; 14.8%; "strongly agree" and "agree" respectively. Likewise 25.1%; 36.4%; of the respondents "disagree" and "strongly disagree" respectively. The remaining 11.2% of them rated "uncertain". The mean value 3.6 indicates that the respondents agree to the issue.

In other words, Pergamon (2003:2439) says "women often leave science courses and careers not because of lack of success or poor grades but because of the feel undervalued and unwell come in these courses and careers".

Therefore, from the above response of respondents, we can understand female students disagree with the issue. But from the researcher's idea, we can understand that science course could be modified to better serve the needs of all students, particularly beneficial to women.

Table 7 Female students' perception on school related factors (continued)

Item		Strongly agree (S.A= 1)	Agree (A=2)	uncertain (U=3)	Disagree (D.A=4)	Strongly disagree (S.D =5)	$\mu=\sum xf/N$
4.2.8 Not creating conditions conducive to do practical activates for females.	f	92	74	12	20	25	2.2
	%	41.3	33.2	5.4	9.0	11.2	
4.2.9 Lack of motivation female students to do exercise in the class	f	97	80	10	25	11	2.0
	%	43.5	35.9	4.5	11.2	4.9	
4.2.10 Physics teachers do not motivate (initiate) female students to do home work.	f	84	69	12	32	26	2.3
	%	37.7	30.9	5.4	14.4	11.7	

As we observed from table 7, the responses obtained from female students, regarding "not creating conditions conducive to do practical activates for females," the result indicates; 41.3%; 33.2%; "strongly agree" and "agree" respectively. Nearly 9%; 11.2%; of the respondents "disagree" and "strongly disagree" respectively. The rest 5.3% rated "uncertain". The mean value 2.2 indicates that the respondents agree to the issue. Similarly, T3 (interviewee) says "most of physics teachers used lecture method to teach the students only by following the top up students rather than creating conditions conducive to do practical activities for females"(December 29, 2010)

Unlike to this, Avados and Haddad (1981:172) say "teachers attitude and skills that have bearings on school effectiveness include: academic and intellectual profession, internal motivation for teaching, teachers' high expectation for student performance, knowledge of subject matter, teacher's beliefs about the purpose and utility of schooling etc".

So, the responses and the suggestion given by the teacher indicate that, teachers not creating conditions conducive to do practical activities for female therefore, lack of creating conditions conducive to do practical activities for females in doing different tasks (solving problems, participating in practical activities) of the subject physics affect the academic performance of female students.

Regard to "lack of motivation female students to do exercise in the class," the result indicates, 43.5%; 35.9%; "strongly agree" and "agree" respectively. Nearly 11.2%; 4.9%; of the respondents "disagree" and "strongly disagree" respectively. The remaining 4.5% rated "uncertain" (table7). The mean value 2.0 also indicates that the respondents agree to the issue. In line with this, Pergamon (2003:2435) says "the barriers to girls' education begin earlier at primary school level where, teachers and text books may project attitudes that discourage achievement by girls or promote stereotypes of girls less able than boys at learning technical subjects".

Therefore, lack of motivation female students to do exercise in the class affect negatively the academic performance of female students in physics.

When asked if "physics teachers don't motivate (initiate) female students to do homework", the result of respondents in table 7 indicates. 37.7%; "strongly agree" and 30.9% "agree". And 14.4%; 11.7% "disagree" and "strongly disagree" respectively. The rest 5.4% of the respondents rated "uncertain". The mean value 2.3 shows that the respondents agree to the issue. Besides, P3 (interviewee) says "most of physics teachers are not committed to help female students by giving exercises, setting tutorial programs, checking their homework and giving feedback to female students. Even we principals are not committed to follow up any activities of females because of other extra burdens in the school" (December 27,2010). Supporting this, Tobin et.al (1990:132) says "much research indicated that teachers are more likely to ask males rather than females to answer complex questions to give feedback to males, but negative feedback to females".

Therefore, lack of physics teachers to motivate female students to do their homework has its own impact on female students' academic performance of physics.

