ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES
DEPARTMENT OF PSYCHOLOGY

ACHIEVEMENT MOTIVATION, SELF-ESTEEM, AND LEARNING SYLES IN RELATION TO MATHEMATICS AND PHYSICS ACHIEVEMENT BETWEEN WUKRO SOCIAL DEVELOPMENT PROGRAM SUPPORTED AND NOT- SUPPORTED STUDENTS

BY
BELAY GIZAW

JUNE 2009

ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

DEPARTMENT OF PSYCHOLOGY

ACHIEVEMENT MOTIVATION, SELF-ESTEEM, AND LEARNING SYLES IN RELATION TO MATHEMATICS AND PHYSICS ACHIEVEMENT BETWEEN WUKRO SOCIAL DEVELOPMENT PROGRAM SUPPORTED AND NOT- SUPPORTED STUDENTS

BY

BELAY GIZAW

JUNE 2009

ACHIEVEMENT MOTIVATION, SELF-ESTEEM, AND LEARNING SYLES IN RELATION TO MATHEMATICS AND PHYSICS ACHIEVEMENT BETWEEN WUKRO SOCIAL DEVELOPMENT PROGRAM SUPPORTED AND NOT- SUPPORTED STUDENTS

A Thesis Submitted to the School of Graduate Studies of Addis Ababa University in Partial Fulfillment of the Requirements for the Degree of Master of Arts in Psychology (Measurement and Evaluation)

BY

BELAY GIZAW

June 2009

ACKNOWLEDGMENTS

I wish to express my heartfelt gratitude and deep appreciation for unrestrained cooperation and guidance which were rendered to me by my advisor Ato Yekoyealem Desse.

Special thanks is due to w/ro Meaza Kahsai ,Walta and Rewina Berhane for their unreserved support given to me without whose help I would not have succeeded in my study.

A special thanks is also due to my brother Ato Kassahun Gizaw for his moral and material support.

I am also happy to acknowledge to Wukro high school teachers for their co-operation given to me in collecting the data used in the study.

Table of Contents

List of tables **page**

LIST OF ABBREVIATIONS

AM : Achievement Motivation

ALS : Auditory Learning Styles

KLS : Kinesthetic Learning Styles

MA : Mathematics Achievement

MAM : Mathematics Self-Esteem

PA : Physics Achievement

PAM : Physics Achievement Motivation

PSE : Physics Self-Esteem

SE : Self-Esteem

VLS : Visual Learning Style

Abstract

It *has been suggested in different research articles that academic performance is equally influenced by non-cognitive variables as it is so by the cognitive ones. The present study has intended to see whether non-cognitive factors such as achievement motivation, self-esteem and learning styles do have an influence on students' mathematics and physics achievement. Information concerning the variables mentioned was collected using achievement motivation, self-esteem and learning styles questionnaires from a(109)WSDP-supported and (108)WSDP-not supported sample of Wukro high school students. Three semester average academic achievement of each student was collected from the record office of the school. The obtained data were analyzed using t-test, correlation, multiple and step-wise regressions. Significant difference in academic achievement motivation, mathematics and physics achievements was reported between groups .WSDP-not supported students have better achievement motivation and achieve better in academy. But no significant self-esteem difference was reported even though the mean of WSDP-non supported students is slightly greater than the supported students. Achievement motivation and self-esteem contributed to the prediction of mathematics achievement but achievement motivation was the only significant contributor for physics achievement. While the learning styles-visual, auditory and kinesthetic were not significant predictors of both mathematics and physics achievements and were removed from the regression equation. Since the obtained results convey a message to educationalists, implications are suggested as directions for further research.*

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

Non-cognitive factors have the power to facilitate or hinder cognitive achievement. Thus, emphasis should be given to these variables in predicting academic performance in schools (Entwisttle, 1972 and Harre and Lumb, 1983 cited in Kifle, 2004). Among these non-cognitive variables or personality factors achievement motivation, self-esteem and learning styles are some of the prominent ones.

Motivational factors are among the non-cognitive variables which bring achievement differences among students. According to Rabideau (2005), motivational factors are crucial to an individual whenever a person achieves any thing significant as a result of learning and feeling.

The most prominent and popular motivational factor which drives students to accomplish something is achievement motivation. As Weiner (1986) indicated achievement motivation is described as the accomplishment of some thing difficult, mastering ideas, to manipulate or organize persons, and objects in physical environment. Besides, motivated persons prefer working independently, and try to overcome obstacles.

According to Klein (1982), people with high achievement motivation are highly motivated to perform, more likely to prefer task of intermediate

difficulty, respond to events at more efficient level and persist longer in the face of failure as compared to people with low achievement motivation.

The motive to achieve may alter the tendency to succeed in two different ways first it may influence the value a person places on successful task performance and secondly it may influence the extent to which a person feels confident of being able to master a challenging task (Kukla, 1978). Schmitt & Brunstein (2004) explain this point further that individuals high in achievement motivation anticipate greater satisfaction from success than individuals low in achievement motivation, and individuals high in achievement motivation have more optimistic explanations than individuals low in achievement motivation.

Self-esteem is also one of the influential non-cognitive variables which can affect pupils' school achievement either positively or negatively. According to Blascovich and Tomake (1991), Self-esteem is a widely used concept both in popular language and in psychology. Self-esteem refers to an individual's sense of his or her value or the extent to which a person values, approves, appreciates, praises, or likes him or herself.

According to Coopersmith (1967), one's ability becomes closely linked to one's perception of self-worth. Persons who hold a positive self view see themselves as capable, significant, successful and worthy and those with negative view of themselves tend to feel that they are not very important

and thus, lack self-confidence and faith in their abilities. Coopersmith further denoted that in schools most students are likely to see their own worth in terms of their academic achievement. And when academic failure occurs, it results in a sense of shame and diminished evaluation towards them-selves which is related to perceptions of low ability. That is why many researchers have directly and indirectly addressed the relation between self-esteem and academic achievement.

Academic achievement can be measured by grades or standardized test scores. Most researches on the relation between academic achievement and self-esteem have used grades to measure achievement, and virtually most researchers have found that grades are positively associated with self-esteem (Brookover, 1964 cited in Buttler and Tucker, 1995).

Within the field of education learning styles have also received much attention both in pedagogy and research. A person's learning style is hypothesized to be a combination of cognitive, affective and psychological characteristics that described how that individual interacts with his or her environment (Theis, 1993 cited in Krätzic & Arbuth, 2006). According to him, learning style is a set of biological and developmental characteristics that make learners understand identical instruction differently.

Ones learning style is the way one tends to learn best. It involves individuals' preferred method of taking in, organizing, and making sense of

information (Marsh &Hadrill, 2007). Handy (1994) says individuals can preferentially take in and process information in different ways, such as by seeing, hearing, and acting. Learning styles refer to the variations in one's ability to accumulate as well as assimilate information.

There is individual difference in learning style that leads to different academic success in each individual's performance. No one has exclusively one single style or preference (Dressel, 1976 & Nelson, 1998). According to these researchers, there are no findings to suggest that students are confined to learn in only one way; rather individual learners have different types of learning styles that are linked to a range of preferences from particular cognitive strategy to the specific environmental conditions.

Although learning style theorists interpret this personality variable in various ways, according to Thomas, Hawr and Amit (2007) nearly all models have two things in common. These are:

- The first one is focus on process. Learning style models tend to concern themselves with the process of learning, how individuals absorb information, think about information, and evaluate the result.
- The second gives emphasis on personality. Learning style theorists generally believe that learning is the result of a personal, individualized act of thought and feeling.

Based on the back ground discussed above, the main focus of this study is to see the difference between the Wukro Social Development Program (WSDP)-supported students and WSDP-non supported students with regard to their achievement motivation, self-esteem, and mathematics and physics achievement. In addition to this relationship between achievement motivation, self-esteem and learning styles with students' mathematics and physics achievement, and the most preferred learning style among students will also be assessed. The Wukro Social Development Program (WSDP) is a social welfare program which was established, by father Angel Olara, a Saint Mary missionary, to support the education of orphans, single mother sons and daughters who are denied of access to education because of poverty.

1.2 Statement of the problem

The main focus of this study is to see achievement motivation, self-esteem and mathematics and physics achievement differences between WSDP-supported and WSDP-not supported students. In addition, the study focuses on investigating the relationship between achievement motivations, self-esteem and learning styles with students' mathematics and physics achievement and on identifying the most preferred learning style used by Wukro senior secondary school students. Achievement motivation's influence on students academic achievement has been studied by different Ethiopian researchers (Girma, 1997; Kifle, 2004; Desta, 2006; and Mustofa, 2006).And impact of self-esteem on students'

achievement was also studied by researchers (Solomon, 1999; Baihru, 1999; and Zenawi, 1997). But, to the best knowledge of the researcher, the relationship of these variables (achievement motivation, self-esteem, and learning styles) together with students' mathematics and physics achievement and students' difference with regard to these variables have not yet been addressed hitherto.

Therefore, this research is intended to answer the following research questions:

1. Is there a statistically significant difference between WSDP supported and WSDP-not supported students in their achievement motivation self-esteem, mathematics and physics achievement?
2. Do achievement motivation, self-esteem and learning styles have significant relationship with students' mathematics and physics achievement?
3. Are achievement motivation, self-esteem and learning styles separately and/or jointly contribute to the variations in students' achievement in mathematics and physics?
4. Which learning style do students prefer most in Wukro high school?

1.3 Objective of the study

The general objective of this study is to investigate differences in achievement motivation, self-esteem, and mathematics and physics achievement between WSDP-supported and WSDP-not supported

students. More specifically, the objective of this study focuses on the following points:

1. To examine whether WSDP-supported and WSDP-not supported students exhibit differences in achievement motivation self-esteem, and mathematics and physics achievement
2. To see the relationship among achievement motivation, self-esteem and learning styles with students' mathematics and physics achievement.
3. To see the combined and individual contribution of the predictor variables(achievement motivation, self-esteem and learning styles) on each criterion variable(mathematics and physics achievements)
4. To identify the most preferred learning style used by Wukro high school students.

1.4 Justification and significance of the study

Wukro High School is one of the schools that the researcher has had an opportunity to teach in earlier times. This high school gives service to students from the surrounding rural kebeles as well as from within the town. Among these, there are students who carried out their education under the support of Saint Mary Catholic Church. There is a program called Wukro Social Development Program (WSDP) financed and supervised by the Church. This program supports students who are orphans as well as those from poor families. This program covers monthly food, house rent and school supply expenses to students. In addition to

this, the program offers after school tutorial classes to the students who attend grades10 and 12 since these students are expected to take national examinations. During the researcher's stay in Wukro, he had the chance to teach tutorial classes to these students as a part timer. This had given him an opportunity to meet the students in both tutorial and regular classes. This opportunity enabled the researcher to observe students' negligence and low motivation towards their education. The students' negligence and low motivation was a point of controversy between students and teachers. The researcher, as a teacher, was asking him self what the reason behind could be. And he wished he could discover this through research.

Fortunately enough, the researcher happens to carryout a research as a partial fulfillment of his MA degree and has decided to conduct his study around these students and students who are not supported by WSDP so as to come up with a response to the question which had been in the researcher's mind for a long time.

Therefore, this study tries to see whether or not there is a difference in achievement motivation, self-esteem, and mathematics and physics achievement between the WSDP-supported and WSDP-not supported students. In addition to these, the relationship between achievement motivation, self-esteem and learning styles with students' mathematics and physics achievement and the most preferred learning style among students will also be assessed.

In general, the significance of this study is based on the following themes:

1. It can provide information to teachers, principals and other concerned offices about the existing problems around these students. And it may help them to take corrective measures to help these students.

2. It can be a source of information for parents, WSDP officials about the students' present academic status.

3. It may encourage teachers to present their lessons to their students using appropriate teaching methods in order to help the students' with different learning styles.

4. It can provide fertile ground to those interested to make further study on this area.

1.5 Delimitation of he study

This study will be confined to students of grade ten in Wukro secondary school. The reasons that forced the researcher to be limited to this high school are time, and financial constraints and the interest of the researcher to the area.

1.6 Operational Definitions

Achievement motivation: refers to students' perceived self-competence and need to be effective with mathematics and physics subjects.

Self-Esteem: refers as self- judgment of worthiness that is expressed in attitude the individual holds towards mathematics and physics.

Learning styles: refers individuals preferred way of assimilating and retaining new information.

- **Visual learning style** – refers to learning style in which learners prefer to learn through flow charts, diagrams, using visual memory.
- **Auditory learning style** – refers to learning style in which learners prefer to learn through lecture, discussion and study group
- **Kinesthetic learning style** – refers to learning style in which learners prefer to learn through moving, doing, acting out and touching objects.
- **Mathematics and Physics achievement** – students' three semester average result of mathematics and physics

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 CONCEPT OF ACHIEVEMENT MOTIVATION

Theorists have proposed that peoples' achievement goals affect their achievement related attitudes and behaviors. Types of achievement related goals include mastery versus performance orientation (Ames & Archer, 1988)

Mastery and performance goals represent different conceptions of success and different reasons for approaching and engaging in achievement activities (Nicholls et al.,1989).And involve different ways of thinking about one self, one's task, and task out comes (Buttler,1987 & Nicholls,1984).

Mastery orientation means that the focus of attention is on the task rather than on some extrinsic reward (Nicholls, 1992 cited in Kaplan & Midgley, 2001). Learning, understanding, solving problems, and developing new skills are ends in themselves (Ames & Archer, 1988). Mastery oriented students tend to see mastery as dependent on effort, and perception of ability are self referenced (Duda & Nicholls, 1992). According to Weiner (1986), the centre to the mastery goal is a belief that effort and outcome co varies it is this attribution belief pattern that maintains achievement-directed behavior over time.

As Ames(1992); Brophy (1983); Meece, Blumenfeld & Holly (1988),with a mastery goal individuals are oriented to ward developing new skills, trying to understand their work,

improving their level of competence, or achieving a sense of mastery based on self referenced standards.

Moreover, when mastery goals are adopted, pride and satisfaction are associated with successful efforts Jagacinski & Nicholls (1987),and guilt is associated with inadequate effort (Wentze,l991).Mastery 0rientation have also been associated with preference for challenging work and risk taking Ames & Archer (1988) and Elliott & Dweck (1988),and positive attitude toward learning . Butler (1987) also said on this point that, mastery goals increase the amount of time students spend on learning tasks and their persistence in the face of challenge, more importantly the quality of their engagement in learning.

As McCombs (1984) also active engagement is characterized by the application of effective learning and problem-solving strategies, and students' use of these strategies is dependent on a belief that effort leads to success and that failure can be remedied by a change in strategy.

According to Gable, Elliot and Church (2001) mastery goals are more likely to result in motivated and engaged learning approaches and, as a result, superior performance. Research evidence also suggests a motivational pattern likely to promote long-term and high quality involvement in learning. As Butler (1999), one example of activity where someone strives to mastery and demonstrates superior ability is school work. However situational cues, such as the person's environment & surroundings can affect the success of achieving a goal at any time.

On the other hand, performance goal oriented students are largely influenced by a desire to demonstrate competence in relation to others; thus their motivation to achieve is conditioned by a desire to appear more accomplished than others and to avoid situations where a lack of skill or ability may be perceived by on lookers (Elliott et al., 2005). When performance goal is adopted self-concept of ability becomes an important determinant of students' achievement related behavior Dweck (1986), because students' focus is on ability and normative performance. Students with low self-concept of ability are less likely to choose challenging tasks (Pint rich & DeGroot, 1990).

Convington & Omelich (1984), suggest on this that when a person adopts a performance goal, perceived ability outcome linkage guides his or her behavior so that the person's self-worth is determined by a perception of his or her ability to perform. As a consequence, the expenditure of effort can threaten self-concept of ability when trying hard doesn't lead to success. Moreover, performance goal orientation could lead to a tendency to helplessness as a response to failure, negative affect following failure, use of in effective strategies and decreases in subsequent performance.

Research findings about the importance of performance goals on learning are inconsistent. Some showed a variety of undesirable outcomes such as challenge avoidance and surface learning Elliott & Dweck (1988), academic cheating Anderman et al. (1998) or lowering achievement value overtime. But HarackieWicz et al. (1998), show that performance goal orientation has positive gain.

