



ADDIS ABABA UNIVERSITY

COLLEGE OF EDUCATION & LANGUAGE STUDIES

SCHOOL OF PSYCHOLOGY

**The Relationship of Academic Motivation, Self-Regulated
Learning and Academic Performance: The Case of Some Schools
in Addis Ababa**

By
Liya Girma

Date October, 2025

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A Thesis Submitted to the School of Psychology in Partial Fulfilment of the
Requirements for the Degree of Master of Arts in Developmental Psychology

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October, 2025

Addis Ababa, Ethiopia

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Declaration

I declare that this thesis, titled The Relationship of Academic Motivation, Self-Regulated Learning and Academic Performance: The Case of Some Schools in Addis Ababa, submitted in partial fulfilment of a master's degree is my own work. All sources have been duly acknowledged and I affirm that it has not been in whole or in part presented to any other institution.

Name _____

Signature _____

Date _____

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List of Abbreviations/Acronyms

AM:	Academic Motivation
Amo:	Amotivation
AMS:	Academic Motivation Scale
ANOVA:	Analysis of Variance
AP:	Academic Performance
A-SRL-S:	Academic Self-Regulated Learning Scale
CFA:	Confirmatory Factor Analysis
EFA:	Exploratory Factor Analysis
EM-Iden:	Extrinsic Motivation-Identified
EM-Intro:	Extrinsic Motivation – Introjected
EM-Reg:	Extrinsic Motivation – External regulation.
IMTA:	Intrinsic Motivation towards Accomplishment
IMTK:	Intrinsic Motivation To Know
IMTS:	Intrinsic Motivation Toward Stimulation
MSLQ:	Motivated Strategies for Learning Questionnaire
SRL:	Self-Regulated Learning
SRLIS:	Self-Regulated Learning Interview Schedule
IM-ID:	Intrinsic Motivation- Interest Driven
UNESCO:	United Nations Educational, Scientific and Cultural Organization
EM-FCO:	Extrinsic Motivation- Future Career Oriented

Abstract

There has been a growing need to understand and tackle the academic underperformance of Ethiopian students in their studies in recent years. Such failures have normally been attributed to many factors including psychological aspects of the students and the quality of academic environments. This study aims to contribute to existing limited body of research by examining the relationship among academic motivation, self-regulated learning, and academic performance within some schools in Addis Ababa, Ethiopia. Concurrent triangulation was ensured through the parallel convergent mixed method research design involving a quantitative analysis which is then supplemented by a qualitative part. 317 sample of students were selected from two high schools in Addis Ababa. Exploratory factor analysis was done to unveil the underlying factor structure of both the academic motivation scale and the academic self-regulated learning scale. A 3-factor model for the AMS and a 7-factor model for the A-SRL-S extracted through the EFA were confirmed through the CFA and additional K-fold cross validation was also carried out. The quantitative analysis found that significant number of participants demonstrated moderate to high level of academic motivation, while self-regulated learning and academic performance were average. The Pearson correlation analysis discovered significant positive correlation amongst the three main variables, while the multiple regression revealed that self-regulated learning explained the variance in academic performance independently and jointly with the unique contribution of academic motivation being minimal. The structural equation modelling showed that self-regulated learning did not mediate the relationship between academic motivation and academic performance in this sample as the positive indirect effect was not significant. It also showed significant direct effect between academic motivation and self-regulated learning though the direct effect of the independent variables on academic performance was not significant. The findings also revealed significant differences in academic motivation and academic performance as a function of grade level, while significant differences in academic motivation and self-regulated learning were also observed across gender and family structure profiles as well as significant differences in academic performance as a function of father's education, mother's education and school type. Significant differences were also found for academic motivation due to age. Through the qualitative analysis, thematic analysis of participants' interview data confirmed some of the findings from the quantitative part and further elaborated that though students were motivated and had some level of self-regulated learning skills, their motivation slightly leaned towards extrinsic motivation and they seemed to lack refined and organised learning strategies. Furthermore, the participants viewed academic motivation, self-regulated learning and academic performance as crucial interrelated variables that influence one another.

Keywords: Academic motivation, Self-regulated Learning, Academic performance, Mixed Method Research

Chapter One

Introduction

This chapter portrays an outline of the basis of the study examining the interplay between academic motivation, self-regulated learning and academic performance. It contains the background, research objectives, scope of the study, significance of the study, and operational definitions.

1.1. Background of the Study

Education plays an important role in cultivating a qualified human who contributes to the society. It successfully assimilates students in to the world by instilling knowledge and skills needed for their survival and betterment of civilization. Education fulfils several important functions in society; it helps individuals foster skills needed to meet their goals and environmental conditions, preparing them for personal and professional pursuits. In doing so, it promotes stability by acquainting people with norms and social values. Education can also improve job prospects and boost economic and personal development (Basu, 2020). As people progress throughout their lifespan education plays a pivotal part in moulding their cognitive development, imparting them skills in critical thinking, problem solving and comprehension of complex concepts (Bourke & Loveridge , 2017).

The foundation of many skills and lifelong learning is laid out during the formative years of early childhood education. It also contributes to social and psychological development of a person as educational institutions offer structured environments that harness interaction and social cooperation. Moral and physical development are also refined through education as lessons in civic education and physical education provide them with impressions of right and wrong and teach them the importance of physical activity and a healthy life style.

In education, academic performance is used as an indicator to evaluate learning and measure understanding in various subjects. Grades and feedbacks assess the progress of academic performance in student's course work based on exams or tests results, assignments, participation and attendance. These feedbacks provide insights into the student's strengths and weaknesses letting them gauge their progress.

Higher academic performance ensures academic success by accumulating knowledge, which in turn ensures future educational and career prospects. Academic success helps improve quality of life through higher socio-economic attainments allowing people to participate in industrialisation, innovative technological advancements, and generally garnering greater life satisfaction and a sense of accomplishment, which, as a result, enhances mental health (Basu, 2020).

Academic problems have been associated with poor study habits, lack of participation or classroom engagement and lack of other such learning strategies (Siahi & Maiyo, 2015). In a broader sense both personal and environmental factors have been found to contribute to academic performance. Kocak et al., (2021), in their meta-analysis, found that a complex interplay of several factors encompassing psychological, socio-economic, socio-demographic, individual characteristics, and learning-teaching strategies influence academic performance. Among the many factors, this paper focuses on motivation and self-regulated learning.

The reason for studying these variables lies in the crucial role they play in the learning process. Academic motivation determines the amount of effort a student puts towards their studies. It serves as the driving force that starts, sustains and guides learning (Schunk, Pintrich, & Meece, 2014). Self-regulated learning involves strategies that allow students to

plan, manage and assess their learning (Zimmerman, 2000). Together, they allow students to exert strategic effort towards their academics which may contribute to their success.

Studies hint the importance of motivation and self-regulated learning in educational settings (Pintrich & De Groot , 1990; Schunk & Zimmerman, 2007; Artino, 2009; Linnenbrink & Pintrich, 2002). Both of these variables are linked to higher academic achievement and better life outcomes. Thus, understanding how these variables interact can give greater insights in to better educational practices.

What makes them unique is their interdependent and dynamic nature. While academic motivation provides the energy for engaging in academic activities, self-regulated learning ensures that it is strategic which is translated in to effective learning and therefore academic success. Additionally, both these variables are teachable and modifiable which signifies that different classroom practices and educational interventions could be designed to improve them. Thus, understanding how these variables interact can give greater insights in to better educational practices.

One of the major problems that students struggle with is lack of academic motivation; this is especially true for adolescents (Gnambs & Hanfstingl , 2015). Students often lack the interest to maintain engagement in classrooms or with their academic activities; they lack effort and the will to persist in the face of academic challenges. Barse (2015) and Greate Schools (2014) have attributed this lack of motivation to academic challenges (students dealing with difficult academic tasks), expectations, and lack of support. On the other hand, Eccles, et al., (1993) has attributed the decline of motivation in adolescence to their academic environments. Adolescent and emerging adult students are at a crucial time in their lives where many changes take place but they also build the foundations of their future during this time.

Academic motivation is vital to maintaining better academic performance which is crucial to their future. Students who are not motivated may struggle to allot the necessary effort their academic work requires often costing them success both academically and life as a whole despite having the required cognitive ability. So cultivating proper levels of motivation allows students to engage better with their academic activities and put forth the necessary effort improving the quality of their academic work, ultimately enhancing their performance.

Another factor that is crucial for academic performance is Self-regulated learning. Twenty first century classrooms have moved to a more learner centered approach from the traditional teacher centered approach in which learners passively take in information. On the contrary, learner centered approach expects students to play as active agents in their learning process by actively participating in the class, brainstorming, solving problems and taking up their learning process with their own initiative. As students grow or develop from childhood in to adolescence or emergent adulthood and progress on to higher grades, academic support from teachers and time teachers spend on the students decreases (Moran 2007). This decline makes maintaining motivation levels and the acquisition of independent learning skills like self-regulated learning crucial. At university level, students are expected to take full responsibility and actively manage their learning process with guidance from instructors. Thus, it becomes imperative that students learn how to learn at a primary level so that these skills like self-regulated learning strategies grow with them and they can be successful in their education throughout their lives.

In Ethiopia, historically, education has been mostly religious with the introduction of secular education in the 1900s. Since then, as part of the initiative to improve literacy rates, many educational institutions have been built, albeit still being of poor quality and insufficient to cover the population needs in comparison to developed countries (Hartjen, Clayton; Priyadarsini, 2012). High dropout rates and low academic performance make

themselves evident as problems that require solutions. World Bank (2022) statistics state that primary school completion rates in Ethiopia was 60.9% for girls and 63.4% for boys. In 2022, only 3.3% of the students who participated in grade 12 examination attained grades high enough to pass to the university (UNESCO, 2024). In 2024 that number only rose to 5.4%. World Bank (2022) also estimated the learning poverty of students who failed to read and understand a text by the age of 10 at 90%.

Despite the adoption of learner centered approach in 1994, Derebssa (2006) showed that teacher centered approach to instruction dominated Ethiopian classrooms. He attributed this to lack of resources, the tradition, lack of expertise on the part of the teacher, and students being disinclined to participate in class. This means the students are ill prepared to take on the compounding responsibilities in their studies that add up as they advance on with their education which lowers their performance (Pokorny & Pokorny, 2005). They are slowly forced to recognise that merely registering facts they have been spoon fed and spewing them out by rote doesn't help much in higher levels and more especially, later on in their lives and work where independent learning is expected, which makes sustaining motivation levels and maintaining self-regulated learning strategies crucial.

The distinctive attributes of students independently taking up their studies in a self-regulated manner begins to emerge in childhood, as early as the third grade, and develops throughout their adolescence and in to their adulthood (Meichenbaum & Biemiller, 1998).

As students are expected to actively and independently manage their own learning as they mature, learning to motivate themselves and developing skills like self-regulated learning become indispensable tools that enable autonomous and effective learning. Simply put, students need self-regulated learning strategies to systematically manage their studies in an organised manner and motivation to help them maintain effort and persistence in the face of

academic challenges. Without these skills and abilities, their attempts to take up their studies independently may not be successful (Tigist,2013).

Since improving academic performance is crucial to how accumulated knowledge and skills are evaluated and measured, and both self-regulated learning and academic motivation are important variables in that endeavour as explained above, thus investigating the relationship among these three variables is essential.

1.2. Statement of the Problem

Academic motivation and self-regulated learning have been recognized as important factors in academic success. Ye Shengyao et al. (2024) indicated that students who are highly motivated tend to be more likely to have better engagement, put more effort in to their academic pursuits, handle challenges better, and stay active in class. Likewise Self-regulated learning allows students to use strategies to manage their learning (Zimmerman,1989). Many students have a difficult time applying such learning strategies in their learning process (Morehead et al., 2016; Rea et al., 2022), while such strategies are absolutely necessary for their academic achievement. It is widely common to attribute academic problems to failure in cognitive abilities. Tigist (2013) indicated that the problem in actuality could be due to lack of knowledge in learning how to learn, that is, in lacking self-regulated learning strategies and deficiency in motivation where students are constantly struggling to maintain their drive to muster up their effort. Both motivation and self-regulated learning support self-initiated effort and techniques used by students to further their education.

A plethora of research exists which investigates academic motivation and self-regulated learning in connection to academic performance. Wu, Li, Zheng and Guo (2020) explored student's motivation in connection to academic performance finding that motivation and more specifically intrinsic motivation significantly influenced the latter. Self-regulated

learning was for instance likewise explored in a meta-analysis study by Dignath, Buettner & Langfeldt (2008) which analysed 48 experimental researches that reported an improvement in academic achievement of students after training on self-regulated learning than in the control groups.

Some research also examines the interactive interplay and joint contribution of academic motivation and self-regulated learning to academic performance. On the other hand, the nuanced dynamics of these relationships remain inadequately researched, like how academic motivation influences self-regulated learning and how the latter may mediate this relationship to academic performance. There is also little research that shows how the different types of motivation relate to the different dimensions of self-regulated learning. There are also some mixed findings in the results which are somewhat contradictory as well as those that suggest that the relationship that exists might be more complex than assumed especially with regards to the relationship between self-regulated learning and academic performance. For example, contrary to the prevailing studies that link self-regulated learning and motivation to academic performance, in a study that examined the connection between self-regulated learning and academic performance with eighty nine middle school students in South Carolina, Juanita (2008) found that the two constructs were not significantly correlated. Matuga (2009) also found similar results reporting that high achieving students scored lower on Self-regulation than low achievers. In another study, on university students, Villavicencio & Bernardo (2013) indicated that self-regulation alone did not predict the students' grades but the joint interaction between self-regulated learning and enjoyment did.

In the national context of Ethiopia, the collective interplay between motivation and self-regulated learning and their intricate relationship likewise rests unexplored. This paper aims to address these concerns. Additionally, there are previously unexplored demographic differences like how school type and parents' educational level could influence academic

motivation and self-regulated learning, so it's interesting to explore the relationship of these variables across different student groups in the academic setting.

1.3. Research Questions

The present study was guided by the following research questions

- I. What are the levels of academic motivation, self-regulated learning and academic performance among the students?
- II. What is the nature of the relationship among academic motivation, self-regulated learning and academic performance?
- III. What proportion of variance do academic motivation and self-regulated learning explain in academic performance jointly and independently?
- IV. Does self-regulated learning mediate the relationship between academic motivation and academic performance?
- V. Are there statistically significant differences in academic motivation, self-regulated learning, and academic performance with respect to demographic variables (e.g.... age, gender, school type, parental education level, family structure, and grade level)?
- VI. What are the school community's perspectives on how students' motivation and self-regulated learning relate to academic performance?

1.4. Objectives of the Study

1.4.1. The general objective of the study

The general objective of this study was to investigate the relationship between academic motivation, self-regulated learning, and academic performance.

1.4.2. The specific objective of the study

1. To assess the levels of academic motivation, self-regulated learning and academic performance among the students
2. To examine the relationship among academic motivation, self regulated learning and academic performance.
3. To assess variance that academic motivation and self-regulated learning explain in academic performance jointly and independently
4. To check if self-regulated learning mediates the relationship between academic motivation and academic performance
5. To test if there are demographic differences in academic motivation self-regulated learning, and academic performance.
6. To explore the school community's perspectives on how students' motivation and self-regulated learning relate to academic performance.

1.5.Scope of the Study

This research focuses on examining the relationship of academic motivation, self-regulated learning and academic performance within two schools (one government and one private) in Addis Ababa, Ethiopia, which was selected as the location of the two high schools found in the study because it is considered as the melting pot of different groups. Also because these schools likewise are more accessible for data collection as there are constraints.

The study targeted a sample of 317 high school students drawn from grades 9 to 12. In line with the questionnaires used, components of self-regulated learning assessed in this study were limited to memory strategy, goal setting, self-evaluation, seeking assistance, environmental structuring, learning responsibility, planning and organizing. Motivation is considered only for academic settings, and finally the study assesses academic performance to see its relation to the independent variables.

1.6. Significance of the Study

The study will add to the existing body of knowledge, first, by validating both scales with Ethiopian cultural and educational contexts in mind making it the first study to do so. Likewise, it also tests self-regulated learning as a mediator between the two other variables, which is also limited in Ethiopian relevant research. Additionally it explores differences in academic motivation, self-regulated learning and academic performance as a function of various demographic variables that have not been sufficiently explored. So over all, it provides empirical evidence on the dynamics between three main variables. For students, the findings can provide an insight in to how deficits in motivation and self-regulated learning can impact academic performance allowing them to focus on cultivating skills that enhance academic performance. It can help educators recognise the factors that contribute to academic success to create effective instructional strategies that promote student learning and performance. Parents can shape the trajectories of their children's academic future using the results of this study by supporting the development of these skills within their children. By understanding that these variables are essential to academic success, educators can incorporate different activities and practices that enhance academic motivation and SRL into their teaching techniques, equipping students with the tools necessary for them to succeed in their education. The information gained can also assist in the formulation of policy that focus on constructs that influence academic outcomes like motivation and self-regulated learning. It could allow policy makers to develop programs and interventions that assist students in building these attributes and skills. The findings can act as a foundation for future research that may explore these variables deeper or other related factors that contribute to academic success broadening the scope of research.

1.7.Operational Definitions

Academic Motivation: It is what drives students to actively take part in their academic activities (Bindawala &Mahato, 2023). This is measured by the Academic Motivation Scale (AMS) developed by Vallerand et al. (1992).

Amotivation: Lacking motive (William &Deci , 1996). It is a subscale of academic motivation measured through the AMS developed by Vallerand et al. (1992).

Self-Regulated learning: The ability of learners to willingly and actively engage with their learning process making use of several learning strategies assessed through Academic Self-Regulated Learning Scale (A-SRL-S) developed by Magno (2010).

Academic performance: Operationalized through students' average grades at the end of the semester.

Chapter Two

Literature Review

2.1 Academic performance: Basic concepts, Assessments, and Theories

2.1.1 Basic concept of Academic performance

According to Wang (2021), academic performance is equated to academic achievement. Chaplin (1959) defined it as a certain degree of competency or attainment in academic work as judged by the teachers. It's a measure of student achievement and progress or learning in several academic subjects. Achievement influences student behaviour. It has significant impact on the student. Marks affect how they view themselves and how they are viewed by others. Their performance is seen as a sign of failure or success and a predictor of how likely they are to succeed in the future and how their parents take pride in them (Symons, 1960). Academic performance is viewed as a standard indicator of progress that encompasses test scores, grades, class participation, and other academic activities. It is a multi-dimensional construct that is influenced by both personal and environmental factors. Costa et.al.(2024) used Bronfenbrenner's ecological systems theory as a guiding framework and identified determinants of student performance or achievement as being due to personal factors and contextual microsystem factors.