Table 8 Female students' perception on school related factors (continued)

Item		Strongly agree (S.A= 1)	Agree (A=2)	uncertain (U=3)	Disagree (D.A=4)	Strongly disagree (S.D =5)	$\mu=\sum xf/N$
4.2.11 lack of teachers support for female students	f	70	80	9	37	27	2.4
	%	31.4	35.9	4.0	16.6	12.1	
4.2.12 Teachers ineffective instructional method in physics	f	26	26	23	71	77	3.7
	%	11.7	11.7	10.3	31.8	34.6	
4.2.13 Teachers low expectation of females' ability of getting good grades in physics.	F	94	79	11	27	12	2.0
	%	42.2	35.4	4.9	12.1	5.4	

With regard to lack of teachers support for female students, in table 8 shows that 35.4%, 35.9%. "Strongly agree" and "agree" respectively. Nearly 16.6%, 12.1%; of the respondents "disagree" and "strongly disagree" respectively. The rest 4.0% of them rated "uncertain". The mean value 2.4 indicates that the respondents agree to the issue. Similarly, T2 (interviewee) says "most of physics teachers perceive that as female students are poor at physics. By considering this, teachers concluded as female students couldn't score a good grade in physics. So they do not support female students in every activity of physics" (January 6, 2011).

From the result of the response of the students and the suggestion given by the teacher, it is possible to conclude that, lack of teacher support for female students affected negatively the academic performance of female students in physics.

Concerning "teachers' ineffective instructional method in Physics", the result indicates 11.7%; 11.7% "strongly agree" and "agree" respectively. Nearly 31.8%; 34.6%; of the respondents "disagree" and "strongly disagree" respectively. The rest 10.3% rated "uncertain" .The mean value 3.7 indicates that the respondents disagree to the issue. In other words, P1 (interviewee)

says "there are many teachers that can affect female students' academic performance in physics, among which the main one is teachers' poor method of instruction, though physics is most of the time a practical activity, but most of the physics teachers teach with a lecture method and they could not design any alternative way of teaching for female students" (January 19, 2011). Supporting this, T3 (interviewee) sates as; "most of the time physics teachers teach students with only lecture method rather than using student centered method, because of this, female students are not given special attention with instructional method of physics"(December 29, 2010).

From the above response of students and suggestions of teacher & principal, one can conclude that as there is a gap between them about the issue.

When asked if "teachers low expectation of females' ability of getting good grades in physics", the result in table 8 indicates that 42.2%; 35.4% "strongly agree" and "agree", respectively. Nearly 12.1%; 5.4%; of the respondents "disagree" and "strongly disagree". The rest 4.9% of them rated "uncertain". The mean value 2.0 tells us that the respondents agree to the issue.

In line with this, Raynal F (1990:9) states "teachers often ask boys more questions give them more time, more encouragement and more advice than girls. So that boys learn to express themselves better and to assert themselves and to question authority and the girls to be in habited in their interaction with teachers to take up less space physically and intellectually to be less highly valid".

So, from the above response of students and the literature we can conclude that teachers low expectation of females' ability of getting good grades in physics discourage their academic performance of physics.

4.5 Self related factors

Table 9 Female students' perception on self related factors

Item		Strongly agree (S.A= 1)	Agree (A=2)	uncert ain (U=3)	Disagree (D.A=4)	Strongly disagree (S.D =5)	$\mu = \sum xf/N$
4.3.1 Perception of the subject physics as being too difficult.	f	120	69	7	15	12	1.8
	%	53.8	30.9	3.1	6.7	5.4	
4.3.2. Lack of confidence due to students educational back ground in physics.	f	115	70	11	15	12	1.8
	%	51.6	31.4	4.9	6.7	5.4	
4.3.3. Lack of interest to learn physics	f	78	75	6	33	31	2.4
	%	35.0	33.6	2.7	14.8	15.9	

As can be seen from table 9, "Perception of the subject physics as being too difficult" the result of the table indicate that, 53.8%; 30.9%; "strongly agree" and "agree" respectively. Others 6.7%; 5.4%; of the respondents "disagree" and "strongly disagree" respectively. The rest 3.1% rated "uncertain". The mean value 1.8 indicates that the respondents agree to the issue. Similar to this analysis, P2 (interviewee) responses "most of female students perceive that as physics is difficult subject for them due to this, they concluded that as physics is a male subject" (January 7, 2011). Besides, Kahle and his colleagues (1993:380) say "gender effect influences girls' attitudes towards science, their self-confidence in performing scientific tasks, their achievement levels in science, and their motivation to continue to study science".