The influence of an individual's need and desire has a strong impact on the direction of their behavior. Motivation is based on one's emotions and achievement related goals. Achievement motivation is one of the different forms of motivation, it is the need for success or the attainment of excellence and it is based on reaching success and achieving all of our aspirations in life (Harackiewicz et al., 1998).

Achievement motives include the need for achievement and the fear for failure. These are more predominant motives that direct our behaviors toward positive and negative outcomes. Achievement motivation is the need to achieve (nAch). nAch is a desire to accomplish something difficult, such as the manipulation or organization of physical objects, ideas or other people (Murray,1958 cited in Klein ,1982).According to Murray a person striving to achieve usually works independently of others, and as rapidly as possible. Murray further denoted that the need to achieve causes a person to overcome great obstacles not only to attain a high standard of excellence but also to surpass the success of others. The high achiever in Murray's view is an ambitious and competitive person determined to be successful.

Klein (1982) also discovered that high need for achievement subjects perform significantly better than low need for achievement subjects. Accordingly people with high need for achievement were motivated to do well but people with low need for achievement were not.

Achievement motivation has long been associated with task difficulty preferences. In an early formulation of achievement motivation theory, Atkinson, 1961 cited in Rush & Slade (1991) proposed that positively motivated subjects (subjects with motive to achieve success stronger than motives to avoid failure) would prefer task of moderate difficulty, where as negatively motivated subjects (subjects with motive to achieve success weaker than motives to avoid failure) would prefer either very easy or very difficult task.

McClelland (1985) on this point said that a large number of empirical studies have demonstrated that subjects high in need for achievement prefer working on moderately difficult tasks in which the probability of success lies some where between.30 and .50 where as subjects low in need for achievement prefer working on easy or difficult tasks.

Weiner (1985) has argued that the reason why subjects with high need for achievement choose moderately difficult tasks is that such tasks are more diagnostic of how well they are doing. If the task is easy they will not know whether success was due to their efforts, because everyone can do it, and if the task is difficult they will also not be able to tall what their efforts produced, because they will fail. Thus they seek moderate tasks to get information on the impact of their effort on performance.

Atkinson's (1964) view of achievement motivation also reflects a combination of drive and cognitive approaches. According to Atkinson, positive affective

anticipation of success motivates a person to approach on achievement oriented situations. The strength of these emotional responses or the tendency to approach success is determined by the level of person's internal desire to be successful, the perceived probability of success, and the incentive of value of success. Atkinson further pointed out that the motive to achieve is a demand for a goal; it is a person's stable personality disposition to seek success. This motive to achieve success is characterized as a capacity to experience pride in accomplishment, remains stable from situation to situation .Atkinson further suggests that people with high need for achievement have a higher motive to achieve value than people with low need for achievement.

Concerning students' persistence on a given task, Feather (1961) cited in Birch & Veroff (1966) reasoned that persistence ought to depend on a probability of success. That is, subjects high in need for achievement should persist longer when they begin to fail at an easy task than when they fail at a very difficult task. The reason for this according to Feather is, as subjects begin to fail at an easy task that is supposed to have .70 probability of success , the perceived probability of success begins to be less and move to an area of maximum attraction for subjects high in need for achievement namely, the area of moderate probability of success. Feather added that a hard task with a probability of success of only .05 should have little attraction for subjects high in need for achievement as they begin to fail.

Outside incentive, other than the academic outcome itself, have different implications to people with high need to achieve and to people with low need to achieve. Birch & Veroff (1966) on this point said that only those subjects characterized by low achievement motive increase their performance when pressure is put on them to do a good job. Subjects with high achievement motive don't shift their achievement behavior when such pressure is applied.

2.2 The relationship between achievement motivation and school achievement

A number of researches have been conducted to see whether there is relationship between achievement motivation and academic achievement. Newman (1988) found that the relationship between achievement motivation and various school outcomes seems logical. According to this evidence, outcome such as grades and academic achievement are more likely to be affected by achievement motivation than other outcomes.

McClelland (1985) has also revealed that individuals who possess high achievement motivation have the motive to obtain high academic achievement and show the need to manipulate their environment. People of this type are also action oriented, have better planning ability and have the interest to involve on demanding and challenging tasks. As a result, highly academic motivated individuals tend to obtain superior performance compared to those with low level of achievement motivation.

Individuals high in need for achievement apparently attain a higher grade in school than individuals low in achievement needs (Weiner, 1985). Moreover, individuals high in achievement needs are conceptualized as "hope" rather than "fear" oriented. It has been suggested for instance, that they bias their probability of success upward so their subjective probability of success are greater than the objective probability (Feather, 1965).

According to Wigfield (1991), students' expectations for their school performance influence achievement motivation. Most children entering elementary school have high expectation for success; when asked how they will do on a task, because most early-elementary school children assume that they will do very well. On the other hand older elementary school children are usually not so optimistic about their school achievement, especially after they perform poorly on academic tasks.

According to Weiner & Kukla (1990) cited in Mustofa(2006), the found correlation between outcome and perceived effort expenditure is approximately r=.45 for persons high in achievement concern. Among individuals low in achievement needs this correlation approximates only .10, thus high need to achieve is determinant of outcomes.

People with high need for achievement have a more intense desire to success than people with low need for achievement. A positive relationship has also been reported by (Crook & Atkinso, 1964 as cited in Girma, 1997).On the other hand,

persons low in achievement need perceive that outcome is only weakly influenced by how hard they have tried. However, they believe that personal failure is caused by a lack of ability. According to them, persons with low achievement motivation score showed that a lower level of performance on both arithmetic and verbal tasks than those persons of higher achievement motivation scores.

Similar results have also been reported by a study conducted on senior and junior secondary school students , on their study William, Dawit & Hurt (1971), reported that computed correlation between academic interest and performance of grade nine to have a significant correlation (r=.83) between grade and rating of motivation.

According to Khan (1969) cited in Girma (1997), the correlation between science subjects, social studies, problem solving, arithmetic computation and need to achieve were found to be greater than .20 for both male and female students.

2.3 CONCEPT OF SELF-ESTEEM

Self-esteem is defined in many different ways. So it is very important to mention some of the definitions mentioned by some researchers of self-esteem.

According to Jacobson (1964), self-esteem is expressive of the harmony and the discrepancy between the self representations and wishful concept of the self. Jacobson's self –representation corresponds to what has come to be popular known as actual self-image and her wishful concept of self corresponds similar to ideal self –image.

Coopersmith (1967) sees self-esteem as a personal judgment of worthiness that is expressed in the attitudes the individual holds towards himself. This definition expresses a person judges his worthiness by the degree that he measures up to his ideal self-image, his personal standing of worthiness (the extent to which the individual believes himself to be capable, significant, successful and worthy).

According to Pope, McHale, and Craighead (1988) cited in Solomon (1999), self-esteem is an evaluation of the information contained in the self-concept, and is derived from the individual's about all the things he is. For instance, if an individual place high value on being a superior student but is himself an average or poor student, then his self-esteem will suffer. An individual's self-esteem then is based upon a combination of objective information about oneself and subjective evaluation of that information.

Douvan & Gold (1966) cited in Campbell (1984) too see self-esteem as individual's perception of himself in a number of physical, intellectual, and social activities, and depend upon the evaluation conveyed to the individual by significant others , by the standard of his reference groups and by his perceived effectiveness in achieving goals .

Researchers Ford, Obiakor and Patton (1997) also define self-esteem as the subset of self –descriptive behaviors that indicate self-evaluation. In this instance the individual evaluates certain self-characteristics relative to how he or she values those characteristics.

Gurney (1988) also defines the term as the relative degree of worthiness, or acceptability, which people perceive their self-concept to possess. While these discrepancies in operationally defining the term exists several studies which examine correlation between self-esteem and academic achievement don't provide a common definition for the term (Gaskin-Butler & Tucker, 1995; Simmons, Brown, Bush & Blyth, 1978). These researchers further said that without a common definition to use, researchers conducting studies in this area experiences a significant statistical difficulty when attempting to measure how strong the correlation may be between these factors.

Having these all definitions at hand, it is necessary to find one most useful and serviceable definition to use throughout this research paper. Therefore, the definition self-esteem as a personal judgment of worthiness that is expressed in the attitude the individual holds toward himself will be used throughout this research.

Research literature that usually compares high and low self-esteem might leave the reader with the impression that self-esteem as a single, fixed entity much like a person's height. Actually each person may have high self-esteem in some aspect of his life and low self-esteem in other aspect. There is a multiplicity of facets in an individual's life, in each of which one can have a different levels of self-esteem such as physical appearance, intelligence, wit, child, identity, work place etc. (Campbell, 1984).

Self-esteem may play a role in shaping personality process. Individuals' beliefs about themselves, influence how they act in a particular situations, the goals they pursue in life, how they feel about life events, and relationship partners and the ways in which they cope with and adapt to new environments. Self-esteem typically measured by the degree to which the person endorses various evaluative statements about the self. Differences in such self-report indicate that differences in attention and self-representation. Persons who score high in self-esteem are those who attend to emphasize their abilities, strengths, and good qualities. Persons who score low in self-esteem are those who focus on and emphasize their deficiencies, weakness and bad qualities (Baumeister & Tice, 1985).

Having high self-esteem is what life is all about. High self-esteem is the basis for a good personality and effective social functioning. You can not love others unless you first love your self. Love yourself and others will love you. A high self-esteem enables to win friends and influence people. High self-esteem is mental health (Campbell, 1984). As Dorothy & Briggs (1975), too high and low self-esteem is the main spring that states every individual for success or failure as a human being.

The most detail and forceful definition about high and low self-esteem boys is the one which is pointed out by (Coopersmith, 1967). According to Coopersmith youngsters with a high degree of self-esteem are active & expressive individuals who tend to be successful both academically and socially. They lead rather than merely listen in discussion, are eager to express opinions, don't side step

disagreements, are not particularly sensitive to criticism, are highly interested in public affaires, showed little distractive ness in early childhood and little troubled by feelings of anxiety.

O'Brien & Epstein (1979) cited in Campbell (1984), on their study of 19 females and 10 males also revealed that when self-esteem was raised, there was an elevation in happiness, security, attention, energy availability, alertness, clear mindedness, singleness of purpose, lack of restraint and spontaneity. On the other hand, when self-esteem was lowered, there was an elevation in anger, threat, sluggishness, withdrawal, disorganization, conflict, feeling of restrain and self-consciousness.

2.4 Relationship between self-esteem and academic achievement

Concerning their drives and responses towards academic achievement, high and low self-esteem persons prefer to succeed, but people with high self-esteem expect to succeed more than do people with low self-esteem (McFarlin & Blascovich, 1981). These researchers further denoted that these differences presumably true because high self-esteem is based on the belief that one often and habitually succeed where as low self-esteem is based on a sense that one often fails short of success. The discrepancy between high and low self-esteem may arise either from differential levels of ability or differential patterns of selective perception and memory.

Following initial failure persons high in self –esteem tend to perform better than do persons with low self-esteem. Perez et al. (1973) cited in Blascovich & Tomake

(1984) have also suggested that such improvement in performance of persons with high self-esteem may be due an increase in persistence. Shrauger & Sorman (1977) also demonstrated that high self-esteem subjects persisted more and perform better than did low self-esteem persons after receiving failure feed back. Baumeister et al., 1964 cited in McFarlin et al., 1984 also pointed out that, low self-esteem persons out perform high self-esteem individuals after failure has occasionally been observed.

Generally, according to many researchers like Coopersmith, (1967) low self-esteem individuals have lower performance than high self-esteem individuals.

An increasing body of literature and research has sought to explore the nature of the relationship between self-esteem and academic achievement among students (Williamsburg, 2005). And many personality researchers confirm the existence of relationship between self-esteem and academic performance.

It is important to note that research evidence suggests that the relationship between self-esteem and achievement does not necessarily hold true for general (global) self-esteem (or an overall academic self-esteem), but self-esteem for a very specific subjects such as mathematics, reading and science. Success in a particular subject or area does not need to improve a change in students' self-concept, or global self-esteem but students' task specific self-esteem (Briggs & Moor, 1993).

Researchers in area of self-esteem have considered self-esteem to be un-directional, global self-attitude and they have attempted to find a correspondence

between measure of general feelings of self-worth and measure of specific content domain (eg. reactions to achievement, success and failure). And several theorists criticized the global approach to the measurement of self-esteem (Gecas, 1982, Marsh & Shavelson; 1983). These researchers argue that self-esteem is multifaceted and that success prediction from self-esteem is better attained when self-esteem measures are specific to the domain of interest.

Moreover it seems also reasonable to expect that specific self-esteem factors will be more closely associated with variables directly relevant to their domain than are global self-esteem measures or measures specific to the other domain. Recent evidence does indicate that specific factors of self-esteem are better predictors of measures in their domain than are other types of self-esteem measures (Fleming & Watts, 1980; Hansford & Hattie, 1982; Marsh, Parker, & Smith, 1983,).Thus the use of specific self-esteem measures has lead to greater success in predicting corresponding behaviors and attitudes.

Beside to this, the direction of causality i.e. is self-esteem which causes academic achievement or academic achievement which causes self-esteem has been debate among researchers. And different views have forwarded concerning this point.

Williamsburg (2005) has specifically indicated that achievement in school is an integral factor in creating and maintaining a positive and healthy view of the self. In addition because most schools attain high value to academic success, it often becomes a primary measure by which children judge themselves, their esteem,

and their self-worth as they progress through elementary and secondary education.

Researches conducted by Ford, Obiakor & Patton(1995); Gaskin, Butler & Tucker (1995) have also indicated that improving self-esteem has not been a reliable means of achieving academic achievement. Self-esteem appears to be more of an effect rather than a primary cause of achievement. But recently, most convincing evidence for causality comes from research works which attempt to improve achievement by first improving self-esteem (Lawrence, 1996, & Andrew, 1998). Such works demonstrated that indeed an improvement in students' self-esteem can lead to improvement in academic achievement. Burns (1982) also indicated that whilst academic success raises or maintains self-esteem, it is self-esteem which influences performance through high expectation and motivation. And Chapman (1988) also indicated that self-esteem is considered to be influential in almost any learning task that a child may undertake. Purkey (1970) cited in Watkins & Astilla, 1980 also argued raising students' self-esteem will result not only in greater happiness but also in better scholastic performance.

Concerning correlation relationships between self-esteem & academic achievement many researchers explain their research findings on different occasions. According to Watkins & Astilla (1980) on their study of 173 Filipino high school students, they found the correlation of 0 .33 between self-esteem and school achievement. And they also reported on their study that majority of studies examining the relationship between self-esteem and school achievement ranges between r=0.30 to r=0.45 or low ($r \leq 0.25$). But Brookover (1964) cited in

Solomon (1999) showed that the correlation between GPA and academic self-esteem was r=.57. This shows that, there is higher correlation between academic achievement and self-esteem. Similarly Rubin, Dorle, and Dandridge (1977) cited in Solomon (1999) also reported that the magnitude of correlation between self-esteem and academic achievement is usually from 0.20 to o.45. Bairu, 1999 and Solomon, 1999 also reported positive and significant relation between self-esteem and academic achievement.

2.5 The concept of Learning Styles

What is learning style? An individual's learning style can be defined in many ways, including the complex manner in which, and conditions under which, learners most efficiently and most effectively perceive, process, store, and recall what they are attempting to learn James (1995), or alternatively, the preference or predisposition of an individual to perceive and process information in a particular way or combination of ways (Sarasin,1999) .According to Sarasin, the brain is the organ of learning, and as such, a learning style is likely to be complex, emergent interaction of the neurophysiology of an individual's brain and the unique developmental process that has shaped it through experience and interaction with the environment. Learning style is thus, is a phenotypic characteristic of an organism like any other. Given the plasticity of the human brain and its propensity to learn and likely change synaptically over time, learning styles should be considered to be flexible, not immutable. An individual's learning style could be actively adapted, to a certain extent, to different learning environments.