Both cognitive and non-cognitive factors are thought to influence academic performance. Cognitive factors are those that are directly involved in understanding and problem solving like reasoning skills or memory and so forth... On the other hand, non-cognitive factors include motivation, self-regulated learning , social skills, etc... The latter are said to be just as necessary as cognitive factors for academic performance if not more (Ayele, 2017). Research shows that for instance, students with good time management and structured learning strategies perform better academically than their peers (Zimmerman, 2002).

With the rise of technology, schools and students alike are progressively using online learning and digital tools like AI to help enhance engagement and access to information in order to improve performance, though overuse and improper use are viewed as hindrances to deep learning (Junco, 2012). Lack of equal access to devices and internet is also a major challenge.

Culture is also another important factor, standards and challenges of academic performance differ in different cultures. The expectations for students and how education is viewed also depend on it (Stevenson & Stigler, 1992). While individualism supports personal performance in certain cultures, collectivist principles in others encourage communal success and familial aspirations.

2.1.2 Assessment of academic performance

The history of academic performance assessment goes back thousands of years. In china, about 2000 years ago talented individuals were spotted for public service and government positions through entrance exams, usually involving essays (China Civilisation Centre, 2007). Teachers in ancient Greece would also question their students to evaluate them. Later on, written assessments began to appear but these were largely based on the discretion of the markers. This made it difficult to maintain consistency as markers disagreed amongst themselves (Brown, 2022). Subsequently, to maintain the consistency of scoring, multiple choice questions were implemented by the 1900s.

Scriven (1967) recognized the difference between formative assessment and summative assessment. Formative assessment is the on-going evaluation of progress in the form of homework, classwork and quizzes. On the other hand, summative assessment refers to the evaluation made at the end of a semester. In addition to these assessments, are standardized tests. As technology advances, use of technology in assessments is also increasing with computer based testing and online learning arrangements taking over.

The validity and reliability of academic performance measures has been somewhat debated. Popham (2001) criticized the traditional grading system and argued that assessments failed to capture crucial aspects of learning like critical thinking , and creativity. On the other hand, many studies indicate that it's a valid and reliable measure while some argue that it has some limitations. Geiser & Santelices (2007), for instance, argue that high school grades are strong predictors of good performance at college level. They view academic performance as a good indicator of a strong capacity to handle cognitive demands. In one study, Norton (1976) indicated that academic performance can indeed hint a student's learning potential. Pascarella & Terenzini (2005) also suggested academic performance as an important metric of academic success. Tengku & Ab Aziz (2020) investigated assessments used by educational institutions and found that they were valid.

The evolution of assessments of academic performance implies that assessments might have moulded and changed learning behaviours and strategies throughout time. The more subjective written essay type of assessments might have needed deep thought and self-driven learning strategies that encourage reflection and critical thinking. While on the other hand, standardised tests are more surface level and inspire rote learning and lack use of reasoning, it may also make it easy for students to cheat.

The study habits and cognitive strategies that are crucial to self-regulated learning shift with differing types of assessments. For instance, giving frequent assessments might allow learners to be more self-regulated as opposed to summative assessments that evaluate them on a semester basis. As students have to be constantly evaluated, they are given feedbacks which can help them improve and make adjustments while reflecting on their academic work giving them repeated chances of planning and monitoring their learning. It also pushes them towards working for their long term goals because frequent assessments as part of the on-going learning process enhance their knowledge and proficiency rather than making them

focus on the short-term reward of passing a one time high stake exam which in turn enhances their ability to delay gratification. It also acts as an external motivator.

2.1.3 Theories of academic performance

Bhat and Bhardwaj (2014) cite that the term "performance" typically denotes the students' learning outcomes. This outcome alters the pupils' behavioural patterns as a result of learning in various subjects. Students' learning has an impact on their cognitive, affective, and psychomotor domains. He posits that learning does not simultaneously progress to the same degree across all three areas.

William (1998), in his theory, posits that poor academic performance is indicated by poor academic practices such as inattentiveness during class, or students' failure to participate and ask questions or study habits all of which can be a sign of lack of self-regulation.

The Achievement goal theory first developed by Ames & Nicholls (1984) indicates that how students approach their achievement goals influences how students approach their studies, how much effort they put out, and how they respond to obstacles when it comes to academic success. There are two primary achievement goals, namely, mastery goals and performance goals. In mastery goal the primary aim is to master or grasp the material fully, while in performance goals the aim is to show off competence. The theory has come a long way since then in Elliot and McGregor (2001) it was further expanded. This theory categorizes achievement goals into two dimensions, namely, goal content and goal orientation. In goal contents are mastery goals and performance goals. Then in goal orientation is approach goals and avoidance goals. Then the theory goes on to combine these two dimensions, the first being mastery-approach goals followed by mastery-avoidance goals, performance approach goals, and performance avoidance goals.

The first theory illustrates that learning affects cognitive, emotional, and physical domains, but not all areas progress equally. The second one links poor academic performance to negative classroom behaviours. The third stipulates that academic performance of students has two main aims for the learner. The first is simply to understand the material and become an expert at it and the second is to demonstrate superior competence compared to others. The first is associated with deep learning and intrinsic motivation while the later may lead to superficial learning as the learner focuses on scoring better grades than others rather than understanding the material.

In this particular study, the theory of William (1998) for instance implies that student's poor classroom practices could be considered a component of lack of self-regulated learning. In the Ames & Nicholls (1984) goal achievement theory meanwhile, students with goal mastery may be more likely to engage in long term effort which requires self-discipline/ regulation and intrinsic motivation towards grasping the subject matter. Likewise, since students who engage in performance goals are geared towards being as competent as others and attaining short term rewards like grades and scoring they may be both intrinsically and extrinsically motivated.

2.2 Academic Motivation: Basic Concepts, Assessments , and Theories

2.2.1 Basic concepts of Academic Motivation

Motivation is an important aspect of accomplishments and life in general (Norboeva, 2023). People need motivation to stay fuelled and keep going in their daily lives. Without it, they are unable to muster up the energy that they need to carry on or find it difficult to direct the depleting and fleeting energy they may have. As a word, it's rooted in the Latin verb "movere" which is defined as "to move" (Brehm, 2014). Motivation is defined in many ways. Pittman (1998) defined it as what fuels behaviour, directing organisms to achieve whatever

moved them to act. Likewise, Brehm (2014) defined it as the inner drive that entices people to pursue behaviours aimed at achieving specific goals.

Historically, attempts to understand what moves a person to act, though not studied systematically and scientifically, goes back to the ancient times. Ancient philosophers pondered over such questions and offered their thoughts on it. Plato thought that people's actions are motivated by the struggle between the elements of the soul, while Aristotle, for instance, thought that people are motivated by the desire to achieve the highest good. Other stoics also posited that reason should be the greatest motivator. On the other hand, Epicurus saw pleasure as the primary motivator. Christian philosophers, in the middle ages, factored in the conflict between God's will and worldly desires. These early ideas laid the foundation and acted as an inspiration for the modern theories of motivation. Psychologists of the 19th and 20th centuries proposed that instincts, will, reinforcements, needs or drives explained what pushed people to behave in one way or the other (Heckhausen, 2013). In current times, the study of motivation takes cognitive, social, biological, and neuro-scientific perspectives in to consideration.

Motivation as a process is conceptualised through stages and components. Arnold et al (1991) (as cited in Armstrong, 2006) pointed out three components and these are effort, persistence, and direction. These components refer to the exertion, perseverance, and goals of the individual. The stages of motivation generally extend from the initial phase where desires and needs are triggered through goal setting and the striving phases involved in order to reach those goals to achievement. (Fiske et al., 2012). Motivation is further classified by types based on underlying factors moving them, the duration they cover, who benefits from them and the goals they hope to attain. Based on underlying factors moving them, which is the scope of this research, motivation is mainly classified in to intrinsic and extrinsic motivation (Silverthorne, 2005). Intrinsic motivation is basically when internal factors are influencing

the individual, meaning the motivation arises internally. It is usually when the individual is interested in the activity itself rather than the outcome. On the other hand, with extrinsic motivation, it is external factors that drive the person to act. In this case, the person is usually interested in the external rewards attached to the end result of the activity (Deci & Ryan, 1985, as cited in Vellerand, 1992).

Developmentally speaking, it is supposed that motivation isn't static. According to Heckhausen (2013) motivation is dynamic and both interacts with and shapes development. As people develop, their infancy and toddlerhood is characterized by little to no control and lack of independence; but as they grow older, their capacity to handle and control their environment increases and they also learn the ability to set goals and appraise their accomplishments. This process enhances and shapes their motivation, as greater control and success rate determine motivation levels. So individuals begin to assess their abilities and their motivation is moulded by such limits. During this period and in childhood, caregivers and parents influence the development of motivation. As the individual reaches school age, their academic performance and social influence is factored in to this dynamic. Success or failure may trigger feelings of pride or shame and such emotional cycles have their own impact on motivation. In adolescence and adulthood, assuming the individual is attaining their developmental milestones, they experience greater independence, and this increased sense of control boosts self-efficacy which increases motivation. This in turn impacts the direction of their life trajectory. Finally, in old age, their sense of control declines affecting their motivation with them some times resorting to shifting their attention on other things (Heckhausen, 2013).

Academic motivation is defined as states that drive students to actively take part in their academic activities (Bindawala & Mahato, 2023). According to Fuertes et al., (2023) academic motivation is the element that affects the effort, perseverance and direction of students'

actions with regards to their academic activities. Academic motivation allows students to actively engage in their studies and exert the necessary effort toward their academic activities. Intrinsically motivated students take up their learning out of natural enjoyment, interest or the desire to master the subject which contributes to their academic performance. Extrinsically motivated students are more interested in the external rewards attached to the outcome rather than enjoying the process. On the contrary, amotivated students exhibit less motivation and are as a whole demotivated (Mutweleli, 2014).

2.2.2. Assessments of Academic Motivation

Assessment of motivation allows researchers to measure, identify and comprehend it as a construct. Academic motivation has been assessed in many ways and different instruments have been developed for the purpose. The most commonly used way of measuring it is through self-report scales and questionnaires. These assessments let researchers assess the different dimensions of motivation through direct feedback from students. One such instrument is the Academic Motivation Scale (AMS) by Vallerand et al. (1992). The tool is based on the Self Determination Theory and it assesses motivation through seven subscales measuring intrinsic motivation, extrinsic motivation, and amotivation. The seven subscales are intrinsic motivation-to know , intrinsic motivation- toward accomplishments, intrinsic motivation – to experience stimulation , extrinsic motivation-identified , extrinsic motivation-introjected, extrinsic motivation-external regulation, and amotivation.

The Motivated Strategies for Learning Questionnaire (MSLQ), developed by Pintrich, Smith, Gracia, and McKeachie (1991) is another such scale which assesses the different dimensions of motivation. This scale originally had 81 items assessing educational motivation, cognitive and metacognitive strategies as well as learning strategies.

There is also the Intrinsic Motivation Inventory (IMI), a 45 itemed scale, developed by Ryan & Deci (2000), with seven subscales which measures intrinsic motivation. It has four

other versions: a 22 item version with four subscales, a 9 item version with three subscales, a 25 item version with three subscales and a 29 item version with five subscales.

Another type of assessment used to measure the construct is observation. Researchers observe the students engaging in academic related activities within or outside of the classroom and their interest, effort and persistence is recorded.

2.2.3. Theories/models of Academic Motivation

Theories of motivation are generally classified as content theories, which are generally the theories that see motivation as arising from needs and drives, and process theories, which are more interested in discussing the psychological processes of motivation. Some like Armstrong (2006) classifies the theories of motivation in to three seeing reinforcement theories like operant conditioning as instrumentality theories and yet others classify motivational theories as physiological and cognitive (Sanderson & Huffman, 2019).

Although interest in the topic of motivation has been around for ages as indicated above, the first systematically studied theories arose around the mid 20th century. One major content theory is for instance that of Maslow (1945). His hierarchy of needs details the order of five basic human needs starting from physiological needs to those at the top of the pyramid like esteem needs and self-actualisation. He posits that it is these needs that motivate people in to action. Another content theory is The Drive Reduction Theory by Hull (1952). This theory postulates that humans are driven by the motivation to satisfy a need. Armstrong (2006) lists Expectancy Theory, Goal Theory , and Equity Theory as the major process theories of motivation. In Expectancy theory, people are claimed to be motivated by the nature of the outcome of their actions or their belief that they will succeed. The more desirable the outcome the more motivated the person is. On the other hand, Goal Theory claims that setting goals acts as a motivator. Setting achievable, specific, measureable goals allows individuals

to strive towards a clear end. Equity theory states that people see the reasonableness of the outcome of their actions as a motivating factor (Armstrong, 2006). In contrast another theory of motivation is the Self Determination Theory by Ryan & Deci (2000). This theory divides motivation in to intrinsic motivation and extrinsic motivation and adds amotivation positing that motivation happens as a continuum from less autonomous forms to more autonomous forms of motivation which it weighs more than the former. This theory states that people feel more motivated if they feel autonomous, competent and connected (Brehm, 2014)

2.3. Self-Regulated Learning : Basic Concepts , Assessments , and Theories/models

2.3.1. Basic Concepts of Self-Regulated Learning

Self-regulated learning has been thought of as a sought for quality throughout history which has its roots in ideas of self-control (Reid, 1993). Self-regulated learning refers to the proactive self-initiated effort that students put in to their learning experiences. It is the way students plan, monitor and organize their studies transforming their mental abilities in to task related skills (Zimmerman, 2001).

Awareness of self-thought process, strategic activity and motivation are key in self-regulated learning. Self-thought process or metacognition involves conscious control over one's cognitive processes (Ayele, 2017). It has two components: metacognitive awareness and metacognitive skills. Strategic activity comprises action taken to plan, monitor, and self-evaluate while motivation is what drives one to do something. Successful learners use self-regulated learning to regulate their learning process and monitor their strategies to accomplish a task effectively and efficiently. Self-regulated learners actively use different strategies when learning, they plan, self-inspect, and self-evaluate constantly as they learn which allows them to create a conducive environment for learning (Walters, 2003).

Additionally, self-regulated learners manage their time and effort, structure their environment and seek assistance when in need, all of which significantly contribute to academic success (Nevgi, 2002; Somtsewu, 2008, as cited in Ayele, 2017). In other words, effective self-regulators are able to adapt their strategies to achieve their learning goals.

2.3.2. Assessments of Self-Regulated Learning

Self-regulated learning, as an ever evolving area of research has been assessed in various ways through self-report questionnaires and scales, observations, learning analytics and trace data and lastly peer/teacher assessments. One of the most widely used self-report measures is The Motivated Strategies for Learning Questionnaire (MSLQ) by Pintrich & De Groot, (1990) , discussed above, which measures students' motivation and cognitive strategies. Another is The Self-Regulated Learning Interview Schedule (SRLIS) by (Zimmerman & Martinez-Pons, 1986). Magno (2010) also developed a self-report tool to measure self-regulated learning called the Academic Self-Regulated Learning Scale (A-SRL-S). This is a 54 item tool is classified in to seven factors of self-regulated learning, namely, memory strategy, goal setting, self-evaluation, seeking assistance, environmental structuring, learning responsibility, planning and organizing respectively.

Winne & Hadwin (1998), on the other hand, suggest assessment of self-regulated learning requires observation and that observational techniques capture the construct better. Micro-analyses were used by Cleary and Callan (2017) and trace data by (Järvelä et al., 2019). Azevedo & Cromley (2004) used learning analytics to assess the part that self-regulated learning plays in online learning. Despite the many ways the construct has been assessed, capturing all the aspects of Self-regulated learning as a multifaceted construct that involves several components can be somewhat challenging.

2.3.3. Theories/ Models of Self-Regulated Learning

According to Panadero (2017), SRL models typically include processes such as goal setting, strategic planning, self-monitoring, and self-reflection. Zimmerman (2002) depicts self-regulated learning as a dynamic process in which students continuously monitor their own progress, set goals and regulate strategies they use in their learning process. His model typically classifies self-regulated learning in to three cyclical phases. These phases are the forethought phases in which learners assess the tasks they are met with. The performance phase, in which they manage their time, monitor their progress and structure their environment and lastly the self-reflection phase, in which students make self-evaluations and judgements on their performance. The cyclical phase modelling is shared by the other models of Self-regulated learning (Winne & Hadwin, 1998; Pintrich, 2000; Zimmerman, 2000). The models of (Puustinen & Pulkkinen, 2001), for instance, also share this cyclic element but the phases are classified as the preparatory, performance, and appraisal phases.

The common elements in these theories are the cyclical nature of the phases, and the dynamic process of self-regulated learning where learners continuously plan out goals, monitor their progress, and reflect to make adjustments to improve their performance. Although the terminology differs, the fundamental idea within these models is the same.

2.4. Review of Empirical Studies on Relations among Academic Motivation, Self-Regulated Learning, Academic Performance.

2.4.1. Review of Empirical Studies on the Relations between Academic Motivation and Academic Performance

Several studies have explored and demonstrated the link that academic motivation and academic performance might have (Athirathan, 2025). Mutweleli (2014), a research which inspired the current study, tested the predictive relationship of academic motivation, self-regulated learning on academic performance and more specifically it checked which type of

motivation and domain of self-regulated learning contributed more to academic performance. The study involved a sample of 938 students from 10 public high schools in Kenya. One of the hypothesis stated that there is a relationship between academic motivation and academic performance and the other, that academic motivation along with self-regulated learning predicted academic performance. Pearson correlation and multiple regression were used as analyses. The researcher found that there was a significant relationship between motivation and academic performance. Moreover the findings exposed that from the different types of motivation, intrinsic motivation – toward accomplishment showed the greatest predictive power on academic performance.

Despite the fact that the (Mutweleli, 2014) study found significant relationships, it only focused on students from public high schools. So comparisons between different types of schools (government vs private), an endeavour that this present study has taken up, can be informative. Moreover, the study despite being done in Kenya, a developing country, it would be interesting to explore what results will be obtained in Ethiopia. Additionally, the study did not look at the relationship of academic motivation and self-regulated learning.

On the contrary, a study by Cetin (2015) done on university students in the USA with a sample of 166 university students investigated whether or not academic motivation and SRL predicted academic performance as well as their respective relationships. They used Pearson correlation and regression analysis to test the relationships and predictive power of the variables respectively. They were also checking the relationships of academic performance to the different types of motivation and self-regulated learning. The results showed that academic motivation was not correlated to academic performance nor did it predict GPA. They attributed this finding to be the result of other factors that might contribute to performance.

In another study Bin Abdulrahman, et al. (2023) examined the relationship between motivation and academic performance within medical students in Saudi Arabia. Their sample consisted of 362 students. Like the first study findings showed that though levels of motivation was high in medical the students examined it was not was not correlated to academic performance.

In yet another study in Canada, with a sample of 1428 high school students Karsenti & Thibert(1995), using Pearson correlation analysis, concluded that motivation, more specifically amotivation was correlated to academic performance.