Therefore, from the response of students, the suggestion of principals and many researchers, one can conclude that the female students' perception of the subject physics as being too difficult has negative effect on the academic performance of themselves in physics.

When asked if "lack of confidence due to students' educational background in physics", the result of table 9 indicate that, 51.6%; 31.4%; "strongly agree" and "agree" responsively. Nearly 6.7%; 5.4%; of the respondents "disagree" and "strongly disagree" respectively. The rest 4.9% rated "uncertain". The mean value 1.8 indicates that the respondents agree to the issue. In line with this, T1 (interviewee) responds "most of female students are not with good background in physics, for instance there was a lesson about motion in their grades 7, 9 &10 but when we asked the concept of motion at their grade 11, and they couldn't recall it. Hence female students are too poor in their educational background in physics" (January 20, 2011). Moreover, P2 added that "the lack of basic background knowledge of students, shortage of time and absence of opportunities for independent activities are factors that contribute to the lack of confidence to perform well in physics" (January 6, 2011). Based on the above response of students and suggestions of teachers we can conclude that lack of confidence due to female students' educational background in physics affected negatively their academic performance in physics.

The other factor "Lack of interest to learn physics" the result of table 9 indicate that, 35%; 33.6%; "strongly agree" and "agree" respectively. Nearly 14.8%; 13.9%; of the respondents "disagree" and "strongly disagree" respectively. The remaining 2.7% rated "uncertain". The mean value 2.4 indicates that the respondents agree to the lack of interest to learn physics. Similarly T3 (interviewee), added on this issue that "due to many factors, such as lack of teachers support, their negative perceptions to physics, lack of participation in any activities of physics etc female students are not interested to learn physics"(December 29,2010). Besides, T1 (interviewee) says

> Students lose interest due to so many reasons. To mention some from my long experience, one reason could be economical background of the students to fulfill their need like reference materials, uniform, shortage of time to do any activities of physics because of female students are mostly devote their time by helping the family, on the other hand, female students see their elders sitting at home after completing secondary school by such and such reasons

female students are not interested in learning physics (January 20, 2011).

Therefore, from the suggestions of teachers and the responses of female respondents, we can understand that lack of interest to learn physics influences negatively the academic performance of female students in physics.

Table 10 Female students' perception on self related factors (continued)

Item		Strongly agree (S.A= 1)	Agree (A=2)	uncertain (U=3)	Disagree (D.A=4)	Strongly disagree (S.D =5)	μ= ∑xf/N
4.3.4 Shortage of time after class to do practical activities	f	90	81	7	25	20	2.1
	%	40.4	36.3	3.1	11.2	9.0	
4.3.5 Lack of participation in doing group works	f	94	75	10	23	21	2.1
	%	42.2	33.6	4.5	10.3	9.4	
4.3.6 shortage of mathematics knowledge	f	94	66	9	33	21	2.2
	%	42.2	29.6	4.0	14.8	9.4	
4.3.7 peer group influence		86	71	12	32	22	2.3
		38.6	31.8	5.4	14.4	9.9	

When asked if, regard to "shortage of time after class to do practical activities," (table 10) the result indicate that 40.4%; 36.3%; "strongly agree" and "agree" respectively. Others 11.2%; 9%; of the respondents "disagree" and "strongly disagree" respectively. The remaining 3.1% rated "uncertain". The mean value 2.1 indicates that the respondents agree to the issue. Similarly, Mensch (1998:16) states "girls' home are not just residential bases they are also the loci of power full forces that shape every aspect of girls' existence, including their time use, access to school, and paid work and social status". Besides, T2 (interviewee) says "most of female students could not come to school while we call them for tutorial, to do practical activates of physics in their opposite shift, from this I can understand that female students are always busy in helping their family in every activities of home" (January 7,2011).

Form the above responses of female students, the literature, and suggestion of a teacher, one can conclude that shortage of time after class to do practical activities has its own negative impact in the academic performance of female students in physics.