According to Marsh & Hadrill (2007) too, one's learning style is the way one tends to learn best. It involves one's preferred way of taking in, organizing and making sense of information. They further said that learning styles don't tell us about persons' ability or intelligence, but they can help us to understand why some tasks seem easier for one than others.

As Buch & Bartten (2002) also people prefers to learn in ways that are different from other people of the same class, religion, or culture. This individual preference of how to learn is called the learning style.

Cab, Dunn & Dunn (1991) also define learning styles associating with individual's finger print. According to them, everyone has a learning style, but each person's learning style, is different like finger prints. Finger prints are similar in many ways, but specialists trained to tell the difference can identify which belongs to whom..

Keefe (1979) too define learning styles as the composite of characteristics like cognitive, affective, and physiological factors that serve as relatively stable indicators of learner perceives, interacts with, and respond to the learning styles as those educational conditions under which a student is most likely to learn. These learning styles are not really concerned with what learners learn, but rather how they prefer to learn.

Learning style research has history that can trace back some 100 years. It essentially concerns it self with identifying and categorizing the habits and other behavior of individuals as they approach different learning situations rather than how well they complete the tasks encountered within them (Pask, 1976). But the

term learning style has been used in the literature during the past thirty years. According to Theal (2003) also, the best validated conception of learning styles stem from research began in Sweden in the mid -1970's by Ference Marton and Roger Saljo.

In general, learning styles refer to the variations in one's ability to accumulate as well as to assimilate information. Basically one's learning style is the method that best allows learners to gather and use knowledge in a specific manner. Most experts agree that there are three basic types of learning styles .Each individual may possess a single style or could possess a combination of different learning styles.

2.5.1 Different models of learning styles

The VAK concept, theories and methods(initially also referred to us as VAKT) were first developed by psychologists and teaching specialists such as Fernald, Keller, Orton, Gillingham, stillman and Montessori, beginning in the 1920's. The VAK multisensory approach to learning and teaching was originally concerned with the teaching of dyslexic children and other learners for whom conventional teaching method where not effective (Tanner and Allen, 2007).

The VAK learning style uses the three main sensory receivers: visual, auditory, kinesthetic (movement) to determine their dominant learning style. It is some times known as VAKT (Visual, Auditory, kinesthetic and Tactile). It is based on modalities channel by which human expression can take place and is composed of combination of perception and memory. VAK is derived from

the accelerated learning world and seems to be about the most popular model nowadays due to its simplicity (Rourke, et. al., 2002).

According to Smith (1996), the VAK is developed from neuro-linguistic program research. The most popular analysis identifies the three learning styles: visual, auditory, and kinaesthetic (sometimes the 'a' is missed of kinesthetic). Sometimes kinaesthetic is said to include tactile learning and sometimes this is added as a separate style. Some analysts add read/Writing to make VARK and some subdivided the visual and auditory categories into verbal and non verbal.

Learning style models are systems for classifying how we perceive and take in information, how we process and organize that information, and how we react and feel in terms of our personality patterns. Some focus more on just one of those dimensions, say perceiving, others more on a mixture (McCarthy, 2008). McCarthy further denoted that perceptual models also called sensory models refer to the primary way we take in i.e. perceive information. These models distinguish between the ways we receive, understand, and absorb information such as through visual, auditory & kinesthetic means. Sensory/perceptual models don't really worry about what learners learn but how learners perceive information.

The VAK learning style model is one of the simplest and therefore, most popular model. Based on how we perceive information, it uses three sensory models-visual (seeing and reading), auditory (hearing) and kinesthetic

(movement, and tactile or touch) to determine three preferred learning categories (sharp, Byren, & Bowler, 2008). Although all learners can use all of these sensory models in learning, one model is often dominant and preferred.

VAK learning style is easy to understand and internalize, easy to assess, useful as a labeling device to justify treating pupils in a particular ways or having certain expectations of them, such new pedagogical ideas are promoted and paraded through universal media as a fashion garment might be (Riding & Rayner, 1998).

The visual-auditory-kinesthetic learning styles models does not overlay any other learning style model, rather the VAK model provides a different perspective for understanding and explaining a person's preferred or dominant thinking and learning styles and strengths (Chapman & Chislett, 2005). These researchers further said that the VAK learning styles model offers relatively simple methodology. Therefore, it is important to remember that this concept aids to understand overall personality, preferences and strengths of learners.

The VAK learning style model provides a very easy and quick reference by which to assess people's preferred learning styles, and the most importantly, to design learning methods and experiences that much people prefer. The VAK model and the free test provides a free, quick & easy way to assess one's own and other people's preferred learning styles (Chapman & Chislett ,2005).

Identifying students' learning styles help educators understand how people perceive and process information in different ways. Learning styles consist of a combination of motivation, engagement, and cognitive processing habits, which then influence the use of Meta cognitive skills such as situation analysis, self-pacing, self-evaluation to produce a learning outcome Shin (2001).

2.5.1.1 Visual Learning style

Individuals who fall in to this category typically learn through what they are able to see with their own eyes. Visual learners are those students who jockey for the position at the front of the class, must have front row theater seats and love to be right up front in order to obtain the best view. Visual learners have a tendency to describe everything that they see in terms of appearances. These learners love visual aids such as photos, diagrams, maps and graphs. Visual learners frequently are good writers and will commonly perform quite well on written assignments (Constantinidous &Baker, 2002).

It is discovered that many students are visual learners. It is estimated that 65% of the population are visual learners. These students commonly use visual aids, such as graphs and diagrams, to assist them in putting material in to perspective. Such visual aids can make it much easier to remember content later than if they had just heard the information. Visual learners need

to see materials in order to understand it. Such learners typically have problems with directions that are spoken and may also have problems following lectures or even misinterpret words. Individuals who fall into the visual learning category must process information with their eyes. They learn by reading or observing and as a result they are typically good at seeing pictures in their minds of pictures, people, places and sometimes even words (Rourk et. al., 2002).

Visual learners are able to remember how a word looks rather than the sequence of a word or how to sound it out. Visual learners are typically quite good at using graphs and maps and tend to make sure they have something to read when traveling. They also have a proclivity for doing a lot of research before embarking on any trip or major change within their lives (Quesada, 2004)

According to Bissonnette (2005), visual learners tend to exhibit the following characteristics

- Love magazines, books and other types of reading material, relate best to information that is written, such as graphs, maps, diagrams, charts, highlighted notes & flashcards.
- Feel frustrated when unable to take notes.
- May demonstrate outstanding photographic memory, can remember precisely where information is located on a page.

- Must have a quite place to study, benefit from making their notes, even from information that is already printed.
- Have difficulty following lectures that are long, tend to be detail oriented and tend to be good at spelling.
- Typically tidy and organized.
- Often ask for verbal directions to be repeated.
- Must observe instructor's body language and facial expressions.
- Concentrate better with a clear line of sight to visual aids.
- Preferred test styles are essays, maps and diagramming.

2.5.1.2 Auditory Learning style

Auditory or verbal learners are those who prefer to hear materials as they are spoken, such as in a lecture format. It is estimated that auditory learners comprise about 30% of the population. These learners commonly find they are best able to recall information after it has been spoken rather than through reading it (Rourk et al., 2002)

Auditory learners are very good listeners. They tend to absorb information in a more efficient manner through sounds, music, discussions, and teachings. These learners will be more beneficiary listening recorded lectures repeatedly. Auditory learners appreciate books on tape and may find that reading aloud helps them to retain information. Rather than written reports,

auditory learners tend to be better on oral presentations and reports (Quesada, 2004).

According to Bissonnette (2005), individuals with an auditory or verbal learning style typically exhibit the following learning characteristics:

- Frequently talkative in class, Learn most effectively through audio books, lecture, oral presentations and verbal instructions
- Information usually has little relevance for them unless it is heard.
- Prefer presenting oral reports rather than written reports, enjoy debates and discussions.
- Benefit from reading aloud, able to follow verbal directions better than written directions.
- Don't automatically understand maps, diagrams or graphs, but tend to memorize lectures well.
- Prefer listening to the news, enjoy speaking with others, enjoy music and sings frequently
- Benefit from study groups, tend to be an articulate speaker and unable to keep quite for very long time.

2.5.1.3 Kinesthetic/ Tactile/ Learning styles

According to Chapman and Chislett (2005), the word 'kinesthetic' describes the sense of using muscular movement-physical sense. In other words, kinesthesia and kinesthesis are root words derived from the Greece kineo, meaning move, and aesthesis, meaning sensation. Kinesthetic therefore describes a learning style which involves the stimulation of nerves in the body's muscles, joints and tendons. This relates to the colloquial expression 'touchy-feely' (kineo-aisthesis= move sensation).

It is estimated that about 5% of the population are kinesthetic or tactile learners. This kinesthetic learning style refers to the ability to absorb information best by experiencing, touching, doing, moving and being active in some manner. Persons who fall in to this category prefer situations which are hands-on and which provide them with the opportunity to assemble and take part in a physical activity (Rourk et al., 2002).

Kinesthetic learners tend to be touchier or feelers. They process information through the sense of touch, such as by feeling shapes and textures. While they may make a lot of notes or doodle while attending lectures or even while simply thinking something through, often they will not refer to the notes again (Quesada, 2004). According to this researcher, kinesthetic learners tend to be quite in touch with their own feelings. When speaking with someone they frequently have the tendency

to touch the other person on the shoulder or the arm. They may also stand quite close. Kinesthetic learners also usually have a tendency to handle something or fidget with something.

Experiential and hands-on learning activities such as lab work, role playing and making models are usually the best method for this type of learners. In addition, kinesthetic learners are usually to take frequent study breaks in order to avoid becoming easily distracted or bored. A computer can also be useful with this learning style, particularly for reinforcing information through the sense of touch. Students who have kinesthetic learning style frequently find that they lose attention easily. They tend to become distracted or bored very easily within lectures. These individuals often learn best when they are in situations in which they can actually perform or do something. They frequently must rewrite notes in their own words in order to recall relevant facts (Burten, 2007).

According to Bissonnette (2005), kinesthetic learners often exhibit the following characteristics:

- Enjoy action, experience, and discovery, remember best by manipulating things, using tools and enjoy concept demonstration.

- Able to master skills through practice and imitation and benefit from hands-on teaching techniques.

- Learn well from excursions and field trips, hand writing often not good and weak at spelling and uses hands to communicate and talks fast.
- Benefit from role-playing situations and enjoy having music playing in the background while studying.
- Take frequent breaks while studying.
- Enjoys arts and crafts, science experiments, etc.and becomes restless during long lectures.
- Able to learn best when able to freely move about.
- Often studies most effectively while lying down, fiddling with objects, etc.

2.6 Summary of the review of related literature

In general, most of the aforementioned reviews and research findings revealed the following.

a) students who become involved in a task with the purpose of mastering it, who fined it interesting and who like academic challenge are more likely to become highly motivated and show better academic achievement. And people with high need to achieve have a more intense desire to success than those low achievements need people.

b) Students with high degree of self-esteem are active and expressive individuals who tend to be successful both academically and socially.

They lead rather than merely listen in discussion, are eager to express opinions, do not side step disagreements and are not particularly sensitive to criticism. In contrast, students with low self-esteem are incapable of expressing them- selves and too weak academically.

c) Learning style is the way one tends to learn best. It involves one's preferred way of taking in, organizing and making sense of information. Learning styles don't tell us about persons' ability or intelligence but they are helpful to understand person's preference

CHAPTER THREE

Research Design and Methodology

This chapter describes the population, sampling procedure, instruments used and variables included in the study, pilot study, data collection procedure and method of data analysis.

3.1 Population

The target population of the study is WSDP-supported and WDSP-not supported grade 10 students. According to the data obtained from the record office of Wukro Secondary School, the total number of students enrolled in grade 10 were 1392 (420 WSDP-supported and 972 WSDP-not supported).

3.2 Samples and Sampling procedure

Before selecting the subjects included in this study and in order to get the representative sample of the population to be studied, the population was stratified in to three strata based on their achievement as high achievers, medium achievers and low achievers. After the stratification, the sample was determined proportionally. Then, 220 students (108 male and 112 female) were randomly selected as research participants. Again, of the 220 students 110 (50 male and 60 female) were students who are supported by WSDP and the remaining 110 (58 male and 52 female) were WSDP-not supported students. However, of the total 220, 217 questionnaires were properly filled in and returned to the researcher.

The three-semester mathematics and physics average point of the 217 were collected from record office of the high school.

3.3 Instruments and Variables

3.3.1 Instruments

There were three instruments used to collect data regarding the variables under investigation. All the instruments were prepared in Tigrigna, with consultation of two English language experts and one psychology graduate school student who agreed to the translation. The questionnaires were translated in to Tigrigna and then back to English for checking agreements on both forward and back ward translation. And to minimize response bias the items in the questionnaires were arranged randomly.

- Achievement motivation scale- This was obtained from Chiu (1997) and Mustofa (2006) and adapted by the researcher. This scale ask students to give their judgments along a four point Likert continuum ranged from 1(strongly disagree) to 4(strongly agree). Initially 12 items of MAM and PAM were adapted for the study but, based on the response of the pilot group and reliability of subsections obtained; two items from each were deleted. And 10 items, six of which positively phrased and four of them negatively phrased, that are most reliable were selected and made ready for the main study. Scoring is reversed for items which are phrased negatively.

- Self-esteem scale- This was obtained from Bahiru (1999) and Solomon (1999) and adapted by the researcher. This scale also asked students to give their judgments along a four point Likert continuum ranged from 1(Not at all true of me) to 4(very true of me). At the beginning 12 items of each subsection (MSE) and (PSE) were adapted for the study. But based on the response of the pilot study and reliability of each subsection obtained two items from each, which were low in reliability adequacy, were deleted. And 10 items, six of which phrased positively and four of them phrased negatively, which are most reliable were selected for the final data gathering. Scoring is reversed for items which are phrased negatively.
- Learning style inventory – These were obtained from Chapman (2005) and adapted by the researcher in order to make it a better instrument which helped to identify learning styles of learners. Based on the measure of internal consistencies, necessary modification and arrangement of items was made to make the items more reliable and sustainable to the final data gathering. Finally 30 items, ten for each sub-scale (VLS, ALS, and KLS) were administered. This inventory also ask students to give their learning styles preferences along a four point Likert continuum ranged from 1(very little like me) to 4(A lot like me).

3.3.2 Variables included in the study

Variables considered in this study were:

i. Predictor variables

1. Achievement motivation ----------x_1
   - Mathematics achievement motivation --------X_{11}
   - Physics achievement motivation----------X_{12}
2. Self – esteem----------x_2
   - Mathematics self – esteem ----------X_{21}
   - Physics self – esteem----------X_{22}
3. Learning styles
   - Visual learning style – ----------X_3
   - Auditory learning style ----------X_4
   - Kinesthetic learning style ----------X_5

ii. Criterion variables

- Mathematics achievement ----------Y_1
- Physics achievement ----------Y_2
- Achievement----------Y

3.4 Pilot study

For the purpose of revising and determining the relevance and clarity of the instruments and creating conducive condition to the data gathering, a pilot study was carried out on 50 randomly selected students. The subjects were randomly selected from the two groups (23 from WSDP-supported and 27 from WSDP-not supported students) Out of these 50 subjects, four were

failed to give their response properly and were canceled. Thus the pilot study was conducted based on a response of 46 students. Then, the Cronbach alpha for each variable was calculated. Accordingly the Cronbach alpha, measures of internal consistency, reliability were: AM=.74, PAM=.75, MSE=0.68, PSE=0.76, VLS=0.70, ALS=0.71 and KLS=0.66

3.5 Data Collection Procedures

The data collected from 217 students are included in this study. All of the Tigrigna version questionnaires were presented in two sessions. The achievement motivation and self-esteem questionnaires were presented in one session while the other, the learning style questionnaire was presented the next day. The subjects were briefed by the assistants and the researcher on how they are supposed to respond to questionnaires in addition to the explanation given on front page of the questionnaire.

The mathematics and physics academic achievement of the subjects was obtained from the record office of the school. An average of three semester mathematics and physics achievement (two semesters in the previous year and one from the current year's first semester achievement) were considered.