In Ethiopia, similar to the Kenya paper, a study on a sample of 115 students from two high schools in Addis Ababa that wanted to investigate the link between academic motivation and academic performance found that the level of motivation in those specific students varied in that only 33 % were highly motivated which is consistent with the idea that adolescents have low motivation to learn. The study also found that the two variables were somewhat positively correlated Ayele (2020). Though this study was in Ethiopia and found a positive correlation, the study was conducted on students from grades nine and ten only while the present study found it interesting to look at this relationship within adolescents and emergent adults from grades 9 to 12.

Other studies also hint that the relationship between academic motivation and academic performance may not be so direct and that it was mediated by other factors which included self-regulated learning (Paganin et al., 2024; Chen et al.,2024; Kusurkar.2013).

2.4.2 Review of Empirical Studies on Relations between Self-Regulated Learning and Academic Performance

Research has shown that self-regulated learning is related to academic performance. In a longitudinal study (Zimmerman & Schunk, 2011) investigated self-regulated learning and

academic performance with 422 grade four to grade 12 students in the US using surveys and structured interviews that assessed self-regulated learning strategies. Findings showed that those who exhibited higher self-regulated learning performed better academically showing a strong correlation of ($r = 0.53$). Järvelä & Renninger (2017), in another longitudinal study with a sample of 182 university students, which followed students over the course of one semester corroborated the previous study.

In contrast, Loong (2012), in a study investigating the effects of self-regulated learning strategies on Mathematics performance students in Malaysia. The study had two groups of international students with 58 in one group in the first semester the second group had 18 students in their second and third semesters. It surprisingly found that Mathematics performance was not predicted by self-regulated learning skills. Similar findings were confirmed by Matuga (2009) in a study that investigated goal orientation, self-regulation and academic achievement of online university students. It showed that low performers had the highest scores on self-regulation.

In Ethiopia some studies have explored the relationship between self-regulated learning and Academic performance. Tigist (2013), a correlational study that focused on 477 students from 5 schools in Hawassa Ethiopia investigated SRL in relation to parenting styles and academic performance and found that self-regulated learning was related to academic performance to a small extent. Teffera, et al (2022) also found that self-regulated learning predicted perceived learning gains in a sample of 1142 undergraduate university students.

2.4.3. Review of Empirical Studies on Relations between Academic Motivation and Self-Regulated Learning

Despite the fact that there are numerous research papers on motivation and self-regulated learning individually or their joint contribution to academic performance. Research focusing

on the relationship between motivation and self-regulated learning is relatively somewhat limited. Cetin (2015) who investigated academic motivation and self-regulated learning as predictors of academic performance in 166 university students found that academic motivation was positively correlated to self-regulated learning meaning that the students who were motivated showed better self-regulated learning and in turn performed better in school.

In another study in the USA, Ahmed (2017) investigated whether or not three motivational variables predicted three self-regulated learning strategies on a sample of 5245 students aged 15. The results revealed that the motivational variables did indeed predict the three self-regulated learning strategies but that not one of the first variables showed greater influence than the other on later variables.

Gracia & Pintrich (1991) constructed a model of the link between self efficacy, intrinsic motivation and self regulated learning through structural equation modelling with a sample of 367 college students finding that intrinsic motivation influenced self-regulated learning.

Bindwala & Mahato (2023) also explored the relationship between academic motivation and self-regulated learning with a sample of 300 students that consisted of both college and high school students aged 14 to 23. They used Pearson correlation and determined that though the overall score of academic motivation did not correlate with that of self-regulated learning. The specific types of academic motivation correlated with the dimensions of self-regulated learning leading them to conclude that there is a relationship.

In Ethiopian context, the researcher was unable to find studies that specifically explore the relationship between academic motivation and self-regulated learning though only one related study was identified which found positive correlation between motivational beliefs and cognitive and metacognitive strategies (Abdala & Alemu, 2023).

2.5 Differences in Academic Motivation, Self-Regulated Learning , and Academic Performance as a Function of Demographic Variables.

2.5.1 Differences in Academic Motivation, Self-Regulated Learning and Academic Performance as a Function of Age

Research acknowledges that young children are often naturally lively, curious and interested in what's around them (Ryan & Deci, 2000). So their motivation at that age is mostly internal and arises out of natural enjoyment though they can also be induced in to action with external rewards. Evidence suggests that motivation towards their academics declines in older children and adolescence (Eccles & Midgley, 1989). According to Anderman et al.(1998), though this decline was initially credited to the physical and psychological changes that take place at puberty, it has been contested by research showing that its more related to their academic environment. This decline then slows down and reverts by college age and further in to adulthood.

Contrary to this, Momanyi, Too & Simiyu (2015) investigated how age related to performance and academic motivation with a sample of 489 high school students finding that age had no effect on academic motivation.

On the other hand another study by Becirovic & Becirovic (2017) with a sample containing 210 students (10, 14, and 18 year olds), found that motivation levels decreased as the age of the students increased, with students aged 10 having the highest levels of motivation.

Research demonstrates that as people develop they become better self-regulated learners. Zimmerman (2002) summarized that children who initially lack meta cognitive awareness increasingly develop it as they go through the lifespan. He suggested that self-regulated learning strategies are acquired in adolescence and refined in adulthood. Schunk & Ertmer (2000), in a study that sampled 150 students, grades 6 to 12 examining the relationship between self-regulation and academic achievement revealed that older students showed

greater self-regulation with managing their time and setting goals than did the younger students.

Some studies also show students' academic performance improves with age (Shallice & Burgess, 1996). As there is still on-going development in executive function and areas related to memory, attention, and cognitive flexibility, younger students may have lower performance than older students. As they grow older and their cognitive development matures, their academic performance improves especially in subjects that require critical thinking and problem solving. Urruticoechea et al. (2021) reviewed 21 research articles from 24 countries finding that older children in the same cohort performed better cognitively and had lower repetition rates. Conversely, other researchers found contrary results showing that older students performed lower than younger students Goñi et al. (2018). Academic performance could decrease as students grow older because of the presence of changes associated with adolescence that divert their time and attention away from their studies.

2.5.2 Differences in Academic Motivation, Self -Regulated Learning and Academic Performance as a Function of Gender

Some level of gender differences were indicated in studies of motivation. In one meta-analysis study that looked at how gender related to academic motivation, they found that males showed greater motivation than females (Turhan,2020).

In another study Naz, Shah, & Qayum (2020) investigated gender differences with a sample consisting of 162 students through stratified random sampling in Pakistan and found that males students were more intrinsically motivated. Contrary to this however, another research reported that females are more intrinsically motivated than males (Vecchione, Alessandri & Marsicano, 2014)

Gender differences were also observed for self-regulated learning with females showing more strategies than males (Zimmerman & Martinez-Pons, 1989). On the contrary, in Ethiopia, a study done with 680 participants from grades 5 to 8 revealed that males displayed more self-regulation (Habte, 1997). Similarly Gemed (1996) observed significant gender differences in favour of males.

In terms of gender, academic performance varies across different subjects. Lynn & Irwing (2004) reported that boys tend to perform well on mathematics and science while girls did better on language related subjects. Further studies observed that boys excelled in spatial and analytical tasks while girls showed better conscientiousness in their academics. This could explain why boys perform better in maths and girls in writing and reading (Legewie & DiPrete, 2014; Hyde, 2005).

2.5.3. Differences in Academic Motivation, Self-Regulated Learning and Academic Performance as a Function of School Type

There is a scarcity of research that studies how school type impacts academic motivation and self-regulated learning, though what can be inferred from existing literature is that as private schools have more resources they are able to provide an individualized learning environment that assists the development of academic motivation and self-regulated learning in students. The more structured and rigorous academic environments in these schools emphasize academic excellence and the pressure to meet high expectations which may push students to cultivate skills like self-regulation (Perry et al., 2016). Motivation is also greatly assisted by this.

In one study, Sengupta & Guchhait (2024) found that study environment mattered in terms of academic motivation. They found that school and study environments that allowed for better resources and private tuition had higher levels of motivation.

Conversely, a cross-sectional study done on a sample of 3049 sample of students, used ex post facto design to examine if school type matters in motivation. They found that students from public educational institutions reported greater levels of motivation (Exposito-Lopez et al.,2023).

On the other hand, public or government schools may face problems related to poverty which include instability at home, with food and lack of extracurricular enrichment programs that foster self-regulation skills (Walton & Cohen, 2011). However, according to Zimmerman (2002) even students in public school can develop strong self-regulated learning skills provided that they have structured environments and supportive teachers.

In terms of academic performance, private schools generally perform higher than public schools. Chubb & Moe (1990) attributed this to greater access to academic resources, lower student teacher ratios, and better parental involvement. In one study that assessed 240 students from Nigeria for instance found that private school students performed better than their peers from non-private schools (Adeyemi, 2014).

2.5.4. Differences in Academic Motivation, Self-Regulated Learning and Academic Performance as a Function of Parental Education

Children of parents with lower education are more likely to face economic problems and this is likely to create more stressful and less encouraging environment for their children, while parents with higher educational attainments are more likely to create encouraging environments for their children, which promotes greater motivation. Hidayatullah & Csikos (2023), in their research , found that parental education level was related to motivation levels in students and that students with parents with higher education had higher motivation than their peers.

Moreover, such parents may be less likely to provide resources necessary to the cultivation of self-regulated learning skills in their children. Parents with greater education are more likely to have the intellectual resources needed to support and encourage the process of development of self-regulation within their children by motivating their children to take interest in organizing their own learning process (Zimmerman, 2002).

The role of parental education in academic performance is well established in research. Jeynes (2007) indicated that higher parental education is associated with greater involvement in school-related activities, which can improve academic performance. Educated parents not only play as role models for their children but they are also able to assist their children in their academic work as well as setting up a supportive environment. On the other hand, children with uneducated parents are more likely to struggle academically with lower parental involvement and resources and lack of support and encouragement (Davis-Kean, 2005).

2.5.5. Differences in Academic Motivation, Self-Regulated Learning and Academic Performance as a Function of Family Structure

One of the microsystems that students develop in is family which influences emotional, time and financial resources as well as parental involvement and styles, and in general the home environment all of which impact academic motivation, self-regulated learning and academic performance. Shabnam (2025), in a study that comprised 492 participants from universities in Bangladesh, found that students from single parent families and those from nuclear families had the highest achievement motivation. Similarly, in an Ethiopian study with 201 adolescents, Belay & Sitota (2024) showed that boys from intact families were more motivated than girls in step families.

Two-parent families tend to have more financial and material resources, more parental time, and greater ability to provide a stable home and learning environment. These contribute

directly to academic performance and also support self-regulated learning as well as promoting greater motivation. Mihret (2019) reported statistically significant association between self-regulation and family structure.

Research also confirms the association between family structure and academic performance. In the USA, a research done on 902 public schools in California with 490,000 responses collected from high students found that students within different family structures exhibited differences in GPA (O'Malley et al., 2015). Another study from Kenya reported that students from nuclear families performed better academically (Nato, 2016).

2.5.6. Differences in Academic Motivation, Self-Regulated Learning and Academic Performance as a Function of Grade level

Research shows that academic motivation tends to decline with grade level. Gottfried (1985) reported that the intrinsic motivation of students in reading and math decreases as they transition from elementary to high school. Similarly, Otis et al. (2005) demonstrated that motivation decreased steadily from grade 7 through grade 11, with a shift from intrinsic to extrinsic motivational orientations. (Anderman & Maehr, 1994) has blamed heightened academic pressure and curriculum that's not so interesting to adolescents for this drop.

Studies also show that self-regulated learning levels and academic performance differs by grade level. Panadero (2017) expressed that students in higher education exhibit greater metacognitive awareness, increased use of cognitive strategies and manage their time better than younger students. Students often experience a drop in their academic performance, especially those with lower SRL or motivational levels (Al-Harthy et al., 2010). On the contrary, students with high SRL skills can maintain or improve performance despite increased academic demands (Zimmerman & Schunk, 2011).

2.6. Summary and Implications of the Revised Literature

The above review of literature has tried to briefly overview the basic concepts, assessments, and theories of academic performance, academic motivation, and self-regulated learning as well as the empirical review on relations between these variables. Research demonstrates that there is a relationship between academic motivation, self-regulated learning, and academic performance (Zimmerman & Schunk, 2011). On the other hand, there are also some studies that report some contradictory findings showing some mixed results (Matuga, 2009; Vohs & Baumeister, 2016). This hints that the relationship that exists may be complex or context dependent.

Based on the above, the researcher has been able to pinpoint some gaps, the first is that there is limited research on the collective interplay or interaction of the variables under investigation and the mechanisms that link these factors. There is especially a dearth of research and information with regards the relationship between the two independent variables and the mediating role of self-regulated learning in the context of Ethiopia. Many of the studies also do not deal with how demographic factors like school type and parental education influence the relationship between academic motivation, SRL, and academic performance. Many of the studies are also limited to specific populations like college students or children with some longitudinal studies. This particular study hopes to address these gaps by, exploring the joint interplay and mechanisms that link the aforementioned variables, taking the Ethiopian context in to consideration, including different demographic factors and how they relate to the variables in question.

2.7. Theoretical Framework

I) Self-determination Theory

Ryan and Deci (1985) proposed the self-determination theory positing that behaviour may be externally motivated, internally motivated or amotivated. The theory asserts that motivation is driven by feelings of autonomy (people are more motivated when they feel they can control the situation) , competence (people get motivated when they know they can achieve something) and relatedness (they feel motivated when they know they can get help and feel connected). The theory distinguishes between intrinsic motivation , extrinsic motivation and amotivation further classifying them in to different dimensions. Intrinsic motivation, the type of motivation that is internally driven out of interest, desire of mastery, or enjoyment of an activity, for instance, is further categorised in to intrinsic motivation to know, intrinsic motivation towards accomplishments and intrinsic motivation to experience stimulation. On the other hand extrinsic motivation is divided in to extrinsic motivation identification, extrinsic motivation introjection , and extrinsic motivation external regulation. Amotivation represents little motivation and apathy. It is generally assumed to contribute little to academic performance (Vallerand & Bissonnette, 1992).

II) Self-Regulated learning

One of the three models developed by Zimmerman on Self-regulated learning is the cyclical phases of self-regulated learning often called Zimmerman's SRL model. First presented in 2000, it was later modified to include certain elements. It demonstrates the dynamic process of SRL through three cyclical phases, each of which has its own sub processes. These are the forethought, performance and self-reflection phases. The forethought phase is where preparation takes place, sub processes like task analysis where students try to understand requirements and objectives of a learning task, identify resources, and assess difficulties. There is also planning in the form of goal setting and motivational beliefs.

Second is the performance phase, which is divided in two sub process which includes self-control and self-monitoring strategies like time management and task strategies where students determine appropriate techniques to tackle tasks , structure their learning environment, seek assistance and self-record. Finally, the self-reflection phases in the form of self-judgements and self-reactions. Throughout the years the model has received extensive empirical support (Puustinen, M., & Pulkkinen, L. , 2001) (DiBenedetto & Zimmerman, 2010). The model has also given rise to several instruments and measurement methods (DiBenedetto & Zimmerman (2010), Cleary & Zimmerman , 2001, 2012), Kitsantas & Zimmerman, 2002).

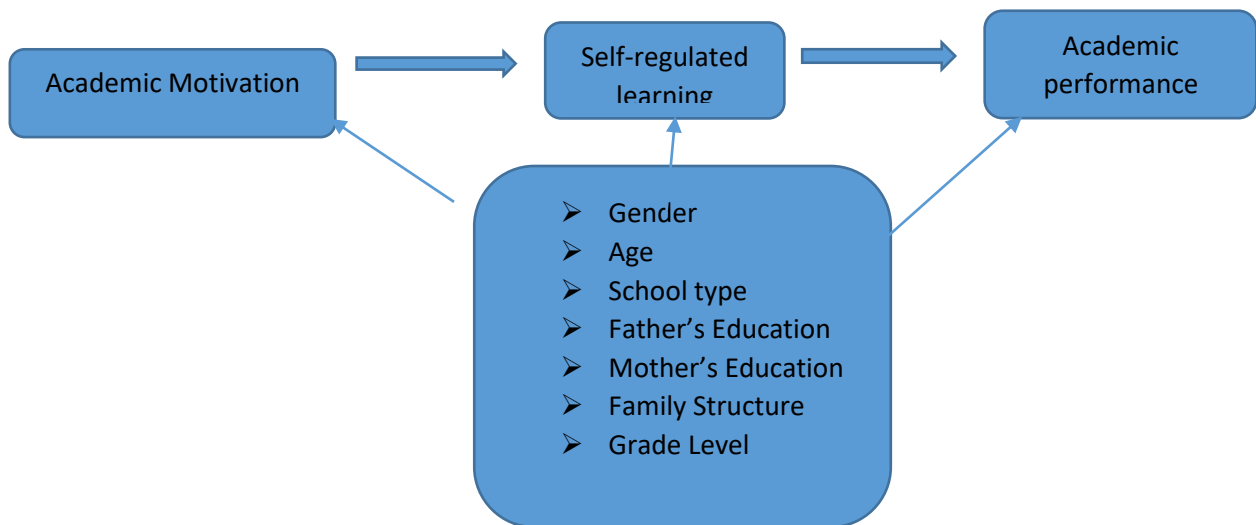
2.8. Conceptual Framework

There are two independent variables in this study, namely, motivation and self-regulated learning and the dependent variable is academic performance. The expected interactions between variables are as modelled below in figure 1. The first is that there is a relationship between academic motivation and academic performance, i.e, the greater academic motivation a student has, the more likely the student will put effort in to their academics and so the better their performance. On the contrary, low academic motivation may indicate that they lack the ambition to put an effort in to their academic activities and therefore may contribute to low performance. Secondly, self-regulated learning is anticipated to influence academic performance as students control, monitor, and evaluate the process of their own learning they are bound to enhance their academic achievement. Moreover, students' greater motivation in their academics may contribute towards their self-regulatory process and therefore the more self-regulated they are in their studies. Demographic differences like gender, age, school type, parental education and family structure in both motivation and self-regulated learning are also bound to occur.

The main study variables are;

- I. Independent variable is academic motivation
- II. Independent variable/Mediating Variable is self-Regulated learning
- III. Dependent Variable is Academic performance

Figure 1: *Conceptual Model of the Study*



Chapter Three

Methods

This chapter depicts the research methods, more specifically the research design, study site and population, sampling and sampling techniques, data gathering tools, translation and validation of tools, data collection procedures, data analysis techniques and ethical considerations.

3.1. Research Approach and Design

This study used the parallel convergent mixed methods research. Mixed methods research, as per Creswell (2014) combines both quantitative and qualitative methods drawing up on the strengths of both. In the convergent mixed methods design, quantitative data and qualitative data are collected and analysed within the same period of time, with the qualitative part being used as a supplement to help compare, explain or provide context to the quantitative results. This design is used because it's the best of both worlds as it allows the researcher to utilise the quantitative method to examine patterns and explore relationships or interplays between the variables, while at the same time the qualitative follow up allows the researcher to bring out the subjective element and delve deeper in to the experiences , perceptions and contexts of individuals with the aim of gaining a more comprehensive understanding of the research problem. This is in line with a pragmatic paradigm, which supports the use of multiple methods to answer research questions effectively, utilising both objective and subjective perspectives.