When asked if "lack of participation in doing group works", the result of table 10 shows 42.2%; 33.6%; "strongly agree" and "agree" respectively. Nearly 10.3%; 9.4%; of the respondents "disagree" and "strongly disagree" respectively. The rest 4.5% of them rated "uncertain". The mean value 2.1 indicates that the respondents to the issue. Similar to this analysis, T3 (interviewee) says

> *When we give a group work for the students by grouping them with certain number of members in a group and asked them to do one by one in the class. During this time, most of female students are unable to do the given task. From this, I can understand that most of female students were not participate in a group. Simply they want to score a good grade rather than improving their knowledge. As I can understand, there are many reasons such as female students perceive physics is a masculine subject, they couldn't get enough time to participate with in a group, parents are not willing to their daughters to go to school in opposite shift* (December 29,2010)

Besides, Synder Margaret and Mary Tadess (1995:144) say "attitudes of women based on their "self image" and the expectations of men about the "role and status of women" are seen as the "fundamental obstacles" to women equal participation in development. Those in grown attitude continuously reinforced the conservation mentality that women and girls shared in common. The result was a passive acceptance of the limitations of their traditional roles and hesitancy to the new fields".

Therefore, form the above response and suggestions, one can conclude that female student's lack of participation in doing group works has its negative influence on their academic performance in physics.

Regard to "shortage of mathematics knowledge", the result of table 10 indicate that 42.2%; 24.6%; "strongly agree" and "agree" respectively. Others 14.8%; 9.4%; of the respondents "disagree" and "strongly disagree" respectively. The remaining 4% of them rated "uncertain".

The mean value 2.2 indicates that the respondents agree to the issue. In line with this, T1 (interviewee) supported as:

> *As one knows without knowledge of mathematics, it is impossible to do any activities of physics and in the text of grade 9 physics "mathematics is the toll of physics". But, most of female students are poor in mathematics due to this; they couldn't interpret the concept of physics in to mathematical analytic. I also observed that, most of female students scores less grades in their exam of workout part* (January 20, 2011)

Therefore, from response of respondents, and the suggestions of the teacher mathematics is a tool for physics.

When asked if "peer group influence", the result of table 10, indicate that 38.6%; 31.8%; "strongly agree" and "agree" respectively. Nearly 14.4%; 9.9%; of the respondents "disagree" and "strongly disagree" respectively. The rest 5.4% rated "uncertain". The mean value 2.3 shows that the respondents agree to the issue. In line with this, P3 (interviewee) says "since physics is believed as a hard subject and female students couldn't continue further in this subject. So, most of female students are influenced by the peer groups. Due to this, female students are not interested to join to natural science stream" (December27, 2010). Similarly, P1(interviewee) says, "most of the time female students are pre-informed that physics is a difficult subject to join, due to this they do not have any interest or attitude towards physics (January 6, 2011)

So, form the above respondents' response and suggestion one can generalize that, peer groups influence can affect negatively the academic performance of female students in physics.

CHAPTER FIVE

5. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Summary and findings

The main focus of the study was to investigate factors affecting the academic performance of female students in physics in Awi zone preparatory schools and the status of female students' academic performance compared to male students in physics in the zone's preparatory schools. In order to get the relevant data, three data gathering instruments were used. These were: questionnaire, interview and document. The sources of the data were natural science stream female students, physics department heads, school principals and the past two years (2009&2010) rosters of Awi zone preparatory schools. To secure the required information both qualitative and quantitative approach were used. Among the total population of 743, (30%) of natural science stream female students, which were 223 filled the questionnaire properly. Three physics department heads and three school principals were interviewed. Beside to this, 2009 and 2010 years grade 11& 12 average physics rosters were analyzed. This study has revealed factors related to home, school and self for the academic performance of female students in physics. Finally data was analyzed using percentage and mean value for the questionnaire, narrative approach for interview and statistical tools such as t-test for document. In line with the basic questions: the main outcomes of the study are stated briefly below:-

5.1.1 Home related factors

The academic performance of female students in physics can be largely affected by parental problems, such as socio-economic, perception, attitude, etc on female students' academic performance in physics. Some of the points revealed by the study are:

- Lack of parental financial support.
- Lack of parental moral support.
- Father's poor educational background.
- Mather's poor educational background.
- Mather's lower occupational status.