3.6 Method of Data Analysis

The response obtained from the students and their academic achievements were analyzed using SPSS version 12.0 programs. Therefore, the completed questionnaires were marked and scores were assigned to each sub section of achievement motivation, self-esteem and each sub-section of learning styles.

After assigning scores on achievement motivation, self-esteem, learning style variables and mathematics and physics achievement,

a) Independent t-test was computed to determine whether there is a statistically significant difference between WSDP-supported and WSDP-non supported students on the mean score of achievement motivation, self-esteem, and mathematics and physics achievements.

b) Pearson correlations were computed to examine the degree of relationships between the predictor and criterion variables.

c) Multiple and step-wise regressions were used to examine the overall relationship of mathematics and physics achievements with the predictor variables (achievement motivation, self-esteem and learning styles) and to investigate the relative contribution of each of the predictor variable to the variance in the criterion variable.

d) Percentage was used to identify students' learning styles preference. Alpha value of .05 was used for all significance tests.

CHAPTER FOUR

RESULTS

The results of the study are summarize d under the following subheads: Results obtained using t-test, results of correlation analysis, results of multiple regression analysis, and results of step-wise regression analysis on mathematics and physics and on overall achievement.

4.1 Differences between groups

4.1.1 Differences between groups in MAM and PAM

Table 1: Means, standard deviations and t values for MAM and PAM

Variables	Group	N	Mean	SD	T
MAM	WSDP-not support	108	33.8426	4.3945	**2.30***
	WSDP- supported	109	32.5321	3.9920	
PAM	WSDP-not supported	108	33.9352	49668	**2.671***
	WSDP supported	109	32.4679	3.9204	

***P<0.05** **t_{cr} = 1.96**

As table 1 displays, the observed t-value of achievement motivation for mathematics is (MAM) ($t_{(215)} = 2.30$, $p<0.05$) and physics achievement motivation (PAM) ($t_{(215)} = 2.671$, $p<0.05$).This indicates that there is statistically significant difference between WSDP-supported and not-supported students. The mean of WSDP-not supported students were greater than the WSDP-supported students in both MAM and PAM. This implies that WSDP-not supported students are greater in their

achievement motivation for mathematics and physics than the WSDP-supported students.

4.1.2. Differences in MSE and PSE between groups

Table 2: means standard deviations and t-value for MSE and PSE

Variables	Group	N	Mean	SD	T
MAM	WSDP-not supported	108	31.7037	4.1878	**1.440**
	WSDP- supported	109	30.8716	4.3271	
PSE	WSDP-not supported	108	31.6296	6.7528	**0.492**
	WSDP supported	109	31.2110	5.7543	

t_{cr} = 1.96 **P> 0.05,**

As it is shown in Table – 2, there are no statistically significant differences in MSE ($t_{(215)}$ = 1.440, p>0.05) and (PSE) ($t_{(215)}$ = 0.492, p>0.05). These values imply that there is no significant mean difference in MSE and PSE between groups – WSDP-not supported and WSDP supported students. But there was slight mean difference in favor of WSDP – not supported students.

4.1.3 Differences in MA and PA between groups

Table 3: Means standard deviation and t-values for MA and PA

Variables	Groups	N	Mean	SD	T
MA	WSDP-not-supported	108	62.6944	10.4367	**5.019***
	WSDP supported	109	56.4404	7.7297	
PA	WSDP-not supported	108	61.8889	12.2262	**4.916***
	WSDP- supported	109	55.0459	7.8214	

t_{cr} = 1.96 **P< 0.05,**

Table – 3 shows that there is a significant mean difference between WSDP-not supported and WSDP-supported students of their mathematics achievement (MA) ($t_{(215)} = 5.019$, $p<0.05$) and physics achievement (PA) ($t_{(215)} = 4.916$, $p<0.05$). The mean of WSDP-not supported students is greater than the mean of WSDP supported students in both subjects' achievement (MA) and (PA) this reveals that students who are not supported by WSDP are greater in their MA and PA than those supported by WSDP.

4.2. Inter correlation, Multiple and Step-Wise Regressions among variables in mathematics Achievement

4.2.1 Intercorrelation among the variables in MA

Table 4: Result of inter correlation

Variables	X_{11}	X_{21}	X_3	X_4	X_5	Y_1
MAM(x_{11})	1					
MSE (x_{21})	0.409**	1				
VLS (x_3)	0.029	0.242**	1			
ALS (x_4)	0.077	0.165*	0.296**	1		
KLS (x_5)	0.057	0.177**	0.504**	0.302**	1	
MA (Y_1)	**0.308****	**0.271****	**0.023**	**-0.003**	**0.024**	**1**

*** * Significant at the 0.01 level of significance (2-tailed)**

*** Significant at the 0.05 level of significance (2-tailed)**

As indicated in Table- 4, MA (Y_1) criterion variable is positively and significantly correlated with MAM (r=0.308, P<.000) and MSE (r=0.271, p<.000). The other predictor variables VLS and KLS have positive and ALS negative relations with the criterion variable (MA), but VLS, ALS and KLS are not significantly related. The study therefore, confirms that MAM and MSE have significant relation with students' mathematics achievement (MA) at 0.01 significance levels

4.2.2 Multiple Regression analysis in MA

Table 5: Result of Multiple Regression Analysis

Variables	Regression coefficient (B)	Standard error of B (SEB)	Beta	t	p
MAM (x_{11})	.550	.164	.241	3.353	.001*
MSE (x_{21})	.415	.168	.182	2.459	.015*
VLS (x_3)	.069	.172	- .031	.403	.688
ALS (x_4)	- .070	.0	- .053	- .771	.442
KLS (x_5)	- .087	.177	.038	-.492	.623
Constant	29.780	7.114	-	4.186	.000

* Significant at 0.05 level of significant

Multiple correlation (R) = .352 , R^2 = .124, adjusted R^2 = .103

Constant = 29.780

Standard error of estimate = 9.186

Multiple Linear Regression F= value = 5.946, df_1=5 and df_2= 211, P<0.05

Regression Equation:

$$Y'_1 = 29.780 + .550x_{11} + .415x_{21} - .069x_3 - .070x_4 + .087x_5$$

Where X_{11} = Mathematics achievement motivation

X_{21}= Mathematics self –esteem

X_3= Visual Learning style

X_4 = Auditory Learning style

X_5= Kinesthetic Learning style

Table – 5 displays the result of multiple regressions of the predictor variables x_{11}, x_{21}, x_3, x_4 and x_5. The multiple linear regressions reveal that all the predictor variables together contributed 12.4% to the variance explained of the criterion variable MA (y_1). The F-value (5.946) of the multiple regression shows that all the predictor variables combined together make statistically significant contribution at the 0.05 level of significance. As can be noted from table-5, the t-values indicate that x_{11} and x_{21} do contribute to the prediction of y_1 significantly at 0.05 levels of significance.

Generally, according to the result of multiple regression analysis, the majority of the variance in the criterion variable is due to x_{11} and x_{21}.

4.2.3 Step-Wise Regression Analysis in MA

Table 6: Result of step-wise Regression

Step no	Variables entered	Unsta.Reg. coeficient	Standard error Of reg. (SEB)	Standard Reg. coef. (BETA)	multiple		Increase In R^2	F
					R	R^2		
1	X_{11}	.540	.161	.237	.308	.095	-	22.504
2	X_{21}	.396	.161	.174	.347	.120	0.025	14.564
3	ALL	-	-	-	.352	.124	0.004	5.946

Multiple correlation R = 0.347, R^2 = .120, adjusted R^2 = .112

Constant = 29.224

Standard error of estimate = 9.119,

Multiple Linear regression F-value= 14.564, df_1=2, df2=214, P<0.05

Regression equation

$$Y'_1 = 29.224 + .540\ x_{11} + .396x_{21}$$

WhereX_{11} = mathematics achievement motivation

X_{21} = mathematics self-esteem

To evaluate the relative contribution of each predictor variable in predicting the criterion variable and to identify the strongest predictors step-wise regression method is used.

Table-6 shows the result of step-wise regression analysis. The predictor variables considered in this analysis were x_{11}, x_{21}, x_3, x_4 and x_5. In the analysis x_{11} and x_{21} in descending order are found to be significant at .05

levels of significance. The proportion of variance accounted for MA (y_1) by x_{11} was 9.5% and by x_{21} was 2.5%. Had the remaining variables (x_3, x_4 and x_5) been included in the regression model, the total variance accounted for y_1 would have been 12.4%. That is, the increase of variation in y_1 attributable to x_3, x_4 and x_5 is only 0.4%. This indicates that the additive effect of the variables x_3, x_4 and x_5 is not significant.

4.3 Inter correlation, Multiple and Step-wise Regressions among variables in physics subject

4.3.1 Intercorelation among the variables in PA

Table 7: Result of inter correlation

Variables	X_{12}	X_{22}	X_3	X_4	X_5	Y_2
PAM (x_{12})	1					
PSE (x_{22})	0.355**	1				
VLS (x_3)	0.084	0.159*	1			
ALS (x_4)	0.133	0.183**	0.296**	1		
KLS (x_5)	0.061	0.254**	0.504**	0.302**	1	
PA (Y_2)	**0.347****	**0.140***	**0.003**	**- 0.025**	**- 0.034**	**1**

**** Significant at the 0.01 level (2-tailed)**

*** Significance at the 0.05 level (2-tailed)**

Table – 7 shows that, PA (criterion variable) is positively and significantly correlated with PAM (r=0.347, p<0.000) and PSE (r = 0.14, p<.000) The other predictor variables (VLS – positive, and ALS and KLS – negative) have no significant relation with the criterion variable (PA). The study

therefore confirms that PAM and PSE are significantly related with students' physics achievement (PA) at 0.01 and 0.05 significance levels respectively.

4.3.2 Multiple Regression Analysis in PA

Table 8: Result of Multiple Regression Analysis

Variables	Regression coefficient B	Standard error of B (SEB)	Beta	t	p
PAM (x_{12})	.915	.181	.349	5.048	.000*
PSE (x_{22})	.061	.123	.035	.496	.620
VLS (x_3)	.040	.188	.016	.211	.833
ALS (x_4)	- .111	.100	- .077	- 1.108	.269
KLS (x_5)	- .126	.197	- .049	- .638	.524
Constant	31.996	7.441	-	4.315	.000

* Significant at 0.05 level of significance

Multiple correlation (R) = 0.362. R^2 = 0.131, adjusted R^2 = .111

Constant = 31.996

Standard error of estimate = 10.161

Multiple Linear Regression F – value = 6.350, df_1=5, df2=211, P<0.05

Regression Equation:

$$Y_2' = 31.996+.915x_{12} + .061x_{22}+.040x_3 - .111x_4 - .126x_5$$

Where X_{12} – physics achievement motivation

X_{22}– physics self-esteem

X_3 – visual Learning style

X_4 – Auditory Learning style

X_5 – kinesthetic Learning style

Table – 8 shows, the results of multiple regression of the predictor variables x_{12}, x_{22}, x_3, x_4, and x_5. The multiple linear regression reveals that all the predictor variables together contributed 13.1% to the explained variance of the criterion variable PA (Y_2). The f-value (6.350) of the multiple regression shows that all the predictor variables combined together make statistically significant contribution at the 0.05 level of significance. As can be noted from Table-8, the t-value indicates that x_{12} does contribute to the prediction of y_2 significantly at 0.05 levels of significance.

Generally, according to the result of multiple regression analysis, the majority of the variance in the dependent variable is due to x_{12}

4.3.3 Step-Wise Regression Analysis in PA

Table 9: Result of step-wise regression

Stp no	Variables entered	Unstan.Reg. coef. (B)	Stan. Error of Reg. (SEB)	(Beta)	Multiple		Increase in R^2	F
					R	R^2		
1	X_{12}	.917	.168	.350	.350	.122	-	29.859
2	ALL	-	-	-	.362	.131	0.009	6.350

Multiple correction (R) = 0.350, R^2 =.122, adjusted R^2 = .118

Constant = 28.080

Standard error of estimate = 10.117,

Multiple Linear regression F-value = 29.859, df_1=1, and df_2=216,P<0.05

Regression equation:

$Y'_2 = 28.080 + .917\ x_{12}$

Where X_{12} = physics achievement motivation

Table -9 shows the result of step-wise regression analysis. This analysis indicates the relative contribution of the predictor variables. The predictor variables considered in this analysis are x_{12}, x_{22}, x_3, x_4 and x_5. In the analysis x_{12} is the only variable found to be significant contributor at .05 levels of significance. The proportion of variance accounted for PA (y_2) by x_{12} is 12.2%. The total variance accounted for PA (y_2) by all the predictor variables x_{12}, x_{22}, x_3, x_4 and x_5 was13.1%. That is, the increase of variation in y_2 attributable to x_{22}, x_3, x_4 and x_5 is only 0.9%.

This indicates that the additive effect of the variables x_{22}, x_3, x_4 and x_5 is not significant.

4.4 Intercorelation, Multiple and Step-Wise Regressions among variables in total achievement.

4.4.1 Intercorelation among variables in Total achievement

Table 10: Result of Intercorrelation

Variables	X_1	X_2	X_3	X_4	X_5	Y
AM (X1)	1					
SE (x_2)	.436**	1				
VLS (x_3)	.063	.214**	1			
ALS (x_4)	.117	.195**	0.296**	1		
KLS (x_5)	.000	.248**	0.504**	0.302**	1	
PAL (Y_2)	**.378****	**.234****	**.014**	**- .016**	**- .007**	**1**

**** Significant at the 0.01 level (2-tailed)**

As indicated in Table-10, achievement (criterion variable) is positively and significantly correlated with AM($r=0.378$, $p<0.000$), and SE($R=0.234$, $P<0.000$). The other predictor variables have (VLS positive and ALS and KLS negative) relations with the criterion variable(Y), but not significant. The study therefore confirms that achievement motivation and self-esteem are significant predictors of students' academic achievement at 0.01 significance levels.

4.4.2 Multiple Regression Analysis in Total Achievement

Table 11: Result of Multiple Regression Analysis

variables	Regression coefficient B	Standard error of B (SEB)	Beta	t	p
AM (x_1)	.888	.181	.347	4.865	.000*
SE (x_2)	.189	.147	.095	1.286	.200
VLS (x_3)	-.005	.162	-.002	-.035	.975
ALS (x_4)	- .099	.087	- .078	- 1.144	.254
KLS (x_5)	- .013	.170	- .006	- .078	.938
Constant	27.282	6.935	-	3.934	.000

* Significant at 0.05 level of significance

$R=.394$, $R^2=.155$, adj.$R^2=.135$, standard error of estimate =8.763

Constant=27.282, multiple linear regression f-value=7.724, $df_1=5$, $df_2=211$, $P<0.05$

Regression Equation:

$Y' = 27.282 + .888x_1 + .189x_2 - .005x_3 - .099x_4 - .013x_5$

Where

X_1= Achievement motivation

X_2=Self-Esteem

X3=Visual Learning styles

X4=Auditory Learning Styles

X5=Kinesthetic Learning Styles

Table-11 shows the result of multiple regression analysis of x_1 to x_5 as predictor variables. The multiple linear regression reveals that all the predictor variables together contributed 15.5 percent to the explained variance of the criterion variable. In other words, the predictor variables together contributed 15.5 percent of the explained variance in the academic achievement of the target group. The f-value (7.724) of the multiple regression, as can be seen above, shows all the predictor variables combined together make statistically significant contribution at the .05 levels of significance. The magnitude of standardized regression coefficient can also be presented in descending order based on the significant independent contribution of each predictor variable. As can be seen in Table-11 above, the t-values indicate that x_1 does contribute to the prediction of Y significantly at 0.05 levels of significance. In general, according to the result of multiple regression analysis, the majority of the variance in the criterion variable is due to X_1

4.4.3 Step-Wise Regression Analysis in Total Achievement

Table 12: Result of step-wise regression

Stp no	Variables entered	Unstan.Reg. coef. (B)	Stan. Error of Reg. (SEB)	(Beta)	Multiple		Increase in R^2	F
					R	R^2		
1	X_1	0.962	0.160	.379	.379	.144	-	36.005
2	ALL	-	-	-	.394	.155	0.011	7.724

$R=0.379$, $R^2= 0.144$, adjusted $R^2=0.140$

Standard error of the estimate= 8.739

Multiple Linear Regression f-value=36.505, $df_1=1$, $df_2=215$, $P<0.05$

Constant=27.114

Regression Equation:

$$Y'=27.114 +.962X_1$$

Where X1= Achievement motivation

Table-12 shows the result of step-wise regression analysis. The predictor variables considered in this analysis are X_1, X_2, X_3, X_4 and x_5. In the analysis X_1 is found to be significant at .05 levels of significance. The proportion of variance accounted for Y by X_1 is 14.4 percent. Had the remaining variables (X_2, X3, X4, and X_5) been included in the regression model, the total variance accounted for Y would have been 15. 5 percent. That is, the increase of variation in Y attributable to X_2, x_3, x_4, and X_5 is

only 1.1%. This shows that the additive effect of the variables x_2 to X_5 is very low.