3.2. Study Site and Population

Population is the total pool of elements from which inferences are made (Cooper & Scindler, 2008). The target population of the study are the students at two high schools in Addis Ababa that amount to 1525 students. The first school was a government school

(Temenjayzh secondary school) located in the Kirkos area, and the other school was a private school (Dandii Boru) located around the Bole area, in the capital city of Ethiopia, Addis Ababa. The two schools were selected to provide the two contrasting educational contexts.

Selecting smaller samples from multiple schools with the limited overall sample size determined through the sample size determination formula would have reduced the quality of the quantitative analysis with each school ending up with too few participants to allow for meaningful comparisons. Unequal group sizes would also have reduced the statistical power. It would also have been harder to see whether differences come from the schools themselves or due to random variation in small samples. The contextual depth of the qualitative analysis would have also likewise been affected.

The study involved a sample of students (317) from grades 9 to 12, who are at different developmental stages extending from middle adolescence to emergent adulthood and were enrolled for the 2024/25 academic year in these two high schools.

3.2.1. Inclusion and Exclusion Criteria

3.2.1.1. Inclusion Criteria

- High school students enrolled at the schools during 2024/25 academic year.
- Students who are in the adolescent or emergent adulthood developmental stage.
- Students who are in high school from grades 9 to 12.
- Students who provided the necessary informed consent and were willing to take part in the study.

3.2.1.2. Exclusion Criteria

- Students who declined to take part in the study.
- Students who were absent at the time of data collection.

3.3. Sample and Sampling Techniques

Three types of sampling techniques were used in the study. Stratified random sampling was used to select the students from each school. The roster data of all the high school students was collected from both schools and categorised in to different strata based gender, school type, class level and average grades of students at the end of the semester. After which, a number of students were randomly selected using proportional allocation to proportionally allocate the population strata to the sample strata.

Convenience sampling was used to select the schools, considering the schools' willingness to permit the research. Since after contacting different schools these were the schools that permitted the research to be conducted and fulfilled the inclusion criteria of being from grades 9 to 12. They were also purposively chosen because they were comparable and similar in key characteristics to the schools where the pilot study was conducted. So the selection was influenced by both practical and methodological considerations and may offer some insights within comparable educational contexts.

Purposive sampling was also used to select the participants for the qualitative component of the study based on particular criteria. The selection criteria ensured that the participants reflected each participating school, class level, gender, and grade.

3.3.1. Sample size determination

A sample of 317 students was selected with stratified random sampling using Yamane's (1967) sample size determination formula.

$$n = \frac{N}{1 + N(e)^2}$$

Roaster data was acquired from the respective schools for the whole population of high school students in the two schools. This data was then categorised by gender, school type, student average grades at the end of the semester, and class level. This was done to ensure

that the sample reflected the diversity of the student population. Then the sample was drawn through proportional allocation which resulted in 176 students being sampled from the government school with the remaining 141 students making up the students from the private school.

3.4. Data Gathering Tools

Academic motivation was measured by a revised version of the Academic Motivation Scale (Vallerand et al ., 1992) based on EFA and CFA extracted factor structure. Originally, this is a 28 item scale that measures the different types of academic motivation classifying them in to different subscales. Each subscale of intrinsic motivation, extrinsic motivation and amotivation have four corresponding items. Intrinsic motivation is measured by three subscales: intrinsic motivation to know, intrinsic motivation toward accomplishment, and intrinsic motivation to experience stimulation. Extrinsic motivation also has three subscales: extrinsic motivation identified, extrinsic motivation introjected and extrinsic motivation external regulation. Amotivation stands alone as one subscale with four items. Each item has a 7-point scale and originally the scaling was: 1= Does not correspond at all , 2 and 3= Corresponds a little, 4 = corresponds moderately , 5 and 6 = Corresposnds a lot , 7= Corresponds exactly but as the scale was adopted based on Mutweleli (2014) with minor changes, the scaling is changed to: 1= Totally Disagree , 2= Disagree, 3 = Slightly Disagree, 4 = Undecided , 5= Slightly Agree , 6= Agree, 7 = Totally Agree. The revised scale on the other hand, has 13 items with 3 factors or subscales: Extrinsic motivation – future career oriented , Intrinsic Motivation – interest driven, and Amotivation measured on the same 7-point scale.

Considering that the EFA extracted factors produced a new factor structure with mixed loadings between subscales of the original scale, it was impossible to apply weights employed in the traditional SDI formula that has been used in the original AMS. To mitigate

this issue, CFA factor scores were used as subscale scores and a latent factor score was used as an over all motivation score since it accounts for amotivation . DiStefano, Zhu, & Míndrilă (2009) suggested that factor scores can be computed and applied in further analysis.

Therefore, the weights applied to intrinsic and identified subscales in the original could not be applied for this study. To categorise the levels of academic motivation the factor scores were partitioned in to three categories and classified as low, average and high. To make this assessment more comparative and to triangulate the findings item level scores and descriptive statistics were also analysed and interpreted.

The internal consistency of the scale was originally reported as being between 0.83 and 0.86 (Vellerand et al., 1992). The internal consistency of the original scale subscales in this study were also assessed in the pilot study and compared with the internal consistency of the subscales of the revised scale. The subscale Chronbach's alphas were somewhat higher in the revised scale. Table 1 below presents a comparison of Chronbach's alpha of the original scale vs. the revised version of the AMS.

Table 1: *Chronbach Alpha's for Academic Motivation Scale (original vs. revised)*

Original AMS (Pilot)				Revised AMS		
No	Sub-scale	Number of Items	Cronbach's Alpha	Sub-scale	Number of Items	Cronbach's Alpha
1	IMTK	4	0.73	EM-FCO	5	0.80
2	IMTA	4	0.71	IM-ID	4	0.73
3	IMTS	4	0.65	Amotivation	4	0.74
4	EM-Iden	4	0.72			
5	EM-Introj	4	0.68			
6	EM-Reg	4	0.77			
7	Amotivation	4	0.74			

Note : IMTK= intrinsic motivative to know ; IMTA = Intrinsic Motivation to Accomplish ; IMTS = Intrinsic Motivation Toward Stimulation; EM-Iden = Extrinsic Motivation-Identified; EM-Introj = Extrinsic Motivation – Introjected; EM-Reg = Extrinsic Motivation – External regulation.

Self-regulated learning was also measured through a revised version of the Academic Self-Regulated Learning Scale (A-SRL-S) developed by Magno (2010). The original scale has 54 items that are classified in to seven self-regulated learning strategies, namely; memory strategy, goal setting, self-evaluation, seeking assistance, environmental structuring, learning responsibility, planning and organizing. The modified scale based on EFA derived factor solution has 31 items and 7 factors or subscales: Self-evaluation, Goal setting and tracking progress, Environmental structuring, Learning responsibility and organizing, Memory strategies – active practice & recording, Seeking assistance, and structuring information & resource use, which are measured with a 4-point scale.

Subscale scores, as in the original, were attained through summing all the item scores of each subscale then the subscale scores were summed up to achieve the overall self-regulated learning score. For the main study, cut off scores were rescaled based on how they were designated in Mutweleli (2014). The minimum and maximum possible scores fell between 31 and 124. Scores between 31 and 61 were labelled as low, scores between 62 and 92 were designated as average while scores falling between 93 and 124 represented high level of self-regulated learning.

The scale was originally reported to have strong validity and its internal consistency was reported to be between 0.73 and 0.87 (Magno, 2011). In this study, the sub-scale cronbach's alphas were slightly higher in the revised scale compared to that of the pilot, though one subscale in particular, Seeking Assistance, displayed a low cronbach's alpha in both the original and revised scale. Given that the overall reliability value was high (0.91), this

subscale was retained. The comparison of chronbach's alpha of the original scale vs. the revised version of the A-SRL-S is displayed below in table 2.

Table 2: *Chronbach Alpha's for Academic Self-Regulated Scale (original vs. revised)*

		Original		Revised		
No	Sub-Scale	Number of items	Cronbach's Alpha	Sub-Scale	Number of items	Cronbach's Alpha
1	MS	14	0.77	SE	6	0.84
2	GS	5	0.70	GSTP	7	0.81
3	SE	12	0.82	ES	4	0.77
4	SA	8	0.66	LRO	4	0.74
5	ES	5	0.69	MS-APR	3	0.70
6	LR	5	0.54	SA	3	0.62
7	O	5	0.72	SIRU	4	0.74

Note: MS = Memory Strategies; GS = Goal Setting; SE = Self-Evaluation; SA = Seeking Assistance; ES = Environmental Structuring; LR = Learning Responsibilities; O = Organizing and planning.

Academic performance, in the main study, was measured by the average semester grades of the students at the end of one semester which was converted in to t-scores for the inferential analysis to enable meaningful comparisons while the raw scores were retained for the descriptive analysis to present them in a readily interpretable form. Initially, the researcher had also used the Academic Performance Scale, a self-report questionnaire developed by the researcher to supplement the performance data collected as raw average grades but up on examining the data the results were found to be contradictory making interpretation impossible. For this reason, the data collected from this scale was not presented or used in the analysis. The average grades collected from the students were also categorized as low, average and high based on information obtained directly from the ministry of

education with grades < 50 being considered as low, those within 50 to 74 range as average, while 75 and above were considered as high. In addition to this, 17 item semi structured interviews developed by the researcher were used for the qualitative analysis.

3.5. Data Collection Procedures

Data collection was conducted by the researcher and assistant at the particular schools between April 11 and May 13, 2025 in the schools' library and hall. In order to collect data, permission was sought from the schools and consent letters were sent to those concerned . On the day of data collection, the purpose of the study was explained to the participants. They were also assured of the confidentiality and anonymity of their responses. The questionnaires were administered at the agreed up on times with the school, which required multiple visits, and the instructions were read out loud to the students as well as providing them with necessary explanations if required. The non-interactive group interviews and one on one interview were also conducted during the same period of time. A non-interactive group interview is an interview format where a group of participants are present together and each reply to the questions one at a time without interacting with one another. This method was used due to time constraints imposed by the schools.

3.5.1. Pilot study report

Because Reliability analysis of the tools was deemed necessary, a pilot test was conducted at Future Talent school, a private school in the Bole area and Shimelis Habte, a government school in the Kirkos area with a sample of 45 students. The sample from the private school was composed of 10 students while those from Shimelis Habte made up 35 students. The sampling techniques and sites of both the pilot study and the main study share similar characteristics. The pilot was used to assess the reliability and content validity of the initial

scale in order to prepare it for the main study. Any weaknesses identified by the pilot study were handled as deemed fit in order to improve the tools for the main study.

3.6. Translation and Validation of Tools

Four experts were asked to rate the items of these scales to assess the content validity of the scales across 5 criteria: relevance, clarity, language, cultural applicability and comprehensiveness. I-CVI, S-CVI/Ave, and S-CVI/UA values were computed across these domains. On the AMS, 19 items had total agreement across all the criteria from the experts with only 9 items having I-CVI values of 0.5 across some criteria. The S-CVI/UA for all the rated criteria on the AMS was > 0.78 , while on the second scale 48 items had total agreements on all criteria with only 6 items having I-CVI values of 0.5 across some domains. S-CVI/UA across all the domains that were rated for this scale was > 0.90 . The first scale also had S-CVI/Ave value > 0.89 across all domains, while the second had S-CVI/Ave values > 0.95 .

The content validity of the scales after the EFA and CFA extracted items was also assessed. On the AMS, 10 out of 13 items gained total agreement across all domains rated, with I-CVI value of 1.00. S-CVI/Ave was > 0.88 across all the domains and S-CVI/UA was > 0.84 across four domains and 0.77 for comprehensiveness. For the A-SRL-S, all items had I-CVI = 1.00 and therefore S-CVI-Ave and S-CVI/UA were both 1.00, which overall indicates an acceptable content validity (Polit & Beck, 2006).

For academic performance, two experts rated and independently evaluated the extent to which semester average grades adequately represent students' academic performance across five domains. On a 5-point scale, the experts gave it a score of 4 and 5, suggesting high agreement and strong content validity.

Initially the questionnaire also included an academic performance scale. For this self-report scale, both spearman correlation and Wilcoxon test were done to check if there is any

consistency between the actual grades and students self-report grades on the pilot. The correlation revealed a positive correlation of ($r = 0.54$) with a p-value of < 0.001 . On the other hand, the Wilcoxon test showed significant differences between the two with a p-value of 0.01, with some students underreporting and others over reported their grades while only 3 reported their actual grades. As the correlation was below 0.8 despite the fact that it was a positive correlation and the Wilcoxon test showing significant differences, it indicates some level of inconsistency and was therefore not included in the analysis of this study despite data collection.

Translation was done by a professional translator which was then checked and corrected by the researcher to ensure linguistic accuracy and theoretical relevance. The translation was also further checked by a linguistics instructor at AAU. The scales were first translated from English to Amharic then back to English again from the Amharic.

Convergent validity was assessed; the CR for the AMS was 0.90 and 0.96 for the A-SRL-S which were all > 0.7 . However, AVE for the AMS was 0.44 and 0.46 for A-SRL-S, which were all slightly < 0.5 . But since all CR were somewhat high and greater than AVE values, convergent validity was supported, as some studies have suggested that as AVE is too strict and so long as the composite reliability is adequate the former can be accepted despite being slightly lower (Malhotra and Dash, 2019).

Discriminant validity was also tested through the Fornell-Larcker Criterion and AVE and MSV comparisons. AVE was greater in both which indicates that discriminant validity was satisfied. Construct validity was also assessed, and the measurement models of both scales showed acceptable fit which is presented along with the EFA results in Appendix J.

The use of students' average semester grades collected from official school records in this study is consistent with similar practice in previous research, in which this measure has been commonly used as a valid indicator of achievement (Mutweleli, 2014; Richardson et al.,

2012; Ostermann et al., 2022; Yusoff et al., 2013). The grades were based on standardized institutional assessment procedures which are also accepted by the ministry of education and across schools, which indicates some level of consistency and supports its validity.

3.7. Techniques of Data Analysis

Statistical analyses were performed using IBM SPSS Statistics (Version 28) and IBM SPSS AMOS (Version 23.0.0).

3.7.1 Assumption Tests

Various assumption tests were run to check if assumptions were met before conducting the main statistical tests indicated below. Normality was assessed through Shapiro Wilk's test. Skewness and kurtosis were also examined along with visual inspections. Linearity was tested through checking the scatter plots of the variables. Additionally, Variance Inflation Factor (VIF) and tolerance values were checked to evaluate multicollinearity and independence of residuals was also checked through Durbin- Watson. The full results of the assumption tests are presented in Appendix H .

3.7.2. Exploratory Factor Analysis, Confirmatory Factor Analysis and K-Fold Cross Validation

Given that one of the research questions involved a mediation analysis, and also since the AMS has never been validated within Ethiopian contexts, it was deemed necessary to conduct exploratory and confirmatory factor analyses. EFA is a technique that is used to detect the underlying factor structure by grouping correlated items within factors while the CFA is used to verify the model based on extracted factors from the EFA or from theory. K-fold cross validation was also applied to assess factor stability and consistency of model fit. For the main EFA and the k-fold cross validation EFAs, principal axis extraction method was used with promax rotation, while maximum likelihood was used for the CFA. The results of

these analysis are all presented in Appendix J, which is recommended as it contains the relevant factor structures, their respective labels and model fit indices.

3.7.3. Descriptive statistics

After data cleaning, descriptive analysis was used to describe frequencies and percentages. Moreover, it was used to assess the levels of the variables by calculating the range, the median, means and the standard deviation of the variables as well as showing the levels.

3.7.4. Inferential Statistics

3.7.4.1. Bootstrapped Pearson Correlation

The use of a 4 point Likert type scale to measure academic motivation and self-regulated learning as well as using semester average grades for academic performance means that the data is being treated as continuous. For this reason, Pearson correlation was deemed ok to assess the relationship among the three variables despite normality tests identifying a slight non-normality which was handled through robust methods. For the direction of the correlation, there is positive and negative correlation. The magnitude was assessed from 0 (weak correlation) to 1 (perfect correlation). P-value lesser or greater than 0.05 indicates whether or not the correlation is statistically significant.

Bootstrapping was used with 5000 samples to make the analysis more robust to the slight violations of normality.

3.7.4.2. Bootstrapped Multiple Regression Analysis

Bootstrapped regression analysis (5000 resamples) was used to check the proportion of variance in the dependent variable (academic performance) as explained by the independent variables (academic motivation and self-regulated learning). The R^2 , adjusted R^2 , beta coefficients and p-values were assessed to check how much of the variance in

academic performance is explained by these variables, jointly, and whether or not these relationships are statistically significant respectively. To check the variance explained by the predictors independently part correlations were squared. Bootstrapped regression was used as it is quite robust to slight violations of normality.

3.7.4. 3. Structural Equation Modelling

Bootstrapped Structural Equation Modelling (5000 resamples) was employed for the mediation analysis. It allowed the researcher to understand if self-regulated learning explains how motivation influences academic performance. If self-regulated learning acts as a mediator, it suggests that students who have greater motivation levels might perform better academically because they have better self-regulated learning skills.

3.7.4.4. One-wayANOVA and Independent Samples T-tests

Bootstrapped One-way ANOVA along with Welch's ANOVA (when assumption of equal variance is violated) with 5000 samples were used for assessing demographic differences except for gender and school type which were assessed through independent samples t-test. Both of these tests are parametric tests. The one-way ANOVA is a procedure used when assessing differences of means across three or more groups when data is normal or approximately normal though Kirk (1995) deemed it to be quite robust to violations of normality for which reason it was employed in this study while the t-test is applied to check differences between two groups.

Given that data showed slight non-normality, as shown in the assumption tests in the results section, and despite the fact that the many of the parametric tests have already been acknowledged as robust, bootstrapping was used in all of the inferential statistics with 5000 resamples in order to make the procedures more robust. Many researchers have advocated the use of bootstrapped parametric tests when they have been chosen to handle slight deviations

of normality (Karolczak, Kuliczowski & Watala, 2024; Cribbie, 2012). Hesterberg (2014) recommends using 1000 to 10,000 or more resamples for greater accuracy. In addition to this the data were also informally assessed through non-parametric tests (Spearman correlation, Kruskal Wallis H test and Mann Whiteny U test) which yielded similar results to the parametric tests so the use of the latter was justified.

3.8. Ethical Consideration

In conducting this research, the following ethical guidelines were followed as per the APA, 7th edition. The manual integrates ethical reporting in different sections like ensuing the rights of participants through obtaining consent, minimizing risks to participants or maintaining confidentiality (American Psychological Association, 2020).

After getting the letter of permission and the necessary approval from the appropriate institutions to conduct the study, voluntary participation was sought and obtained through Informed consents.