- Father's lower occupational status.
- Parental perception of physics is as a masculine subject.
- Parent's low expectation about females' academic performance of physics.
- Making female students family responsibility (childcare)

5.1.2 School related factors

The school itself is also one of the main affecting factors for the academic performance of female students in physics. The school has an obligation to fulfill any input for female students to make them equal with their male counter parts in the academic performance of physics. Under this, the following are some points in which the study gave great attention.

- Lack of physics text books.
- Lack of physics reference books.
- Forcing female students to join the natural science stream without their choice but for the sake of fulfilling 70% towards natural science.
- Lack of library services.
- Lack of laboratory services.
- School distance from student's home.
- Irrelevant of physics curriculum to the female students need.
- Teachers not creating conditions conducive to do practical activities for females.
- Teachers lack of motivation female students to do exercises in the class.
- Teachers do not motivate (initiate) female students to do homework.
- Lack of teachers support for female students.
- Teachers' ineffective instructional method in physics.
- Teachers low expectation of females' ability of getting good grades in physics.

5.1.3 Self related factors

The academic performance of female students in physics can also be affected by different activities of themselves the study indicates some of the problems of the academic performance of female students related to them, as follows:

- Perception of the subject physics as being too difficult.
- Lack of confidence due to female students' educational background in physics.
- Lack of interest to learn physics.
- Shortage of time after class to do practical activities.
- Lack of participation in doing group works.
- Shortage of mathematics knowledge.
- Peer group influence.

5.2 conclusions

The extremely high gender disparity in physics field of study in Awi zone preparatory schools appear to be caused by multiple factors that influence females' attitude, interest and performance in this field. Among the investigated factors in this study, the gender stereotyping of subjects as male female domains, the perception that considers females incapable of doing physics as males do, as a consequence of which, low expectation of teachers, parents and peers to females' performance in physics appear to be the major factors that contribute to females' low participation in this field. Ample evidences show such perceptions are widely being transmitted in the school environment. Since teachers are the most influential persons in the school environment, particularly the existence of such perceptions among teachers appear to be highly influential to females' attitude and performance to physics field for they may directly or indirectly transmitted messages that hinder females to enroll in this area of study. The classroom behavior reflected by female students such as low-confidence and low-efficacy perceptions in physics seems to be resulted from such influences.

In addition to this the home environment in which female students live during their schooling seems to contribute to their existing tendency towards physics field. The fact that parents give less importance to their daughters' education and that they are responsible to much more domestic labor seem to put female students in a disadvantages position than male students. This is because the unequal domestic work load leaves them with no or little time to study their subjects at home. This situation particularly affects their attitudes and performance towards physics because this subject is believed to require relatively more time to exercise it. As a result, female students could not acquire the necessary background knowledge at lower class to pursue the study at preparatory schools. So these factors in the home environment may partly affect females' performance in physics.

Furthermore, the widely prevalent perception that females are more talented in the social science stream and hence they would be more successful in language subjects than in physics.

Finally, gender disparity in physics performance is very high due to the factors indicated in the summary part. So this problem should be given the attention it deserves.

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Appendix AI

Addis Ababa University

School of Graduate Studies

Department of curriculum and teachers professional development studies

Questionnaire: to be filled by female students of preparatory schools in Awi zone

Dear students

The purpose of this research is to study factors affecting the academic performance of female students in physics in Awi zone preparatory schools. The result of the study is expected to indicate factors (problems) related to female students academic performance in physics which will help to provide some suggestions or recommendations on how to overcome the problem. Your experiences and suggestions are worthwhile for the study and I am confident you appreciate the efforts and cooperate by offering honest and frank responses.

Thank you for your cooperation in advance

Direction

No need of writing your name

Put the "X" mark in the box where the alternative answers are given

If you do not get any satisfying answer among the given alternatives, you can write your answer on the back of the paper provided

Write your personal information in the space provided

Name of your school _____

Grade _____; age; 16__20 ☐ 21___25 ☐ 26___30 ☐ above ☐

Marital status single ☐ Married ☐ Separated/Divorced ☐

Place of your residence before joining the preparatory school; Rural area Town

How far is the school distance from your residence in Km _____

What was your grade 10 national examination result in physics_____?

What is your result of physics at present (in the present grade level)? semester result _____?