4.5 Percentage Description of Learning styles Preference

Table13: result of Percentage description

VLS	ALS	KLS	Students with more than one preference	TOTAL
16.59%	**44.24%**	**27.65%**	**11.52%**	**100%**

. According to the data obtained from students' response given to learning styles questionnaire, 16.60 % of the students were visual learners, 44.24 % auditory learners and 27.65% kinesthetic learners. The remaining 11.52% of the total students have more than two learning styles preferences. As we can see from the table most of wukro High School students are auditory learners.

CHAPTER FIVE

DISCUSSION

Some research questions were raised in this study in an attempt to investigate whether or not there was difference in achievement motivation, self-esteem, mathematics and physics achievement between WSDP-supported and WSDP-not supported students at Wukro High School; whether achievement motivation, self-esteem and learning styles have relation with students mathematics and physics achievement and to identify the most preferred learning style by students. The discussion part of this study is based on the findings of this research.

5`1 Differences in MAM, PAM, MSE, PSE, MA a between WSDP-supported and non supported

The mean differences in mathematics and physics achievement motivation of the target groups reveal that there is a significant mean difference between the two groups (see Table -1). This result confirms that WSDP-not supported students are greater in mathematics and physics achievement motivation than those supported by WSDP.

This result also confirms that the WSDP-not supported are more motivated to achieve better in mathematics and physics than the WSDP supported students.

Table – 2 shows the mean differences of mathematics self-esteem and physics self-esteem between WSDP-not supported and WSDP supported students. Though the means of mathematics and physics self-esteem of WSDP-not supported students are slightly higher than the WSDP-supported students, the result of the t-test reveals that the differences are not significant. These indicate that there is no significant difference in the level of self-esteem towards mathematics and physics between the WSDP supported and WSDP-not supported students.

The other differences tested using t-test between the target groups are the groups' difference in their mathematics and physics achievement. As it is displayed in Table – 3, Considerable mean difference between WSDP-supported and WSDP-not supported students are observed in both mathematics and physics achievement. The result in Table-3 confirms that the WSDP-not supported students are better achievers in mathematics and physics than the WSDP supported students in Wukro High School. The achievement motivation, mathematics and physics achievement differences displayed in Tables 1 and 3 indicate that students with higher achievement motivation are also significantly higher in school achievement. This finding is in agreement with several research findings carried out in similar area of concern. Kifle (2004) in his research in three high schools in Tigray had found out those students with higher level of achievement motivation score significantly higher in their academic performance.

McClelland (1985) has also revealed that individuals who possess high achievement motivation have the motive to obtain high academic performance and show the need to manipulate their environment.

Bar-Tal (1978) cited in Zenawi (1997) also said on this point that individuals who possess high level of the need to achieve use to exercise different achievement related activities with the expectation of better performance as compared with those who has lower level of the need to achieve. Therefore, from the findings observed in Tables 1 and 3, one may conclude that when achievement motivation is enhanced so does academic achievement. Moreover, the observed result implies that achievement and achievement motivation can be two faces of the same coin, where there is achievement motivation there is academic achievement and vice versa.

Researches finding on the influence of self-esteem in students' school achievement indicate that students who are high in self-esteem are better in their academic achievement.

Bahiru (1999) in his study on self-esteem towards mathematics and language of TTI students in Oromia region has found that students with high self-esteem were better achievers in both subjects. Similarly Solomon (1999) in his research at Sodo High School has also disclosed that students with high self-esteem were better academic achievers.

But in this research, groups with no significant difference in their self-esteem towards mathematics and physics have shown achievement

differences in both mathematics and physics subjects. This phenomenon might have happened because of the self-report used to gather the data, since self-report is exposed to bias, and failure of the target groups to give genuine and true description of their level of self-esteem. Although there was no significant difference between the WSDP supported and WSDP-not supported students in their self-esteem towards mathematics and physics,the mean of the WSDP-not supported students, the better achievers in mathematics and physics, was slightly greater than the mean of WSDP supported students.

5.2 The relationship of achievement motivation, self-esteem and learning styles with mathematic and physics achievement

When determining the magnitude of achievement motivation, self-esteem and learning styles (visual, auditory and kinesthetic) in mathematics and physics achievement the result reveals th at mathematics ac hievement motivation and mathematics self-esteem correlate positively and significantly with mathematics and physics subjects. But the relationships between learning styles (visual, auditory and kinesthetic) and mathematics and physics achievement failed to attend level of significance (see Tables 4 & 7). The positive and significant relationships of mathematics achievement motivation and mathematics self-esteem with mathematics and physics achievement signify the role of achievement motivation and

self-esteem in daily students' activities for scoring better examination results.

The relation found between achievement motivation and school achievement in this study is consistent with other previous findings obtained by other researchers. Desta (2006), in his study of achievement motivations relation to students' academic achievement reported the existence of significant relationship between academic achievement and achievement motivation.

Daniel (1992) also has found a similar result by examining the achievement motivation of the Ethiopian freshman program students at Kotebe teachers training College. His Finding made clear the statistically significant relationship between achievement motivation and students' cumulative grade point average. Newman (1988) also said on this point that the relationship between achievement motivation and various school outcomes seems logical and academic performances are more likely to be affected by achievement motivation. Moreover, Khan, 1969 cited in Girma (1997) said similarly that the correlation between science subjects, social studies, problem solving, arithmetic computation and need to achieve were found to be greater than .20 for male and female students.

The positive and significant relationship between mathematic and physics self-esteem and mathematics and physics achievement (see Tables 4 and

7) also consistent with many research findings of the same area of concern.

According to Shavelson (cited in Solomon, 1999), the more closely particular facets of self-esteem are linked with specific situations, the closer the relationship between self-esteem and behavior in specific situation. Solomon (1999) in his study at Soddo Senior Secondary school also found out that academic self-esteem has a positive relationship with students' school achievement.

Concerning correlation relationship between self-esteem and academic achievement, Watkins and Astilla (1980), on their study of 173 Filipino high school students also reported positive and significant relation between self-esteem and school achievement. They also reported on their study that majority of studies examining the relationship between self-esteem and school achievement ranges from r=0.30 to r=0.45 or low to be $r < 0.25$

The other predictor variables – visual, auditory and kinesthetic learning styles do not have significant relationship with mathematic and physics achievement and to the total achievement. But visual and kinesthetic learning styles have positive relationship with mathematics achievement (see Table – 4) and positive relationship between visual learning style and

physics achievement was observed (see Table – 7). The remaining has negative relationship with both subjects' achievement.

In relation to this finding, Boyle et al. (cited in Assefa (2005) also reported low positive association between students academic performance and learning styles.

According to Marsh and Hadrill (2007) too, one's learning style is the way one tend to learn best. It involves one's preferred way of taking in, organizing and making sense of information. These researchers further said that learning styles do not tell us about persons' ability or intelligence, but they can help us to understand why some tasks seem easier for one than others.

Assefa (2005), in his study of Kolbs learning styles model also disclosed that learning styles have no relationship with students' academic achievement.

The literature in this study also confirms hat learning styles concern with identifying and categorizing the habits and other behavior of individuals as they approach different learning situations rather than how well they complete the task encountered with them (Pask, 1976 and Keefe, 1979).

Table-10 displays relationship of achievement motivation, self-esteem and visual, auditory and kinesthetic learning styles with total achievement of both subjects. This confirms similar positive and significant relationship of achievement motivation and self-esteem with students' achievement as displayed in Tables 4 and 7. In this Table ALS & KLS are proved to have negative and VLS positive relations with total achievement.

5.3 The contribution of predictor variables in predicting mathematics and physics achievement

To investigate the combined effect of the predictor variables and individual variables' contribution to mathematics, physics and total achievement multiple and step-wise regressions were used. The outcomes in Tables 5, 8 and 11 show the linear combination of all the independent variables for the prediction of academic achievement in mathematics (Y_1), physics (Y_2) and total achievement(Y) respectively.

According to the result in Table – 5, the predictor variables (mathematics achievement motivation, mathematics self-esteem and learning styles-visual, auditory and kinesthetic) explain 12.4 percent of the variance in mathematics (Y_1). Here the remaining 87.6 percent variation in mathematics is explained by other independent factors other than the above mentioned predictor factors.

The analysis (in table-6) further discloses that 12.0 percent of the variance in mathematics achievement is accounted for by the linear combination of mathematics achievement motivation (9.5%) and mathematics self-esteem (2.5%). The other independent variables (visual, auditory and kinesthetic learning styles) are found to have very little effect (only 0.4 percent on mathematics achievement). From this result, one may generalize that achievement motivation and self-esteem are the potential predictors of mathematics achievement. The other variables, visual,

auditory and kinesthetic learning styles do not have predictive value to students' mathematics achievement.

Similarly, the result in Table – 8 disclosed that the predictor variables explain 13.1 percent of the variance in physics (Y_2) achievement. Here the remaining 86.9 percent variation in physics is explained by other independent factors which are not considered in this study.

The analysis further reveals that 12.2 percent of the variance in physics achievement is accounted for by achievement motivation. The other independent variables (mathematics self-esteem, visual, auditory and kinesthetic learning styles) are found to have very little effect (0.9 percent on physics achievement). From this result one can also generalize that achievement motivation is the potential predictor of physics achievement (Y_2). The other variables have only 0.9 percent predictive value to students' physics achievement which is very low. (See Table-9)

When we observe the results displayed in Tables 5 and 8, mathematics and physics achievement motivation is significant predictor of both mathematics and physics achievement and contains great portion of the variance accounted for both subjects. But when we see relative contribution of mathematics and physics self-esteem to mathematics and physics achievement, mathematics self-esteem was significant predictor of mathematics achievement where as physics self-esteem was not of physics achievement.

To investigate the contribution of the predictor variables, especially the differences displayed in tables 5 and 8 with regard to self-esteem, further investigation was made on total achievement by considering average value of MAM and PAM, MSE and PSE and MA and PA. The result in Table-11 indicates that achievement motivation was the only significant predictor of the total achievement. Table-12 further displays detail individual predictor variable's contribution to students' total achievement. According to this result achievement motivation(x_1) explain 14.4 percent of the variance accounted for achievement the remaining predictor variables (self-esteem and learning styles-visual, auditory and kinesthetic) together explain only 1.1 percent of the variance accounted for achievement.

With regard to self-esteem, although it was found to be significant predictor to mathematics, it failed to be same to physics and total achievement. Nevertheless, achievement motivation is proved to be significant predictor in all cases. This finding seems to be not in line with many research findings of self-esteem. For instance, Solomon (1999), on his study of influence of self-esteem on students' school achievement, reported that self-esteem was significant predictor of achievement and explained 10.8 percent of the proportion of variance accounted for achievement. But Zenawi (1997) in his study of self-esteem reported that self-esteem was not significant predictor of students' achievement. Williamsburg (2005) in his study of self-esteem also found similar result

and stated that, much of the research examining the relationship between self-esteem and academic achievement has been contradictory.

5.4 Learning styles most preferred by Wukro High School students

According to the result in Table – 13, out of the 217 participants, 96 (44.24 percent) are found to be auditory learners, 60 (27.65 percent) are kinesthetic learners, and 36 (16.59 percent) visual learners. The remaining 25 (11.52 percent) students have shown more than one learning styles preference. This finding confirms that majority of Wukro High School students are auditory learners. This finding is not in line with the estimation of Rourk et al.(2002), who reported that 65% of the world's populations were visual learners, 30% were auditory and only 5 of the population were kinesthetic. The researcher could not find more additional evidences to compare or contrast the present finding because of learning styles research literature is scarce in the Ethiopian research context. Although researcher had done his level best to find further evidence from online sources in the outside world, all attempts were futile.

CHAPTER SIX

SUMMARY, CONCLUTION AND RECOMMENDATIONS

6.1 SUMMARY

The purpose of this study was to see whether or not there is achievement motivation, self-esteem, mathematics and physics achievement differences between WSDP-supported and WSDP-not supported students, whether or not achievement motivation, self-esteem, and learning styles are related with mathematics and physics achievement, to examine the combined and relative predictive power of the predictor variables and to determine the most preferred learning style. To see this, statistical techniques like t-test, correlation matrix, multiple and step-wise regressions were used. The study was conducted on 109 WSDP-supported and 108 WSDP-not supported students. The study has used achievement motivation scale, self-esteem scale and learning styles inventory to measure the predictor variables. Data on mathematics and physics achievement were also obtained from record office of the high school.

Mean difference tests indicated that WSDP-not supported students have high mean score in achievement motivation, mathematics and physics achievement than the WSDP-supported students. Although there were slight mean differences in self-esteem, in favor of WSDP-supported students, the difference between group participants was not statistically significant.

The results of correlation analysis also indicate that achievement motivation and self-esteem have positive and significant relations with mathematics and physics achievements. The learning styles-visual, auditory and kinesthetic have no significant relation with achievement in both subjects.

With regard to the effect of individual variables and combined effect of the variables, the multiple and step-wise regressions analysis reveal the combined and individual effect of the predictor variables in predicting academic achievement. All the variables contribute 12.4 percent and 13.1 percent to the prediction of high school students' mathematics and physics achievement respectively.

6.2 CONCLUSION

The overall conclusion from the analysis is that students who are not supported by WSDP are highly motivated and better academic achievers than the WSDP-supported students in Wukro High School.

The mean differences in self-esteem between the two groups show slight difference in favor of the WSDP-not supported students. But the difference is not significant.

The relation ship between achievement motivation and self-esteem is stronger than between the learning styles and academic achievement. The common relations of learning styles-visual, auditory and kinesthetic with mathematics and physics achievements were quite small and negative (KLS with mathematics and physics and ALS with physics).

This study supports the general hypothesis that achievement motivation and self-esteem are predictors of academic achievement. And learning styles are preferences rather than abilities.

Despite the important implications of this investigation, there are also considerable limitations and weaknesses that may need caution in the interpretation of the findings and may call for further research. First, and most importantly, the findings of the study are limited to only one school and specifically grade 10 students. Therefore, It is possible, even likely, that the outcomes might not be the same if similar cases of different schools and students of different grade levels were included. Second, the data in the present study were collected on self-report bases and self-reports are likely to be biased. Third, the study revealed only group differences in achievement motivation, self-esteem and achievement, but did not indicate why the difference happened between the two groups.
Fourth, the present study considered group differences in mathematics and physics achievements. The result might have given profound understanding about the difference between the groups if achievement of all subjects were considered.

6.3 RECOMMENDATIONS

Based on the review of literature and the results found in this study, the following recommendations are put forward:

1. Different research findings have confirmed that motivated students and students with high self-esteem are better achievers in school. Therefore, specific types of interventions that stress rational and comprehensive counseling and classroom experiences to improve students' academic achievement generally and achievement of the WSDP-supported students specifically is recommended.
2. Further study on these groups' difference in overall school achievement is recommended.
3. Concerned offices, administrators and teachers have to understand the existing achievement differences between WSDP-supported and not supported students and intervene so as to bridge the gape between the two groups
4. The literature and finding of this study confirmed that different students have different learning styles. Therefore, it is recommended that teachers need to implement different teaching methods so as to entertain equally the different learning styles of the students.
5. The WSDP is recommended to consult appropriate professionals to find out the root cause of the problem and come up with a lasting solution.