Data collected was kept confidential in order to protect the privacy of the participants. The researcher also ensured that the participants' identities are not linked to their data. This is done to ensure their rights to privacy and maintain ethical standards.

The researcher was honest and transparent about relevant data and phenomenon observed throughout the study in order to maintain integrity of the research. Participants were also assured that there was no physical or psychological risk or harm to them in the research process.

Chapter Four

Results

In the current chapter, the results of the study are presented. These findings are organised in to tables and the relevant statistical results are reported in order to address each of the research questions. It has seven main parts. First, is the demographic characteristics of the participants are presented followed by the levels of the variables and descriptive statistics. The third part presents the relationships among the variables which is then followed by the variance explained, the SEM mediation analysis and demographic differences then lastly, the qualitative results.

4.1. Demographic Characteristics of the Participants

Seven demographic characteristics of the participants were collected. These are presented as follows in Table 3. Out of the 317 total samples of students, a slight majority, 53.5 %, were female while the remaining 46.7% were male. This was so because the sample was proportionally allocated based on gender, grade, school type and performance. 27.1% of those sampled were 17 year olds followed by 22.4% of 16 year olds, 18 year olds (19.2%) , with 15 year olds making up 17% which shows that the majority of students were in the mid to late adolescent developmental stage with a mean age of 16. 71. Ninth graders made up about 29.3%, which is closely followed by eleventh and twelfth graders with 24.6% and 24.3% respectively while the remaining made up tenth graders. The participants were further composed of 55.5% government school students and 44.5% private school students.

Table 3: Characteristics of the participants (N=317)

Characteristics	Category	Frequency	Percent
Gender	Male	148	46.7
	Female	169	53.3
	Total	317	100
Age	14	16	5.0
	15	54	17.0
	16	71	22.4
	17	86	27.1
	18	61	19.2
	19	17	5.4
	20	9	2.8
	21	2	0.6
	22	1	0.3
	Total	317	100.0
Grade level	9	93	29.3
	10	69	21.8
	11	78	24.6
	12	77	24.3
	Total	317	100.0
School Type	Government	176	55.5
	Private	141	44.5
	Total	317	100.0
Father's Education	Degree and above	133	42
	Diploma	45	14.2
	High school	86	27.1
	Elementary	32	10.1
	No education	21	6.6
	Total	317	100.0
Mother's Education	Degree and above	90	28.4
	Diploma	63	19.9
	High school	85	26.8
	Elementary	45	14.2
	No education	34	10.7
	Total	317	100.0
Family Structure	Living with both parents	197	62.1
	Living with one parent	79	24.9
	Living with guardian or relative	39	12.3
	Other	2	0.6
	Total	317	100.0

The bulk of the participants , 42 %, reported that their fathers had degree and above indicating a fair amount of education though still below half, this figure decreases as the level of education ladders down, with only 6.6 % of the fathers having received no education. The majority or 28.4% of the mothers of the participants likewise also had degree and above , with the second highest figure or 26.8 percent only received high school education while 10.7% indicated no education. 62.1% of the participants also reported that they lived with both parents, followed by 24.9% who live with only one parent, whereas 12.3% and 0.6% of

the participants stated that they lived with guardians or other family members and by themselves respectively.

4.2. Levels of Academic Motivation, Self-Regulated Learning and Academic Performance among the Participants

Results from the descriptive statistics of the factor scores reveal a mean of 1.95 and a median of 2.10 for Academic Motivation with a standard deviation of 0.65. The minimum and maximum scores range from 0.00 to 3.01, which show that a considerable number of participants scored somewhere around the mean or slightly above it. In addition to this, the somewhat negative skew combined with the mean and median values confirms that the scores tend to be on the higher end.

The average range for the rescaled cut-off scores for Self-Regulated learning is between 62 and 92, so the mean and median values of 82.39 and 83 respectively suggest an average level of SRL. The slight left skew suggests that the scores tend to be moderate to above average.

Table 4: *Descriptive statistics*

		Statistic	Std. Error
Academic Motivation	Mean	1.95	.036
	Median	2.10	
	Std. Deviation	.65	
	Minimum	.00	
	Maximum	3.01	
SRL	Mean	82.39	0.84
	Median	83.00	
	Std. Deviation	15.01	
	Minimum	31.00	
	Maximum	120.00	
Academic Performance	Mean	66.63	0.77
	Median	65.57	
	Std. Deviation	13.78	
	Minimum	36.30	
	Maximum	99.60	

For academic performance, a mean of 66.63 and a median of 65.57, shows that the participants tend to be average performers. As mentioned before, up on request, the Ministry of Education communicated that average scores span from 50 to 74. A slight spread is observed with a standard deviation of 13.78, which hints that the participant's academic performance varies to some extent, which is consistent with the interquartile range of 15.90. Given that grades in the sample ranged from 36.30 to 99.60, this interquartile range suggests a medium level of spread among the performances of average students with half of the students having grades that differed by 15.90 points. The full descriptive statistics table is displayed in appendix I.

The factor scores for academic motivation, SRL scores and the student's average grades were used to classify the levels of the three variables as high, average and low only for the purpose of describing them as shown in table 5. Moreover, the mean of the item scores with their respective factors and item level descriptive statistics are elaborated below for triangulation purposes.

Table 5: *Levels of Academic Motivation, Self-Regulated Learning and Academic Performance*

	Level	Frequency	Percent
Academic Motivation	Low	32	10.1
	Average	110	34.7
	High	175	55.2
	Total	317	100.0
Self-Regulated Learning	Low	27	8.5
	Average	213	67.2
	High	77	24.3
	Total	317	100.0
Academic Performance	Low	39	12.3
	Average	204	64.4
	High	74	23.3
	Total	317	100.0

The results show that the majority of participants, 55.2%, reported higher levels of motivation within the sample which was followed by 34.7 % of students who exhibited average levels of motivation while only 10.1 % showed low levels of motivation.

Self-Regulated learning scores were also analysed to classify SRL levels as high, average, and low. The large majority , 67.2% , of the students exhibited average levels of SRL while 24.3% reported high levels of SRL and the remaining 8.5% seem to have low levels of SRL.

As shown above , for academic performance, the sampled students were predominantly average performers (64.4%) which make up the great majority of them. 23.3% were high performers and 12.3% were low performers.

Moreover, further descriptive statistics were done on each of the factors to reveal the means, median, standard deviation and other such statistics based on the factor scores in order to see the levels of each type of motivation that the participants reported as shown in table 6 below.

Table 6: *Descriptive statistics for Academic Motivation by sub-scale*

	Mean	Median	Range	Std.Dev	Skew	Kurtosis	Min	Max
EM-FCO	3.70	4.07	4.68	1.06	-1.01	.360	.51	5.19
IM-ID	2.88	3.06	4.07	.944	-.614	-.373	.48	4.55
Amo	1.60	1.50	4.61	1.14	.399	-.717	-.19	4.43

Note: EM-FCO = Extrinsic Motivation – Future Career Oriented; IM-ID = Intrinsic Motivation – Interest Driven; Amo = Amotivation.

The results in table 6 reveal that extrinsic motivation –future career oriented (M = 3.70, SD = 1.06) and Intrinsic motivation- interest driven (M = 2.88, SD = 0.944) had the highest means and medians following one another, which is corroborated by the results of the item score means and other descriptive statistics in table 7 below suggesting that the participants

experience extrinsic type of motivation or are mostly driven by external rewards of future career aspirations. Intrinsic motivation – Interest Driven (M = 2.88) closely followed which shows that students are also driven by the pure interest they have towards their academics. The item score mean for this factor was 4.20 with the median ranging from 3-5 and a mode ranging from 1-6, so relatively speaking this factor showed lower score than the former. On the other hand, the participants scored the least in amotivation (M=1.60) and on the 7 point scale an item score mean of 3.40, a median ranging between 2 and 4 and a mode of 1 .

Table 7: *Item score descriptives for academic motivation*

	Mean	Median	Mode	Min	Max
EM-FCO	5.10	5-6	6-7	1.00	7.00
IM-ID	4.20	3-5	1-6	1.00	7.00
Amo	3.40	2-4	1	1.00	7.00

Note: EM-FCO = Extrinsic Motivation – Future Career Oriented; IM-ID = Intrinsic Motivation – Interest Driven; Amo = Amotivation.

Descriptive statistics on the subdomains of SRL were also done to see which domain of SRL was predominant among the participants. See Table 8 below.

Table 8: *Descriptive statistics for SRL by subscale*

	Mean	Median	Range	Std.Dev	Skew	Kurtosis	Min	Max
SE	16.80	17.00	18.00	4.01	-.649	.237	6.00	24.00
GSTP	18.76	19.00	21.00	4.21	-.271	-.002	7.00	28.00
ES	10.99	11.00	12.00	2.74	-.652	.221	4.00	16.00
LRO	10.25	10.00	12.00	2.76	-.007	-.224	4.00	16.00
MS-APR	7.04	7.00	9.00	2.20	.069	-.383	3.00	12.00
SA	7.65	8.00	9.00	2.16	-.189	-.425	3.00	12.00
SIRU	10.86	11.00	12.00	2.68	-.407	-.097	4.00	16.00

Note : SE =Self Evaluation; GSTP = Goal setting &Tracking progress; ES = Environmental Structuring; LRO= Learning Responsibility &Organising; MS-APR = Memory Strategies- Active Practice & Recording; SA = Seeking Assistance; SIRU = Structuring Information &Resource Use.

Since the seven factors of SRL had different maximum possible scores, to achieve relevant and meaningful comparisons, the mean and median values were normalised to a percentage of their respective maximum possible values using the formula as showed in table 9.

Normalized Score (%) for the mean $= (\text{Mean Score} / \text{Maximum possible score}) * 100$

Normalized Score (%) for the median $= (\text{Median Score} / \text{Maximum possible score}) * 100$

Table 9: Normalized data

Strategy	Mean Score	Median Score	Max Possible	Mean (%)	Median (%)
SE	16.80	17.00	24.00	70%	70.8%
GSTP	18.76	19.00	28.00	67%	67.85%
ES	10.99	11.00	16.00	68.68%	68.75%
LRO	10.25	10.00	16.00	64.06%	62.5%
MS-APR	7.04	7.00	12.00	58.66%	58.3%
SA	7.65	8.00	12.00	63.75%	66.66%
SIRU	10.86	11.00	16.00	67.87%	68.75%

Note : SE =Self Evaluation , GSTP = Goal setting &Tracking progress, ES = Environmental Structuring , LRO= Learning Responsibility &Organising , MS-APR = Memory Strategies- Active Practice & Recording, SA = Seeking Assistance, SIRU = Structuring Information &Resource Use.

As per table 9, by percentage of means and medians, (70% and 70.8% respectively), self-evaluation (M= 16.80, SD=4.01) was rated highly, it was closely followed by structuring information &resource use (M=10.86,SD 2.68) , 67.87%, which demonstrates that, on the whole, these two strategies were rated higher than the other domains. The median also being high confirms that it's not just due to a few scores but rather that at least half of the participants did truly rate these strategies highly. Participants reported maintaining lower memory strategy- active practice & recording in comparison (M=7.04) which equates to 58.66%. These values being close to one another demonstrate that the participants don't rely on one strategy alone but rather utilized a range of SRL strategies.

Table 10: *Item score descriptives for SRL*

	Mean	Median	Mode	Min	Max
SE	2.80	3	3	1.00	4.00
GSTP	2.68	2-3	2-3	1.00	4.00
ES	2.74	3	3	1.00	4.00
LRO	2.56	2-3	2-3	1.00	4.00
MS-APR	2.34	2	2	1.00	4.00
SA	2.55	2-3	2-3	1.00	4.00
SIRU	2.71	3	3	1.00	4.00

Note : SE =Self Evaluation; GSTP = Goal setting &Tracking progress; ES = Environmental

Structuring; LRO= Learning Responsibility &Organising; MS-APR = Memory Strategies- Active

Practice & Recording; SA = Seeking Assistance, SIRU = Structuring Information &Resource Use.

4.3. Relationship of Academic Motivation, Self-Regulated Learning and Academic Performance

Pearson correlation was conducted to assess the relationship among academic motivation, self-regulated learning and academic performance as seen in table 11

Table 11: *Results of the correlation analysis among academic motivation, Self-regulated learning , and academic performance*

	Academic Motivation	Academic Performance
Academic motivation	-	.263**
Self-regulated Learning	.570**	.327**

Note: N=317 p < .001 (2-tailed).

The correlation showed that there was a modest significant positive correlation between academic motivation and academic performance ($r = 0.26$, $n = 317$, $p = < 0.001$), which indicates that higher levels of motivation are somewhat associated with higher academic performance. The correlation results also demonstrated a similar level of positive significant relationship between self-regulated learning and academic performance ($r = 0.32$, $p < 0.001$). A Pearson correlation was also used to analyse the link between academic motivation and

self-regulated learning as shown above. The findings reveal that there was a moderate positive significant correlation between these variables ($r = 0.57$, $n = 317$, $p < 0.001$) suggesting that greater self-regulated learning is associated with higher academic motivation.

Further Pearson correlation was done to check whether the several factors of motivation related differently to academic performance and to one another. The analysis showed that there was a modest significant positive correlation between intrinsic motivation-interest driven and students' grades ($r = 0.24$, $n = 317$, $p < 0.001$) which was the highest correlation among the other factors. Consistently, extrinsic motivation- future career oriented also showed a slightly lower positive significant relationship ($r = 0.20$, $p < 0.001$). Amotivation, on the other hand, was significantly negatively correlated to Academic Performance ($r = -0.33$, $p < 0.001$) to some extent.

Intrinsic motivation- interest driven and extrinsic motivation – future career oriented were both highly and positively correlated to one another ($p < .001$) while amotivation was negatively correlated to all the other factors. The high inter factor correlation was examined for item level redundancy through inspecting the inter item correlations, which were all below 0.60 suggesting little to no overlap. This indicates that the high correlation could be due to meaningful connection among closely related but distinct factors.

Table 12: *Correlation between Academic Motivation Factors and Academic Performance*

	EM-FCO	IM-ID	Amo	Academic Motivation	Academic Performance
EM-FCO	1				
IM-ID	.717**	1			
Amo	-.534 **	-.481 **	1		
Academic Motivation	.956**	.868 **	-.659 **	1	
Academic Performance	.200**	.249 **	-.330 **	.263**	1

Note: EM-FCO = Extrinsic Motivation – Future Career Oriented; IM-ID = Intrinsic Motivation – Interest Driven; Amo = Amotivation.

To see if the various dimensions of SRL related differently to Academic Performance and how they related among themselves a Pearson correlation was conducted. The correlation between the domains of SRL and students' grades revealed that environmental structuring was significantly positively correlated to academic performance ($r = 0.39, p < 0.001$). This was followed by a significant positive correlation between academic performance and goal setting and tracking progress ($r = 0.26, p < .001$), self-evaluation ($r = 0.25, p < 0.001$), structuring information & resource use ($r = 0.25, p < 0.001$), learning responsibility & organising ($r = 0.18, p < 0.001$), and memory strategies – active practice & recording ($r = 0.15, p < 0.005$). However the correlation between seeking assistance and academic performance was not significant ($r = 0.07, p = 0.178$).

As displayed in table 13, the highest positive correlation among the domains of self-regulated learning was observed between structuring information & resource use and environmental structuring ($r = 0.57, p < 0.001$) while the lowest correlation was between seeking assistance and goal setting & tracking progress ($r = 0.30, p < 0.001$).

Table 13: *Correlation between Self-regulated learning Factors and Academic Performance*

	SE	GSTP	ES	LRO	MS-APR	SA	SIRU	SRL	A.P
SE	1								
GSTP	.500**	1							
ES	.493**	.552**	1						
LRO	.434**	.417**	.437**	1					
MS-APR	.401**	.427**	.351**	.317**	1				
SA	.426**	.300**	.328**	.339**	.325**	1			
SIRU	.504**	.466**	.570**	.436**	.432**	.383**	1		
SRL	.788**	.782**	.751**	.671**	.621**	.581**	.748**	1	
A.P	.254**	.260**	.396**	.186**	.156**	.076	.253**	.327**	1

Note : SE =Self Evaluation; GSTP = Goal setting &Tracking progress; ES = Environmental Structuring; LRO= Learning Responsibility &Organising; MS-APR = Memory Strategies- Active Practice & Recording; SA = Seeking Assistance, SIRU = Structuring Information &Resource Use; SRL=Self-Regulated Learning

Additionally, further correlation analysis between the factors of motivation and domains of Self-Regulated Learning were done in order to see how different types of motivation related to the different strategies of SRL as shown below in Table 14. The results show that the strongest though moderate significant positive correlation was between interest driven intrinsic motivation and self- evaluation ($r = 0.49$, $n=317$, $p < 0.001$) . This was followed by the significant positive correlation between self-evaluation and extrinsic motivation – future career oriented ($r = 0.46$, $p < 0.001$). In contrast amotivation was modestly negatively correlated to all the Self –Regulated Learning strategies with ($p < .001$) as expected.

Table 14: *The results of the correlation analysis between subscales of the AMS and A-SRL-S*

	EM-FCO	IM-ID	Amo
SE	.461**	.497**	-.351**
GSTP	.360**	.411**	-.332**
ES	.338**	.391**	-.383**
LRO	.383**	.419**	-.352**
MS-APR	.311**	.401**	-.259**
SA	.238**	.283**	-.120*
SIRU	.289**	.398**	-.318**

Note : SE =Self Evaluation; GSTP = Goal setting &Tracking progress; ES = Environmental Structuring; LRO= Learning Responsibility &Organising; MS-APR = Memory Strategies- Active Practice & Recording; SA = Seeking Assistance, SIRU = Structuring Information &Resource Use; EM-FCO = Extrinsic Motivation – Future Career Oriented; IM-ID = Intrinsic Motivation – Interest Driven; Amo = Amotivation.

4.4. The proportion of variance in Academic Performance explained by Academic Motivation and Self-Regulated Learning jointly and independently

In order to answer the third research question and assess the proportion of variance in the dependent variable independently and jointly explained by the independent variables, bootstrapped multiple linear regression estimates (5000 resamples) was utilised. Bootstrapping was applied in order to address potential violations of normality assumptions in the residuals. Three models were run with Academic Motivation and SRL as the predictors while Academic Performance was seen as an outcome variable. The first model was done to assess the proportion of variance in academic performance explained by motivation independently, while the second model was done to see the variance explained by Self-Regulated Learning independently and the third model shows the variance explained by both the independent variables jointly. Moreover part r^2 results were squared to reveal the unique variance explained by each of the independent variables.

Table 15: *Results of the Regression Analysis on the variance explained by Academic Motivation and Self-Regulated Learning in Academic Performance*

Model	R	R ²	Adjusted R ²	Std. Error of the Estimate	F	P	Part r
AM	.263	.069	.066	9.66	23.45	<.001	.094
SRL	.327	.107	.104	9.46	37.65	<.001	.215
AM&SRL	.340	.116	.110	9.43	20.51	<.001	

Note: AM= Academic Motivation; SRL = Self – Regulated Learning.