The following are factors that may affect the academic performance of female students in preparatory schools. Indicate the extent to which each impedes the academic performance using "X" mark

Strongly agree=1 Uncertain=3 Disagree Agree=4

Agree =2 Strongly disagree=5

Item	1	2	3	4	5
4.1 Home related factors					
4.1.1 Lack of parental financial support					
4.1.2 Lack of parental moral support					
4.1.3 Father's poor educational background					
4.1.4 Mother 's poor educational background					
4.1.5. Mother's lower occupational status					
4.1.6. Father's lower occupational status					
4.1.7.Parental perception of physics is as a masculine subject					
4.1.8. Parent's low expectation about females academic performance of physics					
4.1.9. Making female students family responsibility (childcare)					
4.1.10. Others please specify					
4.2. School related factors					
4.2.1. Lack of physics text books					
4.2.2. Lack of physics reference books					
4.2.3. Forcing female students to join the natural science stream without their choice but for the sake of fulfilling 70% towards science					
4.2.4. Lack of library services					
4.2.5. Lack of laboratory services					
4.2.6. School distance from student's home					
4.2.7. Irrelevant of physics curriculum to the female students need					
4.2.8. Not creating conditions conducive to do practical activities for females					
4.2.9. Lack of motivation female students to do exercises in the class					
4.2.10. Physics teachers do not motivate (initiate) female students to do home work					
4.2.11. Lack of teachers support for female students					
4.2.12 Teachers ineffective instructional method in physics					
4.2.13. Teachers low expectation of females' ability of getting good grades in physics					
4.2.14. Others please specify					
4.3 Self related factors					
4.3.1. Perception of the subject physics as being too difficult					
4.3.2. Lack of confidence due to students educational background in physics					
4.3.3. Lack of interest to learn physics					
4.3.4. Shortage of time after class to do practical activities					
4.3.5. Lack of participation in doing group works					
4.3.6. Shortage of mathematics knowledge					
4.3.7. Peer group influence					
4.3.8. Others please specify					

Appendix AII

Interview guide questions for school principals

1. Do you think that female students achieve lower in physics than male students? Why?
2. What was your role for female students to join natural science stream?
3. Would you list factors that affect female student's academic performance in physics? How?
4. What do you suggest to overcome the problem?

Appendix AIII

Interview guide questions for physics department heads

1. Do you believe that female students are equal to boys in any activities of physics?
2. What are the factors that can influence on female students to join or not to join natural science stream? How?
3. What does female students performance in physics looks like?
4. What is your opinion about female students' knowledge of mathematics that influences their academic performance in physics? How?