REFERENCES

Ames,C & Archer,J (1988). Achievement goal in classroom: students learning strategies and motivation process .**Journal of Educational psychology**, 80,260-267.

Ames,C. & Archer, J.(1987).Mothers' beliefs about the role of ability an effort in school learning. **Journal of Educational Psychology**, 79, 409-414.

Ames,C (1992). Classroom: goals,structures and students motivation. **Journal of Educatinal psychology**, 84,261-267.

Anderman,E.M., Griesinnger,J &Westerfield,G. (1998). Motivation and cheating during early adolescence. **Journal of Educational Psychology**, 90, 84-93.

Andrew, B.(1998). Self-esteem: The psychologist. Retrieved on March 25, 2009, from http://www.imperial.ac.uk/chemicalengeenering/commenroom/files/ pstch.Ed.b.pdf/.

Assefa Degebassa (2006). Relationship between Personality, Learning Styles and Academic Achievement of College Students in Oromia Region. Unpublished MA Thesis,AAU.

Atkinson,S. (1964).An instruction to motivation. Prindeton, NJ:Var Nastrand.

Bachman, J. C & O'Malley, P. M. (1997). Self-esteem in young man. A longitudinal of the impact of education and occupational attainment. **Journal of Personality and Social Psychology**, 35, 365-380.

Backman, M. E.(1972). Pattern of Mental Ability: Ethinic, Socio-economic and sex difference. **American Educational Research Journal**, 9, 1-12.

Bahiru Baisa (1999).Gender Differenc in Academic Self-esteem & Success expectation on Maths and Verbal tasks in TTIS of Oromia .Unpublished MA thesis, AAU.

Birch,D.,& Veroff, J.(1966). **Motivation**: S*tudy of Action*. Belmont, California: Brooks Cole Publishing Company.

Bissonnette,B. (2005).Understanding Your Learning Styles.Retrieved on April 3,2009, from hhtp:// www.about us.org/Ldpride.net Liz Boyod.

Blascovich,J & Tomake, J.(1991).Measure of self-esteem. INJ.p,Robinson,P.R.Shaver, & L.S Wrights Man (EDS.).Retrieved on March 27, 2009, from http:www.macsel.edu/ Research/ psychological.

Boumeister, R.F., &Tice, D. M. (1985). Self-esteem and responses to success and failure: subsequent performance and intrinsic motivation. **Journal of personality**, 53,450-460.

Briggs,J. & Moor,R.J.(1993).The process of learning ,printice Hall,London. Retrieved on December 5,2009 from http://www.imperial.ac.uk.

Brophy, J. (1983). Conceptualizing students' motivation. **Journal of Educational Psychology**, 13, 200-215.

Buch,K. & Bartten,S. (2002).Learning styles and training delivery model preference. **Journal of work place learning** 14, 5-10. Retrieved on February 19, 2009 from http://www.eur./.org/material/contrib./2005/santally.htm.

Burns,R. (1982).**Sef-concept Development and Education**. London: Holt, Rinhert and Wiston.

Burten.D. (2007). Psycho Pedagogy and Personalized Learning .Retrieved on February 11,2009 from http://www.informa world.com/ters & conditions.

Buttler,R. (1987).Task involvement and ego involvement properties of evaluation. effect of different feedback condions in motivational perceptions, interest & performance. **Journal of Educational psychology**, 79,474-482.

Buttler,R. & Tucker (1995).Self-esteem, academic achievement and adaptive behavior in African-American children. **The Educational Forum**, 59, 239-243.

Buttler, R. (1999). Information seeking and achievement motivation in middle child-hood and adolescence: the roll of conception of ability. **Mental Psychology**, 35,146-163.

Cab,M. Dunn,R.& Dunn,K. (1991). Teaching students to read through their individual learning styles. Simon & Scuster,inc.

Campbell,R.N.(1984). The new science self-esteem psychology. London: University Press, Inc.

Chapman,A.& Chislett,M.(2005).VAK-Visual, Auditory, Kinesthetic Learning Styles model and free test. Retrieved on March17, 2009, from http://www.business . Com/vak learning stylestest.htm/

Chapman,J.(1988).Learning disabled children's self-concept. **Review of Educational Research**, 58,347-371.

Chiu,L.H.(1997). Development and validation of the school achievement motivation rating scale. **Educational and Psychological Measurement**, 65,512-529

Constantinidous, F. & Baker, S.(2002). Stimulus Modality and verbal learning Performance in normal aging brain and language,82,296-316. Retrieved on April 16,2009 from donclark@ nwlink.com.

Coopersmith,S.(1967). An antecedents of self-esteem. San Francisco: Freeman.

Covington, M.V., & Omelich,C.L.(1984).Task oriented versus competitive learning structure: motivation and performance consequences. **Journal of Educational Psychology**,76,159-168.

Daniel Tefera (1992).Personality types and academic achievement motivation as correlates of college academic performance. Unpublished MA thesis AAU

Desta Ayode (2006). The effect of birth order and on achievement motivation. Unpublished MA thesis, AAU.

Dorothy, C. & Briggs (1975). **Your child's self-esteem**. New York: Dolphin Books, Inc

Duda,J.L & Nicholls, J.G.(1992). Dimentions of achievement motivation in school work and sport. **Journal of Educational psychology**, 84,290-299.

Dressel,L,P. (1976).**Hand book of academic evaluation**. San Francisco: Jossy Bass.

Dweck,C.(1986).Motivational process affecting learning. **American Psychologists**, 41, 1040-1048.

Elliott, A.J. & Harackiewicz, J.M.(1996). Approach and avoidance achievement goals And intrinsic motivation. A mediational analysis. **Journal of Personality and Social Psychology**, 70, 461-475.

Elliot, E.S. & Dweck,C.S.(1988).Goals: An approach to motivation and achievement. **Journal of Personality and Social Psychology**, 54, 5-12.

Elliott, J.G., Huftton, N.,Willis,W. & Illushion, L.(2005).Motivation,Engagement and Educational Performance. Internationa perspective on the contexts for learning.Antony. East Dourne:Antony Rowe Ltd.

Feather,N.T.(1965).The relation of expectation of success to achievement and test anxiety. **Journal of Personality and Social Psychology**, 1,118-126.

Fleming,J.S. & Watts,W.A.(1980).The dimensionality of self-esteem some results for a college sample. **Journal of Personality and Social Psychology,** 39, 921-929.

Ford, B. Obiakor,F. & Patton,J.(1997). Effective Education of African-American Exceptional learners, New Perspective. Retrieved on March 9, 2009, from http://www.Wm.edu/educational/599/05projects/Henery/

Gable,S.L., Elliott,A.J. Church,M.A.(2001).Perceptions of Classroom Environment, Achievement Goals,and Achievement Outcomes. **Journal of Educational Psychology**, 93, 43-54.

Gaskin-Buttler,V.,T.Tucker(1995).Self-esteem, academic achievement and adaptive behaviors in African-American children. **The education forum**,59,234-243.

Gecas, V. (1982). The self-concept. **Annual Review of sociology**, 8,1-13.

Girma Asefa (1997). Differences in academic performance As A Function of Tempr-ature, confort and academic achievement motivation among trainees in Gambella and DebrebirhanTTI. Unpublished MA thesis, AAU.

Gurney,P.W. (1988).Self-esteem in children with special education needs. Retrieved on May 25, 2009, from http://www.wm.edu/education/599/05projects/Henry/ 599/ pdf.

Handy, C.(1994). Theories of learning style. Retrieved on December 22, 2008, from http:// www.masseyac.N21-kinshuk/thesis/.

Hansford,B.C. & Hattie,J.A.(1982). The relationship between self-esteem and achievement. **Review of Educational Research**, 52,123-142.

Harackiewicz,J.M., Barron,K.E.,Carter,S.M.,Lehto,A.T. & Elliott,A.J (1998). Predictors and consequences of achievement goals in the college classroom : maintaining interest and making the grade. **Journal of Personality and Social Psychology**, 73, 1284-1295

Jacobson,E.(1964).The self and the object world. New York: International University Press, Inc.

Jagacinsk, C. M. & Nicholls, J. G. (1987). Competence and in task involvement and ego involvement: The impact social comparison information. **Journal of Educational Psychology** ,79,107-114.

James,W.(1995).The principles of psychology. London: Macmillan and company,Ltd.

Kaplan.A & Midgley,C.(2001).Performance approach goals: Good for what, for Whom, under what circumstance, and at what cost. **Journal of Educational Psychology**,93, 77-86.

Keefe, J. W. (1979). Learning style: an overview in NASSP's. Retrieved on February 22, 2009, from http:// www.newlink.com/-donclark/hrd/.

Kifle G/kirstos (2004).Self-efficacy, academic achievement motivation and study habit. The case of general secondary school students in Tigray . Unpublished MA thesis, AAU.

Klein,S.(1982).**Motivation**: Biosocial approaches . New York: McGraw Hill,inc.

Kratzic, G & Arbuth Nott, K.D.(2006). Perceptual learning proficiency: A test of hypothesis. **Journal of Educational Psychology**, 98,238-246.

Kukla,A. (1978).An attributional theory of choice. **Advances in Experimental Social Psychology**.11,113-144.

Lawerence,D.(1996).Enhancing self-esteem in the classroom. Retrieved on October 17, 2009, from http://www.imperial.ac.uk/

Marsh.H.W.,ParkerJ.W.,& Smith,I.D.(1983). Preadolescent self-concept: its relation to self-concept as inferred by teachers and to academic ability. **British Journal of Educational Psychology**,53,60-78.

Marsh, P. & Hadrill,K.(2007). Tips for successful start to university study. Retrieved on March 21, 2009, from http://www.business.ecu.edu.au/current-students /medical/learning-advisor/learning style.

Marsh,H.W.& Shavelson,R.(1983).Self-concept:Reliability,stability,dimentionality, validity and measurement of change. **Journal of Educational Psychology**, 75, 772-780.

McCarthy,B.(2008).Learning models and characteristics. Retrieved on December 06, 2008 from http:Cconline.org/index.php.

McClelland,D.C. (1985).**Human Motivation**. Glenview.IL: Scot, Foresman.40, 812-825

McComps,B.L.(1984). Process and skills underlying continuing intrinsic motivation to learn: towards a motivation skill training intervention. **Journal of Educational Psychology**, 19, 199-218.

McFarlin,D.B. & Blascovich,J.(1981).Effect of self-esteem and performance feedback on failure affective preferences and cognitive expectations. **Journal of Personality and Social Psychology**,40,521-531.

McFarlin, D. B., Blascovich, J. & Baumeister, R., (1984).On knowing when to quit task Failure, self-esteem, advice, non productive persistence. **Journal of personality**, 52,138-155.

Meece, J.L., Blumenfeld, P.C.& Holly, R.(1988).Students goal orientations and cognitive engagement in classroom activities. **Journal of Educational Psychology,** 80, 514-520.

Mustofa Abdella (2006). Self-efficacy, achievement motivation, attitude and gender difference on students' science performance in Debrebirhan General Secondary School. Unpublished MA thesis, AAU.

Nelson, R, M. (1998). Children and social studies, creative teaching and elementary classroom. (3rd ed.). New York: McGraw Hill, Inc.

Nicholls, J. G. (1984). Achievement motivation: conception of ability, subjective experience, task choice and performance. **Psychological Review**, 91, 328-332.

Nicholls, J. G., Potashnic, M., Cheung, P. C., Thorkildson & Lauer (1989).Individual differences in academic motivation: perceived ability, goals, beliefs and values. **Learning and Individual Differences**,1,63-70.

Newman, Y. (1988). Achievement motivation, factors, and students college outcomes. **Psychological Report**, 62,555-575

Pask, G. (1976). Styles and strategies of learning. **British Journal of Educational Psychology**, 46, 128-134.

Pintrich,P.R., & Degroot, E.V.(1990).Motivational and self-regulated learning components of classroom academic performance. **Journal of Educational Psychology**, 82, 33-40

Pintrich, P.R. (2003). A motivational science perspective on the roll students' motivation in learning and teaching contexts. **Journal of Educational Psychology**, 95, 667-672

Quesada,L.S.(2004).Making the grade easier than you think. Retrieved on January19, 2009 from http:// Ellet.org/classess/freshman/seminar/

Rabideau,S.T.,(2005).effect of achievement motivational on behavior. Rochester Institute of Technology. Retrieved on December 22, 2008, from http://www.personality res.org/papers/rabideau.html.

Riding ,R.J. and Rayner,S. (1998).cognitive styles and learning strategies.Retrieved on April 3,2009, from http://www.about us.org/LdPride.net.

Rourk,B.,Ahmades,collinns,D.Hayman-Abello,s.& Warrinner,E.(2002).Child clinical/pediatric.neuro psychology: some recent advances. **Annual Review of Psychology**, 53,309-315.

Rush,M.C. & Slade,L.A.(1999). Achievement motivation and dynamics of task - difference. **Journal of Personality and Social Psychology**,60,165-172.

Sarasin,L.C.(1998).Learning styles perspective: impact in the classroom, Madison WI: Atward publishing.

Schmitt,C.H. and Brunstein,J.C.(2004). Assessing individual differences in achievement motivation with the implicit association test. **Journal of Research in personality**,38,536-540.

Sharp,J.G.,Byren,J.& Bowler,R.(2007).The trouble with VAK Retrieved on April 6,2009, from http://www. Besajournal.org.uk/journals/2007706/sharp.pdf.

Shine,C.C.(2001).Relation among students' motivation,attitude, learning styles,and achievement. **Journal of Agricultural Education**, 1, 45-52.

Shrauger,J.S., and Sorman,P.B.(1977).Self-evaluations, initial success and failure and improvement as determinants of persistence. **Journal of Consulting and Clinical Psychology**,45,784-795.

Smith.(1996). Accelerated learning in classroom, Network education press.Retrieved On March26, 2009 from http://www highland schools –virtualib.ork.uk/itt/ multiple intelligence/learning-styles-htm/

Simon, R.G., Brown, L., Bush, D.M.& Blyth, D.A.(1978). Self-esteem and achievement of black and white adolescents. **Social Problems**, 26, 86-95.

Solomon Lemma (1999). Self-esteem, sex and family structure as predictors of academic achievement: The case of Sodo Sen. Sec. School. Unpublished MA Thesis, AAU.

Tanner,K.& Allen,D.(2007).Coperative learning in science classroom. Retrieved on April11, 2009, from http://www.business balls.com/hawared gardner multiple intelligence htm.

Theall,M.(2003). Deep-versus surface learning article. Retrived on march 5, 2009, from http://www.thomon.com/routledge.htm.Accessed.

Thomas,F., Hawr, Amit,J.(2007).Using learning styles instruments to enhance students learning. Retrieved on November 15, 2008, from http:// en.wikipedia.org/wiki/ learning styles.

Watkins , B.N.& Astila, E.(1980).Self-esteem and School Achievement of Philpino girls. **Journal of Psychology**, 105, 3-5.

Weiner, B. (1985). Human motivation. New York: Soringer-verlag.

Weiner,B.(1986).An attributional theory of achievement motivation and emotion. **Psychological Review**, 92, 548-552.

Wentzel,K.R.(1991).relations between social competence and academic achievement in early adolescence. **Child Development**, 62, 1066-1072.

Wigfield, A. (1991).Transitions during early adolescence: change in children's domain specific self-perceptions and general self-esteem across the transition to Junior High School. **Developmental Psychology**, 27, 552-565.

Williamsburg, V.A.(2005).Self-esteem and academic achievement in African- American students with learning disability. Retrieved on March 24, 2009, from http://www.Wm.edu/education/599/059 projects/Henry.599

William,J.R., Dawit, W.R.& Hurt, R.W.(1971).Ability, likeability, and motivation of students as they relate to prediction of achievement. **Journal of Educational psychology**, 65,155-158.

Wolters, C. A.(2004). Advancing achievement goal theory: using goal structures and goal orientations to predict students' motivation, cognition and achievement. **Journal of educational psychology**, 96, 236-250.

Zenawi Zerihun (1997).Sex-Role orientation & Academic Achievement Motivation as correlates of High School Academic Performance. Unpublished MA thesis, AAU.