In the result, the F value of the three models 23.45, 37.65, and 20.51 respectively (with $p < .001$), indicates that they are statistically significant. In the first model, when academic

motivation was examined individually as a predictor and academic performance as the outcome, academic motivation was found to explain 6.6% (adjusted R^2) of the variance in academic performance ($R^2 = 0.069$; Adjusted $R^2 = 0.066$). Since R^2 with one predictor alone includes unique plus shared variance explained, further analysis with part r^2 was computed and squared to reveal the unique variance explained by academic motivation alone without any shared variance (part $r = 0.094$), which when squared is around 0.9% which is approximately 1% and quite small.

In the second model, self-regulated learning as the predictor explained 10.4% of the variance in academic performance ($R^2 = 0.107$; Adjusted $R^2 = 0.104$) and (part $r^2 = 0.215$) showed that SRL uniquely explained 4.6% of the variance in academic performance. See Table 15.

In the third model, both predictors were examined simultaneously to assess the variance they jointly explain, with ($R^2 = .116$; Adjusted $R^2 = .110$) the total joint variance explained by the two predictors in academic performance was 11%. When the two squared part r are summed they make up about 5.5%, and the remaining 5.5% is due to shared variance.

In the regression analysis, academic motivation on its own was a significant predictor, $B = 4.04$, $\beta = .263$, $t = 4.843$, $p = <.001$. Self-Regulated Learning alone also significantly predicted academic performance, $B = 0.218$, $\beta = .327$, $t = 6.136$, $p < .001$. This shows that academic performance (measured in t-scores) is increased by 4.04 units when motivation alone increases by one unit, while with self-regulated learning individually, academic performance is increased by 0.218 units, but β in SRL's case is greater than β for motivation while both are significant which indicates a stronger effect.

The regression analysis also showed that when academic motivation and SRL are considered together motivation is made non-significant while self-regulated learning still remains significant which confirms that the latter is the stronger predictor.

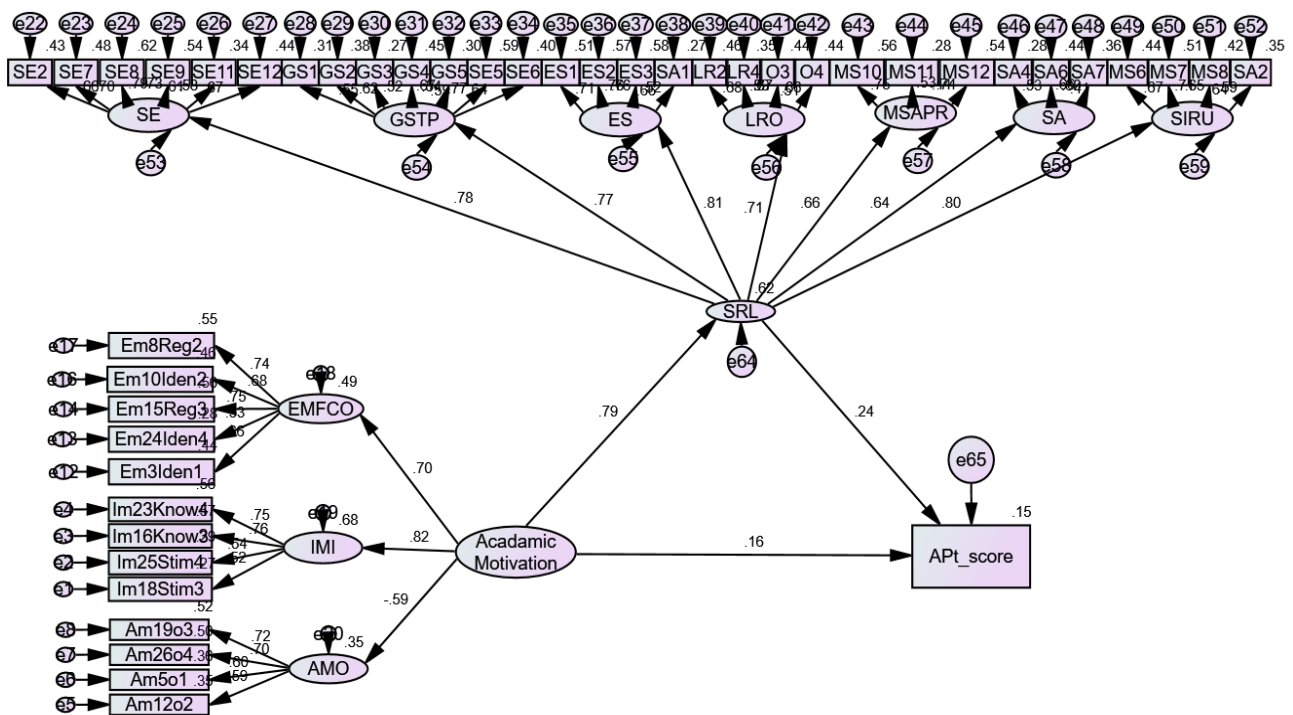
4.5. The Indirect Effect of Academic Motivation on Academic Performance Via Self-Regulated Learning

Further analysis was needed to understand the workings of the connection between the present variables, and therefore Structural Equation Modelling was performed to assess if self-regulated learning mediates the relationship between academic motivation and academic performance in order to answer the fourth research question. Number of factors achieved for the scales of both motivation and self-regulated learning through EFA were further validated and verified through CFA and so the modelling process began with constructing measurement level models for both variables followed by a second order model then a mediation model.

After checking how well the measurement level and the second order model performed for both scales, the models were combined and assessed using bias corrected interval bootstrap with 5000 samples to test the mediation model. The model showed marginal fit: $\chi^2(933) = 1448.036$, $p < 0.001$, CFI = 0.89, TLI = 0.88, RMSEA = 0.04, SRMR = 0.05.

The reduction of model fit indices values observed in the mediation model may be explained by the increase in model complexity as more parameters are added or estimated making the model less parsimonious as one moves from measurement model to second order model and then to the mediation model (Murray and Johnson, 2013).

Figure 2: Mediation Model



The SEM analysis revealed that the direct effect of academic motivation on academic performance was minimal and not statistically significant ($\beta = 0.16$, $p = 0.285$). However, the total effect of 0.351 is significant ($p = 0.001$) which shows that academic motivation has some positive influence on academic performance. Direct effect of self-regulated learning to performance was likewise not significant ($\beta = 0.24$, $p = 0.146$). Additionally, there was no significant indirect effect of academic motivation on academic performance through self-regulated learning ($\beta = 0.190$, $p < 0.129$, 95% CI [-0.080, 0.425]), suggesting that Self-regulated learning does not mediate the relationship between academic motivation and academic performance in this sample. Table 16 summarizes the observed direct, indirect and total effects.

Table 16: *Direct, Indirect and Totals Effects*

Path	β (Regression)	P (Regression)	Coefficient (β)	95% CI	p
AM→ SRL	-	-	0.786	[0.66, 0.884]	.001
SRL → AP	.262	<0.001	0.242	[-0.109, 0.513]	.146
AM → AP	.114	.078	0.161	[-0.138, 0.527]	.285
AM → SRL→ AP	-	-	0.190	[-0.080, 0.425]	.129

*Note:*AM= Academic Motivation; SRL = Self –Regulated Learning; AP = Academic Performance.

4.6. Differences in Academic Motivation, Self-Regulated Learning, and Academic Performance with respect to demographic variables

This section assesses differences in the three main variables as a function of the demographic variables. Seven demographic variables were considered, these include age, gender, school type, father’s education, mother’s education, family structure and grade level.

To assess the differences in academic motivation, self-regulated learning, and academic performance as a function of age, which was obtained through documents and self-reported, one-way ANOVA was carried out. Assumption of homogeneity of variances was violated for academic motivation only, as Levene’s test was significant $F(7, 308) = 3.622, p < 0.001$. Therefore, Welch’s ANOVA was performed and the analysis revealed statistically significant differences in academic motivation with respect to age, $F(7, 17.67) = 5.21, p = .002, \eta^2 = 0.103$ suggesting that 10.3% of the variance in academic performance was due to age which is a medium effect. Games Howell post hoc test shows that 18 year olds showed significantly lower academic motivation scores than their younger counter parts though one case was excluded from this analysis due to having small group size. The mean scores of 14 year olds were also found to be higher ($M = 2.30, SD = 0.36$) followed by 15 year olds while 18 year olds had the lowest mean scores ($M = 1.66, SD = 0.72$). On the contrary, no statistical

differences were found in self-regulated learning and academic performance due to age $F(7, 308) = 1.18, p = 0.312$, and $F(7, 308) = 1.32, p = 0.239$.

Differences in academic motivational levels with respect to gender were assessed through independent samples t-test which found statistically significant differences in the distribution of academic motivation between female participants ($M = 2.08, SD = 0.62$) and male participants ($M = 1.80, SD = 0.65$), $t(315) = -3.868, p < .001$, Cohen's $d = -0.42$, which is moderate and indicates that females reported greater academic motivation than male students.

Similar results were obtained in terms of gender differences with regards to SRL. The independent samples t-test shows that there were statistically significant differences in SLR across gender $t(315) = -2.432, p < 0.001$, Cohen's $d = -0.26$. Females had higher mean score ($M = 84.29, SD = 14.19$) than males ($M = 80.21, SD = 15.66$) which suggests that females exhibited greater self-regulated learning than males though the effect size is somewhat small.

In the case of academic performance, though females' performance t-scores retained a slightly higher mean score ($M = 50.88, SD = 9.68$) over males ($M = 48.99, SD = 10.28$), the independent samples t-test found that there was no statistically significant difference between males and females in terms of Academic Performance $t(315) = -1.680, p < 0.09$. Overall these results demonstrate that females tend to display higher motivation and SRL behaviours. Unequal variance assumed statistic was interpreted as Levene's test was not significant for all three variables.

To investigate differences in the three main variables with regards to school type independent samples t-test was conducted. Equal variance was assumed for academic motivation but Levene's test was significant for self-regulated learning and academic performance $F(1, 315) = 6.77, p = 0.010$ and $F(1, 315) = 5.42, p = 0.02$. Findings from the test indicate that there was significant differences in academic performance, $t(275.03) = -$

6.71, $p < 0.001$, Cohen's $d = 0.77$ with respect to school type. Mean scores suggested that private school participants reported higher academic performance ($M = 72.15$, $SD = 14.02$) with the effect size indicating that the mean difference was substantial. However, no significant differences were found for academic motivation $t(315) = 1.22$, $p = .223$ and SRL $t(314.82) = -1.90$, $p = .058$.

One-way ANOVA analysis results for academic motivation point out that there are no significant differences across father's educational profile $F(4, 312) = 0.180$, $p = 0.948$. Welch's ANOVA was conducted to see differences in SRL and academic performance since Levene's test was significant $F(4, 312) = 3.82$, $p = 0.005$. The analysis revealed statistically significant differences in academic performance as a function of father's educational level, $F(4, 92.672) = 7.086$, $p < 0.001$, $\eta^2 = 0.86$, while no significant differences were found in the case of self-regulated learning $F(4, 85.46) = 1.81$, $p = 0.134$.

Post hoc comparisons using the Games Howell analysis and mean scores exposed that participants whose fathers had no education academically performed lower than those whose fathers held a degree or higher ($p < 0.001$). Likewise, significant differences were found between no education and high school vs. degree and above ($p < 0.001$), elementary vs degree and above ($p = 0.047$) and diploma vs. degree and above ($p = 0.009$) with the later consistently showing higher results. Mean scores also confirmed this and showing that students whose fathers have degree and above performed better ($M = 53.37$, $SD = 11.35$) than those with fathers with less education. Similarly participant whose fathers had degree and above reported higher levels of self-regulated learning with higher mean scores despite not being statistically significant while those whose fathers had no education seemed to have higher mean scores.

Similarly, the ANOVA found no significant differences in academic motivation $F(4, 133.12) = 1.686, p = 0.157$ and SRL $F(4, 312) = 1.55, p = 0.18$ by mother's educational level, despite this, mean scores for academic motivation suggested that participants whose mothers received no education reported higher motivation scores ($M = 2.09, SD = 0.45$) In contrast, mean scores for SRL showed that students with mothers who had diploma scored relatively higher than those in the other groups ($M = 84.90, SD = 15.77$).

The same analysis observed that there were statistically significant differences in academic performance $F(4, 312) = 5.66, p < 0.001, \eta^2 = 0.06$, with the Games-howell post hoc test suggesting that differences in performance exists between participants whose mothers had degree and above group and those with comparatively less education or no education at all, from ($p < 0.001$) to ($p = 0.02$) aside from those with diploma which was not significant. Mean scores also note that students whose mothers are degree and above holders tend to perform higher academically speaking ($M = 53.77, SD = 10.04$) followed by diploma holders ($M = 50.39, SD = 11.14$). The eta squared indicated that this mean difference was moderate.

Statistically significant differences were found for both academic motivation and SRL as a function of family structure $F(3, 313) = 2.79, p = 0.04, \eta^2 = 0.026$ and $F(3, 313) = 5.20, p = 0.002, \eta^2 = 0.047$ respectively, though the post hoc tests showed no significant differences between the family structure groups despite the fact that the participants living with guardians seemed to report higher levels of academic motivation and self-regulated learning. Mean scores also confirmed this ($M = 2.11, SD = 0.57$) and ($M = 84.61, SD = 14.19$). On the other hand, the One-way ANOVA found no significant differences in students' academic performance with regards to family structure $F(3, 313) = 2.54, p = 0.056$.

The one-way ANOVA indicated statistically significant differences in students' Academic Motivation $F(3, 313) = 9.95, p < 0.001, \eta^2 = 0.087$ and Academic performance $F(3, 313) =$

7.10, $p < 0.001$, $\eta^2 = 0.064$ as a function of grade level, while no significant differences were found for Self-Regulated Learning $F(3, 313) = 0.92$, $p = 0.43$. Post hoc comparisons using the Games-Howell showed that differences in academic motivation exist between grade 9 students and grade 12 students in terms of motivation scores ($p < 0.001$), with mean scores revealing that 9th graders had higher motivation scores ($M = 2.18$, $SD = 0.52$) followed by 10th graders, and that differences in Academic Performance existed between 9th and 11th graders ($p < .001$) similar significant differences also existed between 11th graders and the other grades. Mean scores for academic performance revealed that 11th graders performed better academically than the other grades ($M = 54.14$, $SD = 8.80$) followed by 10th graders ($M = 49.88$, $SD = 9.82$) with the lowest performance coming from 9th graders. 12th had the lowest motivation and SRL scores.

Table 17: ANOVA and T-test Results

Demographic Variable	Test Used	Outcome Variables	df	Test Statistic	p
Age	ANOVA	A.M	7,17.67	5.21	.002
		SRL	7,308	1.18	.312
		A.P	7,308	1.32	.239
Gender	T-test	A.M	315	-3.868	<.001
		SRL	315	-2.432	<.001
		A.P	315	-1.680	.09
School Type	T-test	A.M	315	1.22	.223
		SRL	314.82	-1.90	.058
		A.P	275.03	-6.71	<.001
Father's Education	ANOVA	A.M	4,312	1.180	.948
		SRL	4,92.67	7.08	.134
		A.P	4,85.46	1.81	<.001
Mother's Education	ANOVA	A.M	4,312	1.68	.15
		SRL	4,312	1.55	.18
		A.P	4,312	5.66	<.001
Family Structure	ANOVA	A.M	3, 313	2.79	.04
		SRL	3,313	5.20	.002
		A.P	3,313	2.54	.056
Grade	ANOVA	A.M	3, 313	9.95	<.001
		SRL	3,313	0.92	.43
		A.P	3,313	7.10	<.001

4.7. The perspectives of the school community on how students' motivation and self-regulated learning relate to academic performance

Non interactive group interview data and one on one interview responses provided by the participants were transcribed and thematically analysed, and reported for the qualitative section of this research. The main aim of the qualitative section is to answer the sixth research question which asks: What are the school community's perspectives on how students' motivation and self-regulated learning relate to academic performance? It answers this at the end of the section. In addition to this, the qualitative part aims to discover how participants stay motivated and delve deeper to understand the self-regulated learning strategies used by them. In doing so it hopes to provide information that supplements the findings of the quantitative part of the research.

Table 18: *Profile of interview Participants (students)*

Code	Role	Gender	School Type	Grade Level	Performance
P1	Student	Female	Private	9	High
P2	Student	Male	Private	10	Average
P3	Student	Male	Private	11	High
P4	Student	Female	Private	11	Average
P5	Student	Female	Private	12	Average
P6	Student	Male	Private	12	Low
P7	Student	Male	Government	12	Low
P8	Student	Female	Government	11	High
P9	Student	Female	Government	11	High
P10	Student	Female	Government	10	Average
P11	Student	Male	Government	9	High

P12	Geography teacher	Male	Private	-	-
P13	Math teacher	Male	Private	-	-

Theme 1 : Type of Motivation

When asked what motivates them to perform well, participants indicated several factors that motivate them, both external and internal. They generally reported that they were motivated by their families (expectation or involvement), future aspirations and goals , seeing successful role models , fear of other people’s devaluating them, teacher’s effort, interest to learn new things or personal effort in their education and finally some students indicated that they weren’t motivated or interested in their education. These patterns suggest that most of the interviewed participants are extrinsically motivated, while some are intrinsically motivated and the remaining few are amotivated. These findings confirm the results of the quantitative analysis.

Participant 1, a female private school high performer reported :

I don’t know how but I was like... a good student as a child and my father always encourages me so I felt that was a good thing then I kept up with it till now and it satisfies me to know new things .. to learn... my mother also motivates me. They are both really supportive. I like their support and I see how they are working hard to put me in this position so I don’t wanna fail them but also I love knowing new things”

Participant 9, a female government school high performer also stated :

I'm motivated by a lot of things. Number one, the energy and effort that I expended on my education motivates me , next, the effort that my elementary teachers made for me and motivational techniques they used... my family also has expectations for me to get good grades , I also like learning knew things ... so these are the things that motivate me.

In contrast to these statements low performers in both the government and private schools stated that they were not interested in their education and felt that they had other options of securing their future personal success. All three of the participants who stated this happened to be male. Two of them were government school students and one was a private school student.

Participant 7, a male government school low performer said:

I don't have interest... since I failed in school before... I don't expect to find good things or success through education and since I'm not that good in school... I also have other options.

Theme 2 : Maintaining Motivation Levels

When faced with difficult concepts the participants demonstrated that they may ask teachers (while one commented that he didn't bother doing so because he felt uncomfortable or unwelcomed), use references through books or online. Another indicated that she procrastinates when she faces difficult concepts and yet another claimed that he views it all as transient. Persistence was also noted in a participant who described that she pushes on to face these challenges head on. These patterns hint that some of the participants faced their

academic challenges head on through some strategies (referring to books or teachers) while others lost their motivation which led them to become passive or avoidant.