Appendix B The respondents' frequency and percentage

Item		1	2	3	4	5	$\mu=\sum fx/N$
4.1 Home related factors							
4.1.1 Lack of parental financial support	f	115	58	7	24	19	2.0
	%	51.6	26.0	3.1	10.8	8.5	
4.1.2 Lack of parental moral support	f	86	69	5	33	30	2.3
	%	38.6	30.9	2.2	14.8	13.5	
4.1.3 Father's poor educational background	f	108	68	12	13	22	1.9
	%	48.4	30.5	5.4	5.8	9.9	
4.1.4 Mother' spoor educational background	f	112	70	9	12	20	1.9
	%	50.2	31.4	4.o	5.4	9.0	
4.1.5 Mother's lower occupational status	f	107	64	13	18	21	2.0
	%	48.0	28.7	5.8	8.1	9.4	
4.1.6 Father's lower occupational status	f	95	88	7	18	15	2.0
	%	42.6	39.5	3.1	8.1	6.7	
4.1.7 Parental perception of physics is as a masculine subject	f	110	62	4	22	25	2.1
	%	49.3	27.8	1.8	9.9	11.2	
4.1.8 Parent's low expectation about females' academic performance of physics	f	107	66	10	17	23	2.0
	%.	48.0	29.6	4.5	7.6	10.3	
4:1.9 Making female students family responsibility(childcare)	f	105	61	12	22	23	2.1
	%	47.1	27.4	5.4	9.9	10.3	
4.2 School related factors							
4.2.1 Lack of physics text books	f	104	81	2	14	22	2.0
	%	46.6	36.3	0.1	6.3	9.7	
4.2.2 Lack of physics reference books	f	21	31	10	72	89	3.8
	%	9.4	13.9	4.5	32.3	39.9	
4.2.3 Forcing female students to join the natural science wit out their choice but for the sake of fulfilling 70% towards science	f	90	67	7	23	36	2.3
	%	40.4	30.0	3.1	10.3	16.1	
4.2.4 Lack of library services	f	18	26	14	78	87	3.9
	%	8.1	11.7	6.3	35.0	39.0	
4.2.5 Lack of laboratory services	f	108	91	7	8	9	1.7
	%	48.4	40.8	3.1	3.6	4.0	
4.2.6 School distance from students' home	f	83	84	11	28	17	2.2
	%	37.2	37.7	4.9	12.6	7.6	
4.2.7 Irrelevant of physics curriculum to the female students need	f	28	33	25	56	81	3.6
	%	12.6	14.8	11.2	25.1	36.3	
4.2.8 Not creating conditions to do practical activities for females	f	92	74	12	20	25	2.2
	%	41.3	33.2	5.4	9.0	11.2	
4.2.9 Lack of motivation female students to do exercises in the class	f	97	80	10	25	11	2.0
	%	43.5	35.9	4.5	11.2	4.9	
4.2.10 physics teachers do not motivate(initiate) female students to do homework	f	84	69	12	32	26	2.3
	%	37.7	30.9	5.4	14.4	11.7	
4.2.11 Lack of teachers support for female students	f	70	80	9	37	27	2.4
	%	31.4	35.9	4.0	16.6	12.1	
4.2.12 Teachers ineffective instructional method in physics	f	26	26	23	71	77	3.7
	%	11.7	11.7	10.3	31.8	34.5	
4.2.13 Teachers low expectation of females' ability of getting good grades in physics.	f	94	79	11	27	12	2.0
	%	42.2	35.4	4.9	12.1	5.4	
4.3 Self related factors							
4.3.1 Perception of the subject physics as being too difficult	f	120	69	7	15	12	1.8
	%	53.8	30.9	3.1	6.7	5.4	
4.3.2 Lack of confidence due to students educational background in physics	f	115	70	11	15	12	1.8
	%	51.6	31.4	4.9	6.7	5.4	
4.3.3 lack of interest to learn physics	f	78	75	6	33	31	2.4
	%	35.0	33.6	2.7	14.8	13.9	
4.3.4 Shortage of time after class to do practical activities	f	90	81	7	25	20	2.1
	%	40.4	36.3	3.1	11.2	9.0	
4.3.5 Lack of participation in doing group works	f	94	75	10	23	21	2.1
	%	42.2	33.6	4.5	10.3	9.4	
4.3.6 Shortage of mathematics knowledge	f	94	66	9	33	21	2.2
	%	42.2	29.6	4.0	14.8	9.4	
4.3.7 peer group influence	f	86	71	12	32	22	2.3
	%	38.6	31.8	5.4	14.4	9.9	

Appendix C

Table that shows population of female students and sample size in each selected schools.

School	Grade	No of Female Students	Sample Size
Dangila	11	210	63
	12	146	44
Injabara	11	126	38
	12	104	31
Chaginie	11	80	24
	12	77	23
Total		743	223

Appendix D

The table that shows the interviewees' given code

OCCUPATION	SCHOOL'S NAME	CODE GIVEN
PRINCIPAL	DANGILA PREPARATORY SCHOOL	P1
PHYSICS DE/PT HEAD	DANGILA PREPARATORY SCHOOL	T1
PRINCIPAL	INJABARA SECONDARY&PREPARATORY SCHOOL	P2
PHYSICS DE/PT HEAD	INJABARA SECONARY&PREPARATORY SCHOOL	T2
PRINCIPAL	CHAGINIE SECONDARY&PREPARATORY SCHOOL	P3
PHYSICS DE/PT HEAD	CHAGINIE SECONDARY&PREPARATORY SCHOOL	T3

Declaration

I, the undersigned declare that this thesis is my original work, has not been presented for a degree in any other university and that all sources of materials used in this thesis have been duly acknowledged.

Name Assaye Mekonnen

Signature _____

Date 24 May, 2011

This Thesis has been submitted for examination with my approval as a university advisor.

Name Enguday Ademe (PhD)

Signature_____

Date of submission_____