Appendix –A

ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES
DEPARTMENT OF PSYCHOLOGY

Questionnaire to be filled by students

General directions

This questionnaire intends to get first hand information about achievement motivation, self-esteem and learning styles of grade 10 students. The questionnaire consists of four parts. The first part is about your general background information, the second part is mathematics and physics achievement motivation scale, the third part is about your self-esteem towards mathematics and physics, and the fourth part about your learning styles preference. The questionnaires have directions. Please respond to all the items according to the stated directions. Your honest and responsible responses to each item hopefully enable this research to achieve its presumed objectives. I really appreciate your willingness to be part of this study.

Thank you very much for your cooperation

Belay Gizaw

Part one:

Please put (✓) mark or for No 1 and No 2in the space provided. And fill No 3,4,and 5 with appropriate responses.

1. Name _____
2. Sex: Male _____ Female _____
3. Are you assisted by Wukro Social Development Program? Yes _____ No _____
4. Age _____
5. Grade 9 section _____ Grade 10 section _____
6. Roll No. _____

Part-two: Achievement motivation scale
Directions: please read each item carefully if the statement describes what you usually do make a check mark (✓) in appropriate column.

2.1 For mathematics

No		Strongly disagree	Disagree	Agree	Strongly agree
1	I usually spend great effort to accomplish my work				
2	*Usually tackle easy problems first, and I don't worry about the more difficult one				
3	I enjoy learning new things in class				
4	I have a strong desire to excel with mathematics				
5	I prefer working at mathematical problems which challenging so that I can learn new things out of it				
6	*I don't like challenging questions				
7	*If I have not attend my goal and have not done a task well then I usually give up.				
8	*Failure discourages me from trying as hard as possible the next time				
9	Regardless of its level of difficulty, I usually continue to achieve my goal				
10	I often do something to prove that I can do it myself				

***scoring is reversed**

Part-two: Achievement motivation scale

Directions: please read each item carefully if the statement describes what you usually do make a check mark (✓) in appropriate column.

2.2 For physics

No		Strongly disagree	Disagree	Agree	Strongly agree
1	I usually spend great effort to accomplish my physics work				
2	*Usually tackle easy problems first, and I don't worry about the more difficult one				
3	I enjoy learning new things in class				
4	I have a strong desire to excel with physics				
5	I prefer working at physics problems which are challenging so that I can learn new things out of it				
6	*I don't like to solve challenging physics problems				
7	*If I have not attend my goal and have not done a task well then I usually give up.				
8	*Failure discourages me from trying as hard as possible the next time				
9	Regardless of its level of difficulty, I usually continue to achieve my goal				
10	I often do something to prove that I can do it myself				

***scoring is reversed**

Part Three: Self-Esteem Scale

Please first read each item carefully. If the statement describes how you usually feel, make a mark (✓) in the appropriate column.

3.1 For mathematics

No	ITEMS	Not at all true of me	A little true of me	Mostly true of me	Very true of me
1	I am satisfied with my mathematics work				
2	* I am not confident enough in my mathematics problem solving skill				
3	Compare to my classmates, I am good at mathematics				
4	* In mathematics I am inclined to feel that I am a failure				
5	I have never expected myself to fail in mathematics				
6	* I am not initiated to tackle problems more if once I get low mark				
7	Low achievements in previous test encourages me to work harder in order to achieve better				
8	* I don't feel good when I think about mathematics tasks				
9	I am doing the best school work that I can in mathematics				
10	I am proud of my mathematics work				

*** scoring is reversed**

Part Three: Self-Esteem Scale

Please first read each item carefully. If the statement describes how you usually feel, make a mark (✓) in the appropriate column.

3.2 For Physics

No	ITEMS	Not at all true of me	A little true of me	Mostly true of me	Very true of me
1	I am satisfied with my physics work				
2	* I am not confident enough in my physics problem solving skill				
3	Compare to my classmates, I am good at physics				
4	* In physics I am inclined to feel that I am a failure				
5	I have never expected myself to fail in physics				
6	* I am not initiated to tackle problems more if once I get low mark				
7	Low achievements in previous test encourages me to work harder in order to achieve better				
8	* I don't feel good when I think about physics tasks				
9	I feel I am doing the best school work that I can in physics				
10	I am proud of my physics work				

*** scoring is reversed**

Part Four: Learning Styles Inventory

Direction- Please first read each item carefully; if the statement describes what you usually prefer make a mark (✓ in the appropriate column

No	ITEMS	Very little like me	A little like me	Like me	A lot like me
1	I am skillful at designing graphs, charts and other visual displays				
2	I tend to take notes during lecture to review later				
3	I follow oral directions better than written ones				
4	I often prefer to listen to the plasma than read text books				
5	I need to actively participate in any activity to learn how to do it				
6	I usually prefer to stand and move while studying				
7	I need to look at some thing several times before I understand it				
8	I frequently tell jocks and stories to demonstrate points				
9	I would rather conduct my own physics experiment than watch some one else does it				
10	I am usually the life and the soul in group discussion				
11	I can imagine my self doing something before I actually do it				
12	Reading aloud helps me remember my lessons				
13	I have difficulty being still for long period of time				
14	I prefer watching some one perform a skill or a task before I actually try it				
15	I am verbally articulate and enjoy participating in discussions or classroom debate				
16	I remember best by writing things down or drawing pictures and diagrams				
17	I need to watch teachers' facial expressions and body language to fully understand what they mean				
18	I often would rather listen to a lecture than read the material in a text book				
19	I like subjects that have more workout				
20	I am good at figuring out how some thing works				
21	I often talk more than listening				
22	It is easy for me replay scene from plasma in my head				
23	I typically prefer information to be presented using flip-chart or chalkboard				
24	I study well with music in the back ground				
25	I frequently require explanation of diagrams, graphs or maps				

26	I work skillfully with my hands to make or repair things				
27	I understand more by watching the plasma than listening to it				
28	I typically follow written instructions than oral ones				
29	When I study new vocabulary, writing the words several times helps me learn				
30	I like subjects that have work out in more practical ways of doing things				

Appendix -B

ዩኒቨርሲቲ አዲስ አበባ
ቤት ትምህርቲ ድህረ ምረቃ
ዲፓርትመንት ትምህርቲ ሳይኮሎጂ

ብተምሃሮ ዝምላእ መጠይቅ

አጠቃላሲ ሓበሬታ

ናይዚ መጠይቅ ቀንዲ ዕላማ ተምሃሮ አብ ሒሳብን ፊዚክስን ዘለዎም ንውዕኢት ምልዓዓል፣ዓርሲ ኽብሪን ንምምሃር ዝጥቀሙሉም ሜላታትን ብዝምልከት ንዝግበር መዕናዕቲ ኣድላዩ ዝኾነ መረዳእታ ንምእካብ እዩ። በዚ መጠይቅ እዙይ አቢሉ ዝእከብ መረዳእታ መዕናዓይ አካል ንዝተለሞ ዕንዓትን ምርምርን ጥራይ ዝውዕል ይኸውን። ኣብዚ ምጠይቅ እዙይ እትህቦ/ብዮ መረዳእታ ብምሽጥር ዝታሓዝ እንትኸውን ካብቱ ዝምልከቶ ምርምርን መዕናዕትን ወጻእ ድማ ንኻሊእ ዕላማ አይውዕልን። ስለዝኾነ ነዚ መጠይቅ እዚ ኣብ ምምላእ ነጻን ግልዕን ምኻን ከምዘድሊ ክሕብር ይፈቱ።ትኽክል ወይ ድማ ሓሰት እዩ ዝብል መልሲ የለን።ነብሲ ወከፍ ነናይ ባዕሉ መልሲ ክህልዎ ይኽእል እዩ።

ዕላማ እዚ መዕናዕቲ እዙይ ዕዉት ክኸውን ዝኽእል ሕድሕድ መልሲ ወሃባይ ትኽክለኛን ኣብሓቂ ዝተደረኸን መረዳእታ እንተሂቡ ጥራይ እዩ።ንኹሉም ሕቶታት ብቅንዕና ንኽትምልስ/ሲ እናተላበኹ ንእትገብረለይ/ርለይ ሰናይ ምትሕብባር አቀዲመ የመስግን።

እዚ ጥራዝ እዚ አርባዕተ ክፋላት ዝሓዘ እዩ። ስለዚ ኣብ ሕድ ሕድ ክፋል ንዝዋሃቡ መምርሒታት ብጥንቃቀ ንኽተንብቦ/ብዮ ሓደራ ይብል።

ቀዳማይ ክፋል

መምርሒ፦ ስዒበን ንዘለዋ ክፍቲ ቦታታት መልሲ ኣብዘድልዮ ናይ ባዕልኻ/ኺ መልሲ ብምቅማጥ ኣብዝተረፋ ድማ ናይ « ✓» ምልክት ብምቅማጥን መልሲ ሃብ/ቢ።

1. ሽም _____
2. ጾታ ኣንስ ____ ተባዕ _____
3. ዕድመ _____
4. ኣብ 9ይ ክፍሊ ዝነበረካ/ኪ ተራ ቁዕሪ _____
5. ኣብ 9ይ ክፍሊ ዝነበርካዮ/ኪዮ ክፍሊ _____ ኣብ 10ይ ዘለኻ/ኺዮ ክፍሊ _____
6. ኣብ እንዳባ መላኩ ትሕገዝዶ? እወ ይሕገዝ _____ አይሕገዝን _____

መዐቀኒ ስምዒት ንውዕኢት ምልዕዓል

2ይ ክፋል

መምርሒ፡ ነዞም ዝስዕቡ መሉእ ሓሳባት ብዝግባእ ምስእንበብካ/ኪ ብዝስምዓካ/ኪን ብትገብሮ/ሪዮን መሰረት መልሲ ሃብ/ቢ። እቲ ሕቶ መማረጺ ስለዘለዎ አብ እትመርጾ/ዕዮ ክፍቲ ቦታ ናይ «✓» ምልክት ብምግባር መልሲ ሃብ/ቢ

2.1 ንሒሳብ ትምህርቲ

ተራ ቁዕሪ	መሉእ ሓሳባት	ብጣዕሚ አይስምዕማዕን	አይስምዕማዕን	ይስምዕማዕ	ብጣዕሚ ይስምዕማዕ
1	ናይ ሒሳብ ዕዮታተይ ብእዋኑ ንምሥራሕ መብዛሕትኡ ግዜ ዝለዓለ ዓዕሪ ይገብር				
2	መብዛሕትኡ ጊዜ ፎከስቲ ዕዮታት ምስሠራሕኹ አፀገምቲ ዝኾነ ሕቶታት አይግደሸሎምን				
3	አብ ውሽጢ ኽፍሊ ሓደሽቲ ነገራት ንኽመሃር ይመርፅ				
4	ከበድቲ ናይ ሒሳብ ሕቶታት ምሥራሕ አይፈትውን				
5	ሓዱሽ ነገር ንምፍለጥ ስለዝሕግዘኒ ፈታኒ ዝኾነ ናይ ሒሳብ ሕቶታት ምስራሕ እመርፅ				
6	ብሒሳብ ትምህርቲ ፀብለልታ ንምርካብ ብርቱዕ ድልየት አለኒ				
7	ዝውሃበኒ ስራሕ ብዝግባእ እንተዘይሰሪሐን ዕላማታተይ ሸቶኡም ከይወቅዑ እንተተሪፎምን ብዙሕ ጊዜ ሥረሐይ ምቁራፅ ይመርፅ				
8	ሓደ ነገር ባዕለይ ክሠርሖ ከምዝኽእል ካብ ምፍታን ንድሕሪት አይብልን				
9	ብናይ ሒሳብ ፈተና እንተወዲቐ አብቀዳሊ በርቲዐ ከየፅንዕ ይገብረኒ				
10	አፀጋምነቱ ብዘየገድሽ ዕላማታተይ ንምዕዋት ካብምዕዳር ንድሕሪት አይብልን				

መዐቀኒ ስምዒት ንውዕኢት ምልዕዓል

2ይ ክፋል

መምርሒ፡ ነዞም ዝስዕቡ መሉእ ሓሳባት ብዝግባእ ምስእንበብካ/ኪ ብዝስምዓካ/ኪን ብትገብሮ/ሪዮን መሰረት መልሲ ሃብ/ቢ። እቲ ሕቶ መማረጺ ስለዘለዎ አብ እትመርፆ/ዕዮ ክፍቲ ቦታ ናይ «✓» ምልክት ብምግባር መልሲ ሃብ/ቢ

2.2 ንፊዚክስ ትምህርቲ

ተራ ቁዕሪ	መሉእ ሓሳባት	ብጣዕሚ አይስምዕማዕን	አይስምዕማዕን	ይስምዕማዕ	ብጣዕሚ ይስምዕማዕ
1	ናይ ፊዚክስ ዕዮታተይ ብእዋኑ ንምሥራሕ መብዛሕትኡ ግዜ ዝለዓለ ዓዕሪ ይገብር				
2	መብዛሕትኡ ጊዜ ፎከስቲ ዕዮታት ምስሠራሕኹ አፀገምቲ ዝኾነ ሕቶታት አይግደሸሎምን				
3	አብ ውሽጢ ኽፍሊ ሓደሽቲ ነገራት ንኽመሃር ይመርፅ				
4	ከበድቲ ናይ ፊዚክስ ሕቶታት ምሥራሕ አይፈትውኒ				
5	ሓዱሽ ነገር ንምፍለጥ ስለዝሕግዘኒ ፈታኒ ዝኾነ ናይ ፊዚክስ ሕቶታት ምስራሕ እመርፅ				
6	ብፊዚክስ ትምህርቲ ፀብለልታ ንምርካብ ብርቱዕ ድልየት አለኒ				
7	ዝውሃበኒ ስራሕ ብዝግባእ እንተዘይሰሪሐን ዕላማታተይ ሽቶኣም ከይወቅዑ እንተተሪፎምን ብዙሕ ጊዜ ሥረሐይ ምቁራፅ ይመርፅ				
8	ሓደ ነገር ባዕለይ ክሠርሖ ከምዝኽእል ካብ ምፍታን ንድሕሪት አይብልን				
9	ብናይ ፊዚክስ ፈተና እንተወዲቐ አብቀዳሊ በርቲዐ ከየፅንዕ ይገብረኒ				
10	አፀጋምነቱ ብዘየገድሽ ዕላማታተይ ንምዕዋት ካብምዕዳር ንድሕሪት አይብልን				

መዐቀኒ ስምዒት ዓርሲ ክብሪ

3ይ ክፋል

መምርሒ፡ ነዞም ዝስዕቡ መሉእ ሓሳባት ብዝግባእ ምስአንበብካ/ኪ ብዝስምዓካ/ኪን ብትገብሮ/ሪዮን መሰረት መልሲ ሃብ/ቢ። እቲ ሕቶ መማረጺ ስለዘለዎ አብ እትመርፆ/ዕዮ ክፍቲ ቦታ ናይ «✓» ምልክት ብምግባር መልሲ ሃብ/ቢ

3.1 ንሒሳብ ትምህርቲ

ተራ ቁዕሪ	መሉእ ሓሳባት	ፈፂሙ አይገልፀንን	ብዝተወሰነ ይገልፀኒ	መብዛሕትኡ ይገልፀኒ	መሉእ ብመሉእ ይገልፀነ
1	ብሒሳብ ክኢላ ከምዝኾንኩ ይስምዐኒ				
2	ናይሒሳብ ዕዮታተይ ንምስራሕ እኹል ክእለትን ዓርሰእምነት የብለይን				
3	ምስ ደቂ ክፍለይ እንትነፃፀር ብሒሳብ ንፉዕ እየ				
4	ብናይ ሒሳብ ትምህርተይ ፅቡቅ ውፅኢት ክረክብ እኽእል እየ ዝብል ስምዒት የብለይን				
5	ብናይ ሒሳብ ትምህርተይ ክወድቅ እየ ዝብል ትፅቢት ፈፂመ የብለይን				
6	ሓደ ግዘ ትሑት ውፅኢት እንተረኺበ ተወሰኽቲ ሕቶታት ንምስራሕ አይተባባዕን				
7	አብናይ መጀመርታ ፈተናታት ትሑት ውፅኢት እንተረኺበ ንቀፃሊ ዝበለፀ ንኽሰርሕ ይተባባዕ				
8	ብዛዕባ ዕዮታት ቤት ትምህርቲ እንትሓስብ ሕጉስ አይኮንኩን				
9	ካብ ኩሉ ዝበለፀ ብሒሳብ ትምህርቲ ፀብለልታ ዘለዉ ስራሕ እሰርሕ አለኹ ዝብል እምነት አለኒ				
10	ብናይ ሒሳብ ውፅኢተይ ብጣዕሚ እየ ዝኾርዕ				