Participant 5, a female private school average performer declared:

I kind of procrastinate a little bit and then may be try to get in to it and force myself to do it.

Participant 4, a female private school average performer:

I overcome it by.. I just push on or if I want I study a lot. To be honest, I've never encountered such difficult concepts.

Participant 9, A female government school high performer:

When I encounter difficult topics , I usually expect a lot from teachers but when I still don't understand I ask my friends and they explain it in easy Amharic , next, if that doesn't solve the problem I head to google and search out the concepts that are difficult for me .

The patterns indicate that in order to handle monotony that may arise out of academic tasks the students tend to visualise their future goals or the consequences of giving up to keep themselves going. This shows that those who reported this understand that their future depends on their current actions and use it to motivate themselves. Other participants stated that they tend to take breaks and return to studying afterwards or just leave it. Taking short breaks in between strenuous mental activity when a drop in concentration is noted is a good and healthy strategy to refresh the mind that is used in promodoro strategies.

Participant 3, a male private school high performer:

I think about my future goals , where I'll be in 10 years from now , where my visions for the future are and what happens 10 years from now depends on what I do now. If I work hard now , 10 years from now things may be good so I motivate my self in such a way.

Participant 4, a female private school average performer replied:

Even if I'm bored I recognize that it's not something I can just leave. Like if I got bored and left it and failed the consequences of that will have a very sad ending, but even if I'm bored and I just keep on reading without giving up, that will create change .

Theme 4: Goal setting

Findings showed that with regards to goal setting the participants, though most of them indicated that they set goals, failed to write them down and some indicated that they may or may not end up achieving them. They also reported that they didn't set academic goals that are specific enough. Specific organised set of goals would allow them to detail what they wish to achieve point by point and how they can achieve it. These goals would usually be categorized by time (short term or long term) and complexity (setting small manageable goals) and detailed in order to indicate directions of how to attain them. Some of the participants also reported that they didn't set goals at all or that they didn't set goals tied to their academics.

Participant 8 , a female government school high performer :

Yes I set goals... but I don't use them much because some times for example I may stay here late when assignments have been given or I may have some other work to do at home, at times like these I may not use them but I do set them.

Participant 1, a female private school high performer :

I don't necessarily write them down but in my mind... for example in the first quarter my maths result was a little bit low so I told myself that I need to improve it. I wrote the strategies actually. Generally for the subjects I got good grades in I say oh... I need to keep up with this , I need to follow the same paths and if they are low I ask myself what the problem is here and what I should do in order to solve that problem .

Participant 2, A male private school average performer stated :

I just started to do that this quarter. I set goals based on what I study , like if there is a schedule , like if I'm studying on Monday I set goals for what I need to know from that session. I may also create an alternative plans but not for my academics.

Theme 5: Study strategies

Qualitative findings reveal that the students seemed to be lagging in terms of study strategies. They have made mentions of using some association techniques as in participant 3 who used sound associations to help him remember what he studies. Another participant mentioned that she that visuals helped her more. A common element here was that the memory strategies the students described weren't deep memory strategies that allow learners to take up information, digest it and attach it to long term memory. Another common element

was the lack of awareness of other learning strategies that may help make their learning more effective and efficient as well as improving their performance.

Participant 3, a male private school average performer:

What I use is this military technique, a technique that they use in the military to help them know new things, for instance like they study with sound, you know like classical music... so they may use this to study and so whenever they listen to this music it is what they studied that pops up in their mind. So they use this association. This is what I use.

Participant 4, a female private school average performer:

When I study what I do is memorize. I just simply read until I understand. If I understand it I will move on if I don't, I just read it, I don't know but it makes sense to me. Other people usually write what they want to remember and stuff like that but for me writing some thing down is like purging out all my knowledge. I just read it I don't repeat it but if I don't understand I repeat it and try to understand it for instance you use cramming or if it's a subject that requires cramming I use word associations but for like math I just read it and do exercises.

Participant 9, a female government school high performer:

What I usually use is, since I 'm a visual learner I usually look at visual representations and also there's another technique that I noticed though I haven't applied it.

Participant 6, a male private school low performer :

If I do study , I only study during exams , like a day before the exam or a night before the exam.

Theme 6 Time management

Time management is an important skill within self-regulated learning. Students often need to balance assignments or manage their course load which is assisted by effective time management. The responses of the participants signify that the participants lack time management skills. They don't know how to deal with distractions that drive them away from what they are supposed to do at a certain time and at least one participant responded that she struggled with procrastination as an answer to another related question.

Participant 2 ,a male private school average performer

My time management is some times good sometimes bad. But there is distraction like ... play station, but what's good now is that since my mother has taken my phone away the game no longer distracts me. Some times I plan to study here but when I come here I say I'm going to study at home but when I get home, at the door , you know like something just pushes you towards electronics (phone) so I get distracted.

Participant 10, a female government school average performer:

If like someone made an appointment with me I get there on time but like when an assignment is given, if we are given several home work at the same time then I cant.

Theme 7: Overcoming academic challenges

Different types of difficulties and ways of handling them were reported by the participant revealing that some students may deal with challenges in healthy proactive ways while others have a hard time coming to terms with it.

Participant 9. A female government school high performer:

When I'm faced with such a situation, for instance in the ninth grade, there were a lot of situations, and disturbances at school and due to that we were lagging behind and I overcame it by covering the topics by myself with my friends through my own effort.

Participant 11, a male government school high performer

When I registered at this school, I came from another school, when I came from my old school they did not give me my certificate so they made me repeat a grade and I have not overcome that yet

Theme 8: The perspectives of the school community on how students' motivation and self-regulated learning relate to academic performance

All students agreed that self-regulated learning is a necessary skill to cultivate which helps enhance academic achievement while they held varied views on academic motivation with two students suggesting that discipline was more important.

Participant 8, female government school high performer

To begin with , it is when you study with motivation that you can understand better. It cant happen through external push.

Participant 3, male private school high performer

For me personally, I don't think motivation is that important, discipline is what we need. If we have discipline it won't matter whether we depressed, happy, sad or offended we will do what we have to do but with motivation we may only work for something when we feel like it and stop when we don't feel like it. If we want to achieve something I think discipline is important. Another thing, Self-regulated learning is important.

Participant 12, male geography teacher:

It's scientific (referring to how motivation and self-regulated learning relate to academic performance). if students lead the time they spend in school and home in a structured manner it may lead them to success... this is what most students lack, in fact instead of using their time for this they look for their own self perceived alternative paths.

Chapter Five

Discussion

In this section, the results reported in chapter four are discussed in detail and interpretations are offered within the context of empirical evidence and existing literature. It has five parts, each of which offers response to the research questions elaborating on and explaining the findings. The first part discusses the the levels of the main variables, the second part oversees the observed relationship between these variables, the third covers the proportion of variance in the dependent variable explained by the independent variables, the fourth looks at the mediation analysis , and fifth part delves in to the demographic differences. The qualitative part is also incorporated and compared with the quantitative discussion .

5.1. Levels of Academic Motivation, Self-Regulated Learning and Academic Performance among the Participants

As item mean scores show, the findings revealed that students had moderate to high academic motivation scores indicating that they were somewhat motivated. This suggests that the participants are interested and curious about their academics or have some external prompts to push them forward and promote their excitement towards their education which helps in creating optimal drive or eagerness required for exerting and sustaining greater academic effort.

The descriptive statistics also revealed that students were slightly more externally motivated with extrinsic motivation – future career oriented showing the highest mean. This suggests that the participants maybe more motivated by their future career prospects and status as the items indicate. In developing countries and collectivist societies, economic survival and family reputation maybe important as the students try to escape poverty or be

economically competitive and stable. They may not have the resources and tools that help them cultivate better understanding and love of their education. They may also worry more about supporting their families and attaining better status. Their cultures may also not be supportive in cultivating intrinsic motivation as some western cultures that have established a long standing tradition of reasoning and scientific discourse. The educational context may also play a role as learning environments that are learner centered and create engaging content may help in cultivating and promoting interest. Such cross-cultural differences are observed in some cross cultural comparative studies, Zhaoq Zhang, et, al (2024) compared Chinese and Dutch students and found that though autonomy was equally important for both groups Chinese students responded better to external rewards on memory performance.

The qualitative findings also confirm this result in that many of the participants reported that they were motivated by external factors. Culturally speaking, and anecdotally, learning in Ethiopian context is viewed as a means to an end rather than a cognitive activity taken up for the sake of itself as in some western societies. This indicates that students in Ethiopia may be more motivated by external rewards like financially supporting their family, career prospects or escaping poverty, the first two of which were highlighted by the participants. On a policy level and educational contexts, there are limited policies and classroom practices that promote the cultivation of intrinsic motivation and self-regulated learning.

Intrinsic motivation - interest driven trails closely behind which shows that the motivational profile of the participants is not one dimensional and that they also enjoy their academic tasks out of real interest but to a lesser extent when compared to external drives. Amotivation on the other hand, had the lowest level. This was consistent with the qualitative findings, where for instance, three of the participants indicated that they were amotivated, two of whom were government school students while all three were male. This indicates that out of the interviewed participants, all the females were somewhat motivated. The same also

applied to self-regulated learning. Overall, the level of motivation revealed through the findings may reflect a decent amount of personal investment in learning within the sample.

The results align with previous studies, Mutweleli (2014) reported moderate to higher range of motivation levels among students in another developing country. Contrary to this finding, Ayele (2020) found that 67% of the Ethiopian students in his sample showed low to moderate levels of motivation in a similar educational setting. He further noted that from a theoretical perspective age or developmental stage could explain lower motivation levels of students.

Similarly, in the current study, 67.2% of the sampled students had average self-regulated learning scores. Such levels of SRL suggest that only basic learning strategies are employed by students, with them exhibiting limited ability to regulate and manage their learning processes. In the qualitative part, students indicated they used some less refined and organised self-regulated learning strategies like cramming, word, sound, and visual association and repetition. They also indicated that they lacked knowledge of the existence of other strategies that promote deep learning.

Further quantitative analysis showed that out of the seven self-regulated learning strategies indicated in this study, the participants reported higher self-evaluation strategies followed by Structuring information and resource use while the lowest rating was for memory strategy-active practice and recording. This trend could suggest that although students display capacity to accept feedback, structure and curate their learning materials, they may have some limitations with regards to strategies of recall and retention. They may also have difficulties of holding themselves accountable for their learning and asking for intellectual support when needed as their scores on learning responsibility & organising and seeking assistance were likewise slightly low. A similar finding was reported by Tadesse et al.,

(2022) in a study done on undergraduate students in Ethiopia. The qualitative analysis also supported this finding; in that the participants may be facing issues related to memory and organising because they didn't use strategies that cultivate deep learning and many of them also failed to use organisational tools that allow them to plan, structure and track their progress.

Consistently with this finding, Mutweleli (2014) also observed moderate SRL scores, however, in that particular study Memory Strategy received the highest mean score. In another study, Ayele (2018) noted that SRL needs work in Ethiopia, as on policy level, despite emphasis on equal educational access, no provision was offered for cultivating skills like Self-Regulated Learning which he advocated.

The Academic Performance of the participants was likewise observed to be average. Mutweleli (2014) also found the same results. A possible justification for the submaximal performance could be that the educational and cultural environment emphasizes blind rule following and compliance rather than self-initiative.

5.2. Relationship of Academic Motivation, Self-Regulated Learning and Academic Performance

The findings revealed that academic motivation and self-regulated learning were positively and significantly correlated to Academic Performance. It was also found that the two independent variables were significantly positively correlated to one another. This implies that the students with higher Academic Motivation also employ more successful Self-Regulated learning strategies which in turn contribute to better Academic Performance. This was consistent with other findings (Lee & Stankov, 2018; Ayele, 2020; Mutweleli, 2014; Zimmerman & Schunk, 2011; Tigist, 2013; Gracia & Pintrich, 1991). The qualitative findings somewhat confirmed these quantitative results as some of the participants expressed that

academic motivation and self-regulated learning were crucial to academic achievement. They stated that without motivation they won't be able to find the drive that fuels their academic performance and that likewise self-regulated learning made significant contributions.

Further correlations to see which types of academic motivation and domains of SRL were correlated with academic performance and with one another outlined that intrinsically motivated students performed well academically, with the highest observed positive correlation, which was consistent with Mutweleli (2014).

Extrinsic motivation- future career oriented were also found to be related to academic performance to a slightly lesser extent indicating that students who are extrinsically driven to achieve by the promise of better work opportunities or options also perform in their academics.

In contrast, Amotivation or students' indifference, non-intentionality and lack of drive towards their education was negatively associated with higher performance, Ryan & Deci (2000), which is self-evident because students who don't invest the necessary time and effort on their academic tasks may not be able to master those tasks in order to attain or maintain higher performance. This was also further confirmed by (Mutweleli, 2014).

In the qualitative analysis, it was likewise observed that the participants who expressed themselves as intrinsically motivated were high performers while the amotivated students tended to be low performers.

As for Self-Regulated Learning, the analysis also found that participants who were motivated to know more and broaden their intellectual horizons made better use of strategies like rehearsing, summarizing, and grouping information based on patterns. They also seemed to be more engaged in the process of assessing and reviewing the quality of their academic

work and effort in order to improve and achieve higher. Amotivation, on the other hand, was found to be negatively associated with all the Self-Regulated learning strategies. This seems intuitive because students who lack direction, intensity of intention or effort in their academic work, and fail to persist in the face of challenges are less likely to invest time and effort in curating learning strategies designed to promote the success of their performance on their academic tasks.

The qualitative part of the study also revealed that the high performers, who were generally more motivated, also tended to use more and better learning strategies as well as tools that help them organise their studies whereas the amotivated students seemed to lack the desire to invest themselves in such endeavours.

5.3. The proportion of variance in Academic Performance explained by Academic Motivation and Self-Regulated Learning jointly and independently

Variance explained by each of the independent variables in the dependent variable was also investigated in the current study. The term “variance explained” represents how much differences in the outcome variable may be due to the predictors.

The coefficient of determination and the squaring of part correlations in the analysis revealed that, jointly, the independent variables explained 10.1% of the variance in the dependent variable, indicating a modest but meaningful association. Independently, academic motivation accounted for 6.6% of the variance, while self-regulated learning explained 10.4% of the variance. Uniquely, academic motivation explained 0.9% of the variance and self-regulated learning explained 4.6% of the variance. This means that out of everything that influences differences within the academic performance of students 0.9% (which is almost 1%) and 4.6% is uniquely due to academic motivation and self-regulated learning

respectively without factoring in any shared variance. Despite the fact that these proportions seem somewhat small they imply that each of the independent variables contributes in influencing the dependent variable. Cohen (1988) points out that, in behavioural and social sciences, such modest values of R^2 values are not uncommon, especially when assessing complex psychological concepts. These results suggest that a considerable portion of variance remains unexplained, possibly accounted by other factors not encompassed in the model.

In the qualitative findings, the fact that the high performers expressed greater motivation and use of strategies while the low performers showed lack of motivation and less use of learning strategies hints that academic motivation and self-regulated learning may contribute or may be linked to the differences observed in their academic performance.

The quantitative findings are consistent with prior research suggesting that though motivation is necessary, it may not directly influence academic outcomes unless supported by effective learning strategies (Floris et al., 2023; Ayele, 2024). Similarly, in an African sample from Nigeria, Inoru (2024) found that extrinsic motivation explained only 3.8% of the variance in academic performance while intrinsic motivation was limited to 0.3%.

On the other hand, a recent study, by Ayele, (2020), which also investigated the variance explained, found that academic motivation and age explained 28.6% of the variance in academic performance in selected high schools in Addis Ababa. In another study by Abdela and Alemu (2023), investigating the relationship between self-regulated learning strategies, motivational beliefs and academic performance with an Ethiopian sample found that SRL explained 12.8% while motivational beliefs explained 23.4% of the variance in academic performance, and contrary to the findings of the current study, Shukla (2023), with an Indian sample, also found that academic motivation explained 35% of the variance in academic performance.

5.4. The Indirect Effect of Academic Motivation on Academic Performance Via Self-Regulated Learning

Structural Equation Modelling (SEM) was conducted in order to assess the role of self-regulated learning in the relationship between academic motivation and academic performance. The results reveal that both direct paths from academic motivation to academic performance and from self-regulated learning to academic performance as well as the indirect effect between the three variables with self-regulated learning as a mediator were not significant while the path from academic motivation to self-regulated learning was significant signifying that these variables were associated.

These findings indicate that in this sample, although academic motivation positively predicted and related to self-regulated learning and academic performance, a link also confirmed through the significant regression and correlation results, their relationship may not operate in specific mediated sequential path. It is possible that other unmeasured variables may also mediate these relationships. The direction of effects remains consistent across methods, confirming that the predictors are positively associated with academic performance even when individual paths are not statistically significant in the SEM model.

The lack of multicollinearity and the independent variables being only moderately correlated implies that the measures are statistically distinct. However the constructs may operate in similar ways to influence the outcome or they may operate through other untested mechanisms. Thus the mediation being non-significant likely reflects the true structure of the relationship in this sample.

The results show that academic motivation significantly predicts self-regulated learning, but this self-regulated learning did not, in turn, significantly predict academic performance in the model. This implies that academically motivated students in this study likely maintain and

employ some set of self-regulated learning strategies to recall information , set plans and goals , organise materials or environment , assess their performance , analyse their task, and manage their time but these strategies alone may not have translated into measurable academic gains within this sample. Zimmerman (2002) denotes that Self-Regulated Learning helps facilitate motivational beliefs to turn in to better grades; however, this process may depend on contextual or individual factors not captured in the present study. Thus, although the theoretical framework of self-regulated learning remains supported in terms of directional relationships, the statistical evidence here suggests that motivation's impact on achievement is not significantly mediated by self-regulated learning.

5.5. Differences in Academic Motivation, Self-Regulated Learning, and Academic Performance with respect to demographic variables

This section discusses and interprets the findings related to the differences in academic motivation , self-regulated learning and academic performance due to demographic variables. The seven demographic differences discussed are gender, age, school type , father's education, mother's education, family structure , and grade level.

Welch's ANOVA was used to analyse differences in academic motivation, self-regulated learning and academic performance with regards to age along with post hoc comparisons. The analysis revealed significant differences in academic motivation due to age and the post hoc comparisons identified that older adolescents in the sample tend to be less motivated. Existing research shows that there is a decline in academic motivation during adolescence (Eccles &Midgley, 1989) as hinted in the literature review. This could be due to the changes that take place during this developmental period and distractions that modern society offers that this age group is susceptible to which make academics take less precedence or it could be because the academic setting doesn't create a conducive environment that motivates students to learn.

The test further revealed no significant differences in SRL and academic performance due to age. The results could be owing to the fact that the age gap between sampled 14 to 22 year olds might not be big enough to show any noticeable development or changes in self regulated learning and academic performance. This is coupled with the fact that they were all sampled from a high school environment. These findings are contradicted by studies that show differences in level of self-regulated learning and academic performance as students grow older (Schunk & Ertmer, 2000; Shallice & Burgess, 1996).