መዐቀኒ ስምዒት ዓርሲ ክብሪ

3ይ ክፋል

መምርሒ: ነዞም ዝስዕቡ መሉእ ሓሳባት ብዝግባእ ምስአንበብካ/ኪ ብዝስምዓካ/ኪን ብትገብር/ሪዮን መሰረት መልሲ ሃብ/ቢ:: እቲ ሕቶ መማረጺ ስለዘለዎ አብ እትመርዎ/ዕዮ ክፍቲ ቦታ ናይ «✓» ምልክት ብምግባር መልሲ ሃብ/ቢ

3.2 ንፊዚክስ ትምህርቲ

ተራ ቁዕሪ	መሉእ ሓሳባት	ፈዚሙ አይገልፀንን	ብዝተወሰነ ይገልፀኒ	መብዛሕተኡ ይገልፀኒ	መሉእ ብመሉእ ይገልፀነ
1	ብፊዚክስ ክኢላ ከምዝኾንኩ ይስምዐኒ				
2	ናይፊዚክስ ዕዮታተይ ንምስራሕ እኹል ክእለትን ዓርሰእምነት የብለይን				
3	ምስ ደቂ ክፍለይ እንትነፃፀር ብፊዚክስ ንፉዕ እየ				
ሒ4	ብናይ ፊዚክስ ትምህርተይ ዕቡቅ ውዕኢት ክረክብ እኽእል እየ ዝብል ስምዒት የብለይን				
5	ብናይ ፊዚክስ ትምህርተይ ክወድቅ እየ ዝብል ትዕቢት ፈዚመ የብለይን				
6	ሓደ ግዘ ትሑት ውዕኢት እንተረኺበ ተወሰኽቲ ሕቶታት ንምስራሕ አይተባባዕን		✓		
7	አብናይ መጀመርታ ፈተናታት ትሑት ውዕኢት እንተረኺበ ንቀፃሊ ዝበለፀ ንኽሰርሕ ይተባባዕ				
8	ብዛዕባ ዕዮታት ቤት ትምህርቲ እንትሓስብ ሕጉስ አይኮንኩን				
9	ካብ ኩሉ ዝበለፀ ብፊዚክስ ትምህርቲ ፀብለልታ ዘለዎ ስራሕ እሰርሕ አለኹ ዝብል እምነት አለኒ				
10	ብናይ ፊዚክስ ውዕኢተይ ብጣዕሚ እየ ዝኾርዕ				

መዐቀኒ ተምሃሮ ንምምሃር ዝጥቀሙሉም ሜላታት

4ይ ክፋል

መምርሒ፡ ነዞም ዝስዕቡ መሉእ ሓሳባት ብዝግባእ ምስአንበብካ/ኪ ብዝስምዓካ/ኪን ብትገብሮ/ሪዮን መሰረት መልሲ ሃብ/ቢ። እቲ ሕቶ መማረጺ ስለዘለዎ አብ እትመርጻ/ዕዮ ክፍቲ ቦታ ናይ «✓» ምልክት ብምግባር መልሲ ሃብ/ቢ

ተራ ቁዕሪ	መሉእ ሓሳባት	ብጣዕሚ ንዓይ አይመስልን	ቁሩብ ንዓይ ይመስል	ንዓይ ይመስል	ብጣዕሚ ንዓይ ይመስል
1	ቻርትታት፣ስእልታትን ካልኦት ስእላዊ ምስልታትን ናይ ምድላው ክእለት አለኒ				
2	ንምዝካር ንኽጥዕመኒ አብ እዋን ገለባ መዘክር ናይምሓዝ ዝንባለ አለኒ				
3	ብዕሑፍ ካብዝዋሃቡ መምርሒታት ብቃል ዝዋሃቡ መምርሒታት ይመርዕ				
4	መፃሕፍቲ ካብምንባብ ናይ ፕላዝማ ፈነወ ትምህርቲ ምድማዕ ዝበለፀ እፈቱ				
5	አብ ተግባራዊ ሥራሕቲ ንጡፍ ተዋሳኢ ኮይነ ትምህርተይ ምክትታል ዝበለፀ እመርዕ				
6	መብዛሕትኡ ጊዜ አብ እዋን መዕናዕቲ አብ ሓደ ቦታ ኮፍ ካብምባል እናተወሳወስኩ ምዕናዕ እመርዕ				
7	ሓደ ነገር ቅድሚ ምርድአይ ደጋጊመ ክርእዮ አለኒ				
8	ነጥብታት ብዝበለፀ ንምብራህ ብቀልዲን ዛንታታትን አቢልካ ምትሕልላፍ እመርዕ				
9	ናይ ፊዚክስ ፈተነታት ሰብ እንትሰርሑ ካብምርአይ ባዕለይ ምሥራሕ እመርዕ				
10	ንበይንኻ ካብምሥራሕ ብጉጅለ ዝሥርሑ ዕዮታት ዝበለፀ እመርዕ				
11	ሓደ ነገር ቅድሚ ምሥርሓይ አቀዲመ ምሕሳብን ምስትንታንን እፈቱ				
12	ዓው ኢልካ ምንባብ ትምህርተይ ዝበለፀ ንኽርዳእ ይሕግዘኒ				
13	ኣብ ሓደ ቦታ ንነዊሕ እዋን ናይ ምዕናሕ ክእለት የብለይን				
14	ሓደ ሥራሕ ባዕለይ ቅድሚ				

	ምፍታነይ ካልእ ሰብ እንትሠርሑ ምርኣይ ዝበለፀ እመርፅ				
15	ብደረጃ ቤት ትምህርቲ ኮነ አብ ክፍሊ ውሽጢ ዝዳለዉ ትምህርታዊ ምይይጥን ክትዓትን ምስታፍ የሐጉሰኒ				
16	ኮፍ ኢልካ ፀዋታ ካብምርኣይ ባዕለይ እንትፃወት ዝበለፀ የሐጉሰኒ				
17	መማህራን አብ ክፍሊ ውሽጢ እንተምህሩ ዘርእይዎም ዝተፈላለዩ አካላዊ ምንቅስቃሳት ምዕዛብ ትምህርተይ ዝበለፀ ንኽርዳእ ይሕግዘኒ				
18	መብዛሕትኡ ግዘ መፃሕፍቲ ካብምንባብ መምህር እንትገልፅ ምድማፅ እመርፅ				
19	ካብ ዝንበቡ ዓይነታት ትምህርቲ ዝበለፀ ዕዮታት ዝበዝሕዎም ዓይነታት ትምህርቲ እመርፅ				
20	ሓደ ነገር ከመይ ከምዝሥራሕ ናይምግንዛብ ዕቡቅ ክእለት አለኒ				
21	ካብ ምድማፅ ንላዕሊ መብዛሕትኡ ባዕለይ ምዝራብ እመርፅ				
22	አብ ፕላዝማ ዝተሓላለፉ ትምህርትታት ብቀሊሉ ምዝካር እኽል				
23	ትምህርቲ ብመምሃሪ ሓገዝ ተደጊፉ እንትቀርብ ዝበለፀይርደአኒ				
24	መዚቃ እንዳሰማዕኹ እንተዕንዕ ዝበለፀ ይርደአኒ				
25	ብስእሊ ተደጊፉ ዝቀርብ ትምህርቲ ንምርዳእ ስለዘፀግመኒ ደጋጊመ ንመምህረይ እሓትት				
26	አብ ዝሥርሑን ዝዕገኑን ነገራት ዕቡቅ ናይ ኢድ ክእለት አለኒ				
27	አብ ፕላዝማ ዝመሓላለፍ ትምህርቲ ካብ ምድማፅ ብዝበለፀ ብምርኣይ ይርድአኒ				
28	ካብ ናይ ቃል መምርሒታት ንላዕሊ ናይ ዕሑፍ መምርሒታት እመርፅ				
29	ሓደሽቲ ቃላት ደጋጊምካ እናፀሓፍካ ምዕናዕ ቀልጢፈ ንኽርዳእ ይሕግዘኒ				
30	ተግባራዊ ሥራሕትን ግድላትን ዘለዎም ዓይነታት ትምህርቲ ደስ ይብሉኒ				

Appendix-c

Mathematics and Physics results of WSDP supported students

No	Mathematics grade- 9		Mathematics Grade- 10	Physics Grade-9		Physics Grade 10
	1st sem.	2nd sem.	1st sem.	1st sem.	2nd sem.	1st sem.
1	52	56	47	61	63	53
2	54	53	61	52	57	63
3	63	52	76	74	56	48
4	58	49	45	34	37	50
5	62	40	49	54	57	50
6	47	45	46	50	45	42
7	54	55	39	50	53	39
8	70	67	68	86	57	69
9	54	55	71	57	50	62
10	78	64	90	84	65	71
11	51	48	55	67	57	60
12	50	52	55	49	54	56
13	51	36	57	58	54	50
14	79	65	86	62	76	62
15	39	35	58	63	43	65
16	53	49	60	50	47	56
17	47	52	64	59	62	47
18	44	46	41	48	46	48
19	43	53	49	59	53	48
20	49	50	70	48	59	52
21	41	55	40	47	50	52
22	40	49	48	51	52	66
23	72	49	60	63	50	58
24	68	59	65	51	58	53
25	43	49	41	44	44	47
26	49	56	51	57	38	54
27	56	38	62	56	59	45
28	73	47	50	65	56	53
29	36	36	51	41	38	42
30	48	53	52	56	57	60
31	56	56	55	64	56	69
32	62	43	63	73	53	50
33	66	70	66	51	43	60
34	60	45	61	57	50	63
35	61	58	72	63	67	66

	Mathematics grade-9		Mathematics grade-10	Physics grade-9		Physics grade-10
	1st sem.	2nd sem.	1st sem.	1st sem.	2nd sem.	1st sem.
36	64	54	59	58	46	61
37	58	60	44	50	46	44
38	47	59	55	41	47	63
39	63	58	53	37	51	71
40	54	40	51	63	45	50
41	63	57	60	63	67	64
42	44	70	58	52	55	51
43	49	51	60	47	59	60
44	68	56	59	63	48	52
45	54	59	49	63	47	69
46	35	52	74	65	69	70
47	52	55	55	54	54	58
48	53	56	53	61	59	64
49	81	52	60	73	50	57
50	67	66	69	61	74	70
51	77	71	73	61	66	55
52	36	56	56	71	59	66
53	79	50	56	80	56	62
54	77	65	60	68	79	65
55	46	47	50	49	41	51
56	60	47	64	49	45	48
57	45	52	46	50	31	53
58	67	55	51	49	49	42
59	43	48	65	69	45	67
60	69	62	58	55	41	71
61	62	56	79	61	46	63
62	64	46	62	53	45	54
63	55	55	73	72	69	71
64	63	53	77	60	42	61
65	61	58	60	57	47	68
66	52	54	57	45	44	53
67	70	66	85	35	77	78
68	58	65	73	77	79	72
69	57	42	46	53	52	42
70	62	57	63	50	56	55
71	54	46	63	42	40	45

No	Mathematics grade- 9		Mathematics Grade- 10	Physics Grade-9		Physics Grade 10
	1st sem.	2nd sem.	1st sem.	1st sem.	2nd sem.	1st sem.
72	58	43	42	59	58	47
73	79	52	71	72	59	49
74	69	60	52	45	45	45
75	62	62	55	60	50	48
76	68	62	59	65	54	49
77	53	46	50	32	45	48
78	55	51	47	53	63	38
79	58	44	58	52	50	39
80	55	49	34	52	50	33
83	62	40	52	64	50	63
82	64	60	46	66	57	51
83	78	66	58	61	61	62
84	53	50	52	57	52	42
85	56	56	63	53	50	37
86	76	56	88	71	72	61
87	42	51	64	56	51	54
88	68	61	66	64	54	48
89	62	62	52	51	51	53
90	58	49	48	57	56	46
91	54	59	50	54	47	46
92	49	46	57	58	50	30
93	57	46	64	65	50	45
94	59	53	60	63	50	50
95	51	67	60	62	53	29
96	85	77	79	89	81	73
97	64	39	52	60	60	40
98	63	49	51	52	60	35
99	62	51	53	45	50	42
100	51	43	49	59	53	55
101	56	59	42	49	50	22
102	45	39	58	65	56	47
103	64	37	45	62	53	47
104	60	58	59	77	42	32
105	61	48	39	70	51	51
106	48	45	55	63	59	42
107	64	58	71	80	63	54
108	52	67	58	57	46	33
109	66	61	34	64	44	58

WSDP - not supported students

No	Mathematics grade- 9		Mathematics Grade- 10	Physics Grade-9		Physics Grade 10
	1st sem.	2nd sem.	1st sem.	1st sem.	2nd sem.	1st sem.
1	65	63	75	77	71	64
2	61	64	61	71	55	42
3	69	56	63	67	59	37
4	55	49	91	52	50	88
5	68	60	81	74	71	61
6	82	79	81	88	86	86
7	75	59	69	61	53	66
8	63	64	65	46	52	63
9	64	74	63	60	61	67
10	59	69	72	53	69	63
11	61	54	57	46	42	57
12	56	61	65	51	59	54
13	62	55	57	35	37	56
14	61	51	52	56	70	62
15	52	53	49	39	35	44
16	53	60	51	51	54	56
17	60	58	65	42	62	60
18	67	68	68	71	82	79
19	57	53	61	44	43	50
20	95	82	75	92	95	88
21	87	74	73	79	79	78
22	61	63	53	72	53	48
23	64	51	75	52	47	44
24	85	58	85	81	60	69
25	63	47	48	57	61	54
26	73	60	81	76	67	72
27	67	62	51	60	63	51
28	72	53	55	51	54	51
29	99	96	100	98	100	100
30	78	63	66	87	65	87
31	74	42	73	73	68	63
32	92	87	80	95	89	85
33	73	51	55	50	57	63
34	76	54	64	80	61	60
35	75	51	56	76	53	64
36	68	51	45	45	43	66
37	82	60	65	66	58	74
38	73	42	60	45	51	65
39	73	49	67	82	55	59

No	Mathematics grade- 9		Mathematics Grade- 10	Physics Grade-9		Physics Grade 10
	1st sem.	2nd sem.	1st sem.	1st sem.	2nd sem.	1st sem.
40	82	54	33	68	51	57
41	78	46	49	28	16	57
42	75	56	51	76	61	59
43	57	50	57	52	56	58
44	75	60	68	60	53	58
45	76	53	66	53	57	46
46	67	47	60	60	59	61
47	85	64	80	77	63	81
48	47	55	49	60	57	34
49	64	48	45	64	52	29
50	60	44	48	58	56	44
51	70	60	48	67	65	38
52	71	57	60	67	55	56
53	62	43	60	61	55	41
54	96	88	80	93	90	74
55	51	54	69	61	59	47
56	92	81	83	86	68	72
57	63	51	39	50	46	42
58	85	65	83	68	79	74
59	84	75	74	82	85	65
60	60	50	69	55	57	69
61	54	36	54	48	55	53
62	70	57	92	58	66	64
63	83	76	90	78	87	95
64	58	52	55	55	57	57
65	54	40	57	49	53	60
66	42	51	96	35	64	89
67	53	47	47	54	49	50
68	53	53	69	47	50	60
69	42	51	54	35	64	55
70	82	62	94	68	85	83
71	72	57	84	72	84	64
72	64	48	73	50	61	56
72	53	47	62	54	49	54
73	41	54	69	47	51	51
74	69	74	55	63	78	68
75	52	47	53	67	43	64
76	73	53	48	59	55	45