Significant gender differences in academic motivation and self-regulated learning were found using independent samples t-test. Mean scores showed that female participants were more academically motivated and better self-regulated learners than the males. These differences may be due to cultural norms of how girls are seen and rewarded within society that reinforces their motivation and self-regulated learning behaviours. Culturally speaking, females are expected to be more responsible and organised which strengthens their self-regulated learning behaviours.

The qualitative results likewise showed that all three of the participants who expressed that they lacked desire and motivation towards their education were all male and the female participants also conveyed more use of self-regulated learning strategies.

There have been other researches that found females as more motivated than males and tend to apply more self-regulated learning strategies that allow them to structure their settings, plan, organise, and self-evaluate (Subekti, 2025; Zimmerman & Martinez-Pons , 1990 ;). On the contrary (Mutweleli, 2014) found that boys were more academically motivated than girls and likewise more self-regulated.

With respect to academic performance , despite the fact that mean scores indicated that females performed better the independent samples t-test revealed no significant gender

differences in academic performance . This was consistent with (Mutweleli, 2014) who also found no significant gender differences academic performance.

The current study also assessed differences in academic motivation, self-regulated learning and academic performance as a function of school type after collecting data on the three main variables and the respective demographic variable. Independent samples t-test was used for the analysis which found no significant differences in academic motivation and SRL levels across school types while mean scores were higher for participants from private schools for the later but this observed mean score difference might not have been large enough to be significant. On the contrary other researches, though limited, have pointed out how school type is important in the case of both motivation and self-regulated learning (Perry et al., 2016 ; Walton & Cohen, 2011).

In terms of academic performance, the analysis found significant differences across school types. A look at the mean scores revealed that the private school had higher mean score in comparison to the government school suggesting that the students of the former had higher performance than those in the latter. The explanation could be that the private school had more resources or budget and offered a more academically intensive environment than that of the government school as others have pointed out that such an environment may contribute to better performance. (Chubb & Moe, 1990).

In order to answer the question of what differences exist in academic motivation, self-regulated learning, and academic performance as a function of parental education, one-way ANOVA and Welch's ANOVA were utilised. Surprisingly, the tests, as shown in the results section, revealed no significant differences in terms of academic motivation and self-regulated learning . These findings were echoed in the case of mother's educational level which also showed no significant differences. Research has shown that parents who are well

educated tend to create conducive encouraging environments for their child's intellectual development and academic success providing resources that enhance both motivation and self-regulated learning (Hidayatullah & Csikos, 2023; Zimmerman, 2002). In light of these studies, one justification for the current research results could be that differences in parental education could be offset due to other factors that may be more directly associated with how students develop motivation and SRL.

Significant differences in academic performance were observed as a function of mother's education and father's education. It is well established that parents play a major role in shaping their child's learning and achievement with their involvement (Davis-Kean, 2005). Parents who are less educated are less likely to actively involve themselves in their children's academics, whereas parents with more education may be intellectually well equipped to offer assistance in addition to acting as a role model. They may actively help tutor their children and offer the necessary materials or opportunities as they know the experience and may have the required ability to handle it. This support may assist the students to perform well.

Differences in academic motivation, self-regulated learning and academic performance were also investigated using one-way ANOVA which identified significant differences in academic motivation and self-regulated learning while no differences were found in academic performance as a function of family structure.

Participants living with guardians reported higher levels of academic motivation and self-regulated learning than their peers within the sample, while in contrast, in another study, students living with one parent exhibited higher levels of motivation followed by those in nuclear families (Shabnam, 2023). In relation to this, it was also observed through participants' responses in the qualitative analysis, that having parents or parental figures who

support them academically and create conducive environments was a highly motivating factor that also encouraged them to employ self-regulated learning behaviours.

Significant differences in academic motivation and academic performance due to grade level were noted through the one-way ANOVA test, while no significant differences were detected in self-regulated learning as stated in the results section. This indicates that academic motivation and academic performance levels change across grade level. The post hoc pairwise comparisons delve deeper and provide the necessary information on where the difference is. The fact the 9th graders and 12th graders differed in motivation level across grade level could mean that the 9th grade students being new to the experience of high school were less burdened by academic tasks than in the advanced grades facing standardized examinations, while 12th graders' low motivation could be due to increased pressure that comes as with the advancement of school and standardized examinations like the ESSLCE which could lower motivation levels.

With regards to Academic performance, 11th graders had the highest mean rank while 9th graders (the most motivated of the bunch) had the lowest academic performance mean ranks. 9th graders, though not facing external standardized examinations may be unprepared for the taking up the burdens of academic task loads as they are new to high school.

Chapter six

Summary, Conclusions, and Recommendations

6.1. Summary

The main aim of the study was to assess how academic motivation, self-regulated learning and academic performance are linked within two schools in Addis Ababa. The specific objectives of this particular study were to evaluate the level of the three main variables, investigate the relationship that exists between them, determine the variance explained by the independent variables within the dependent variable, check if self-regulated learning mediates the relationship between academic motivation and academic performance through inspecting the direct and indirect effects, the study also assessed demographic differences and lastly to explore the views of the school community on how academic motivation and self-regulated learning relate to academic performance.

In order to answer the research questions, the research assessed the data collected from two schools in Addis Ababa (Temnjayazh Secondary School and Dandi Boru). The first, a government school located in the Kirkos area, and the second, a private school located in the Bole area (Kirkos Sub city). Data was collected through self-report questionnaires with the Academic Motivation Scale and the Academic Self-regulated Learning Scale, while academic performance was gathered from official school records.

The study targeted 317 participants aged 14 to 22. The mean age was 16.71 with female participants being slightly more than male participants. EFA and CFA was performed identifying new factor structures. The data was analysed using the necessary statistical tests which included; descriptive statistics, Pearson correlation, multiple regression, structural equation modelling, Welch's and one-way ANOVA, and independent samples t-test.

To summarise the findings, the study began with the aim of revealing the levels of academic motivation, self-regulated learning and academic performance which were found to be average in the case of self-regulated learning and academic performance, while moderate to high levels of academic motivation were revealed.

After this, the study explored the relationships between these variables through a correlation analysis and found that all were positively and significantly correlated to one another.

The third analysis revealed R^2 in order to find the variance explained in academic performance by academic motivation and self-regulated learning. The findings indicated that academic motivation uniquely explained negligible or minimal variance in academic performance while self-regulated learning modestly explained the variance in academic performance independently.

The fourth aim of the study found no significant direct and indirect effects between the variables except for the significant direct effects between academic motivation and self-regulated learning indicating that self-regulated did not mediate the relationship between academic motivation and academic performance in this specific sample.

The fifth part of the study over saw the demographic differences within the three main variables comparing them across seven demographic variables. Significant differences were found in academic motivation across age groups but no significant differences were found in the case of self-regulated learning and academic performance.

In the case of gender significant differences were found for academic motivation and self-regulated learning while no significant difference was found with regards to academic performance.

In contrast, the findings revealed that there were significant differences in academic performance as a function of school type while with regard to academic motivation and self-regulated learning no significant differences were detected.

Across parental education profiles no significant differences were found for academic motivation and SRL but significant differences were revealed for academic performance. In contrast significant differences were observed only in the two independent variables across family structure groups.

Significant differences also existed in academic motivation and academic performance as a function of grade level, while no significant differences were identified in the case of self-regulated learning.

Finally the qualitative results probed deeper in to the matter to show what motivates the participants and how they apply self-regulated learning strategies finding that they were motivated to perform by a variety of factors and retained basic types of learning strategies. It also looked at their perspectives on academic motivation and self-regulated learning related to academic performance.

6.2. Conclusions

In conclusion, some of the findings indicate that higher academic motivation and self-regulated learning are valuable to securing higher academic performance and achievement which is in turn crucial to a successful and stable life. This makes them indispensable to students, as students need motivation to fuel their effort exerted towards their studies, and self-regulated learning to help them take up their learning independently in an organised and strategic manner which likely enhances their performance.

The observed levels of the three main variables being moderate to high, though good, indicate that there is still some room for improvement. The correlation and regression results suggest that these variables are associated to and influence one another and that abundance in one suggests higher performance in the others.

SEM results allow us to observe how these variables relate to one another after establishing their relationship through the correlation and regression and despite a marginal fit, the model revealed that academic motivation exerts a direct effect on self-regulated learning but does not apply a direct effect on academic performance nor does self-regulated learning mediate the relationship between the first and the latter in this sample. This suggests that there might also be other untested mechanisms at play like instructional quality, material resources, academic environment, external support, etc., which possibly moderate or influence the strength of the link between SRL and achievement. The consistent positive directions across analyses nevertheless support the underlying theoretical framework of the link between these variables.

Lastly, with regards to the levels of academic motivation, self-regulated learning and academic performance across the seven demographic variables, within this specific sample, older adolescents tend to display lower academic motivation. This could be due to several underlying factors that influence their motivation levels in these age groups that may be related to the developmental changes that take place during the particular developmental stage they find themselves in, possibly related to shifting priorities or increased external pressure.

Females also seem to have higher motivation and self-regulated learning which could arise because of differences in how they are socialised and the gender roles they are expected to take up.

With regards to school type, the private school students indicated higher academic performance which might be linked to better quality of instruction as well as greater access to educational resources and support. This suggests that educational contexts and economic circumstances play a role in assisting the performance of students.

Students with highly educated parents also performed better academically. These students may have the intellectual parental support and encouragement necessary for academic success.

One surprising finding was that students living with a guardian displayed higher levels of academic motivation and self-regulated learning which could stem from their circumstances. This defies preconceived ideas about "disadvantaged" groups and shows that non-traditional family structures may still promote academic success. This circumstance may offer the student greater autonomy and responsibility than in regular nuclear family arrangements. Research suggests that adolescents in such family structures develop coping strategies that make them self-reliant and goal-oriented (Miller et al., 2013). Guardians may also have stricter structure or expectations to compensate for the absence of biological parents (Brown & Iyengar, 2008).

Demographic differences were also like wise observed with regards to grade level indicating significant differences in academic motivation and academic performance. Lower grades may display higher motivation levels as the novelty of high school may create excitement though this may not translate in to grades as they are also new to the challenges of this stage in their academics whereas eleventh graders may perform better as they are not facing any national examinations that may lower their focus or assumption that they may get by just passing the national exam.

6.3. Implications and Recommendations

The implications of these findings are far-reaching. The results imply that these factors are, to some extent, interdependent developmental skills critical to a healthy development and success in numerous domains of life which enable adolescents and emerging adults to successfully transition in to adulthood.

The study hints that academic motivation and self-regulated learning are important skills to be developed which emphasizes the role of education in cultivating such habits. It endorses the notion that students can be instructed to motivate themselves and better regulate their learning and perform well in their studies, potentially enhancing not just their academic outcomes but their overall personal growth.

Several recommendations can be made based on the findings of this study. As the correlation established a link between the main variables and levels of self –regulated learning and academic performance are average while academic motivation levels range from moderate to high, schools can formulate interventions and age-appropriate strategies that target students and teach them how to regulate their learning to improve their performance and enhance their intrinsic motivation.

Policy makers and educators can pass and advocate educational policies and curriculums that help students in developing their motivation, learning strategies and academic performance. They could also help make appropriate resources and funding available for schools.

Given that females demonstrated higher academic motivation and self-regulated, which could be due to socialisation patterns as indicated before, educational programs might explore ways to encourage similar engagement in male students and resources should be provided and made accessible to government school students who under perform in their academics.

Teachers can integrate motivational and self-regulated learning skills training that include lessons that focus on cultivating these skills helping their students enhance their autonomy , relatedness , competence and learning strategies.

Students as the primary stakeholders of their own education should understand that economic, intellectual, or material support can only go so far without their own effort, drive to learn and strategic independent learning. In doing so, they can participate in programs designed to train them in such skills. They can also use tools they have at hand to help them formulate strategies on how to maintain their motivation levels and learn.

Parents can help by providing the necessary materials as well as intellectual and emotional support their children require to maintain a healthy development. They can also collaborate with schools and teachers in cultivating the relevant skills.

6.4. Limitations of the Study and Future Direction of Research

The study employed self-report questionnaires so some level of subjectivity is unavoidable. Future research should aim to replicate the findings using larger samples that are more diverse, and also possibly, conduct experimental studies with the same topic.

Given that the EFA for the Academic Motivation Scale found a new factor structure with mixed loadings that did not support the original theoretical dimensions, the required Self-Determination Index (SDI) formula could not be used. To address this, CFA factor scores acquired from the revised factor structure were utilised in the analyses. Even though this approach allowed for the use of empirically grounded data, it restricts direct comparison with studies that used the regular SDI scoring method.

Secondly, due to limitations in budget and other challenges encountered during data collection it was impossible to use separate samples for the EFA and CFA. To mitigate any

potential bias that may arise due to this, k-fold cross-validation was employed to make the EFA and CFA results more robust and verify the stability of the new factor structure. However, future studies are encouraged to use independent samples for EFA and CFA to further validate the factor structure and ensure greater generalizability.

In light of these limitations, future researches, where possible, should apply the original SDI scoring method if the factor structure falls in line with theoretical expectations. Additionally, further research is needed to explore the newly identified factor structure and assess the AMS within the Ethiopian context.

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APPENDIX A: ENGLISH VERSION OF THE REVISED SCALES TO BE FILLED BY STUDENTS

Part I. Instruction

Please rate the degree to which the following elements relate to your reasons for attending school by marking (✓) in the area provided.

Question:- WHY DO YOU GO TO SCHOOL?

No	"I go to school because..."	Totally Disagree	Disagree	Slightly Disagree	Undecided	Slightly Agree	Agree	Totally Agree
1	Because I think that a high-school education will help me better prepare for the career I have chosen.							
2	Honestly, I don't know; I really feel that I am wasting my time in school.							
3	In order to obtain a more prestigious job later on.							
4	Because eventually it will enable me to enter the job market in a field that I like.							
5	I once had good reasons for going to school; however, now I wonder whether I should continue.							
6	Because I want to have "the good life" later on.							
7	For the pleasure that I experience in broadening my knowledge about subjects which appeal to me.							
8	For the pleasure that I experience when I am taken by discussions with interesting teachers.							
9	I can't see why I go to school and frankly, I could care less.							
10	Because my studies allow me to continue to learn about many things that interest me.							
11	Because I believe that my high school education will improve my competence as a worker.							
12	For the "high" feeling that I experience while reading about various interesting subjects.							
13	I don't know; I can't understand what I am doing in school							

Key for the revised AMS -17

1, 3, 4, 6, 11 Extrinsic motivation – Future Career Oriented

7, 8, 10, 12 Intrinsic motivation – Interest Driven

2, 5, 9, 13 Amotivation

Part II. Instruction

Below are questions about your learning strategies. Read each item and choose your level of agreement or disagreement on each statement by marking (✓) on the following response guide.

No	Self-Evaluation	Strongly Disagree	Disagree	Agree	Strongly Agree
1	I welcome feedback on my work.				
2	I ask feedback of my performance from someone whom I think is good on it.				
3	I listen attentively to people who comment on my work.				
4	I am open to feedbacks to improve my work.				
5	I seek others' opinion on the things I need to change in my work when in doubt.				
6	I improve my work by considering feedbacks I received				
	GOAL SETTING & TRACKING PROGRESS	Strongly Disagree	Disagree	Agree	Strongly Agree
1	I make sure that I accomplish the things I need to do each day.				
2	I make a schedule of the activities I need to complete				
3	I plan the things I have to do in a week.				

4	I keep track of myself if I am accomplishing my goals.				
5	I have in mind an end goal in every task that I engage in				
6	I keep track of my accomplishments.				
7	I am aware of my progress when doing certain activities.				
No	ENVIRONMENTAL STRUCTURING	Strongly Disagree	Disagree	Agree	Strongly Agree
1	I avoid any distractions while doing school work.				
2	I find a place where I can study well.				
3	I focus myself in order to study.				
4	I use a variety of sources when doing school related task.				
No	LEARNING RESPONSIBILITY & ORGANIZING	Strongly Disagree	Disagree	Agree	Strongly Agree
1	I finish all my homework first before unnecessary doing things.				
2	I make time for my schoolwork during holiday/weekends.				
3	I keep my past notes.				
4	I study whenever I can.				
No	MEMORY STRATEGY- ACTIVE PRACTICE & RECORDING	Strongly Disagree	Disagree	Agree	Strongly Agree
1	I construct questions based on what I have learned and attempt to answer them				
2	I record the lessons that I attend to.				
3	I make sample questions from a topic and answer				

	them.				
	SEEKING ASSISTANCE	Strongly Disagree	Disagree	Agree	Strongly Agree
1	I enjoy group work because of the cooperation				
2	I ask the help of a friend to review my lessons.				
3	I compare my notes with that of my classmates.				
	STRUCTURING INFORMATION & RESOURCE USE	Strongly Disagree	Disagree	Agree	Strongly Agree
1	I summarize what I have read.				
2	I outline the topics that I need to study				
3	I summarize the topics that we take up in class				
4	I use library resources to find the information that I need.				

PART III

Back ground information

Please read the following questions carefully and answer in the area provided or put a mark (✓) in the brackets.

1. Name: _____

2. Gender: male () Female ()

3. Age: _____

4. Name of school: _____

5. Grade: _____

6. Parents' educational level:

Father's Educational level : Degree and above () Diploma ()

High school () Elementary () No Education ()

Mother's Educational level : Degree and above () Diploma ()

High school () Elementary () No Education ()

APPENDIX B: AMHARIC VERSION OF THE REVISED SCALES

በተማሪዎች የሚሞላ መጠይቅ

ክፍል 1 . መመሪያ

ይህ ለምን ትምህርት ቤት እንደምትህዱ ለማወቅ የሚረዳ መጠይቅ ነው። እባኩን ከዚህ በታች እያንዳንዱን አረፍተ ነገር በጥንቃቄ አንብበው የትኛው ምርጫ ከርሶ ፀባይ ጋር እንደሚዛመድ ከዚህ በታች ባለው ሳጥን ውስጥ “✓” በማስቀመጥ ያሳውቁ። ።

ትክክለኛ ወይም የተሳሳተ መልስ የለም። ስለዚህ እባኩን በእውነተኛ እምነትዎ ምላሽ መስጠት ይገባዎታል፤ ማለትም በተገለጹት ሁኔታዎች ውስጥ ምን እንደሚደርጉ ወይም ፀባዮትን።

ጥያቄ - ለምንድን ነው ትምህርት ቤት የምትሄዱት?

ቁጥር	ትምህርት ቤት የምሄድው...	ፈጽሞ አልሰማማም	አልሰማማም	በተወሰነ ደረጃ አልሰማማም	አልወሰነኝም	በተወሰነ ደረጃ እስማማለሁ	እስማማለሁ	በጣም እስማማለሁ
1	የሁለተኛ ደረጃ ትምህርት ወደ ፊት ለምመርጠው የስራ ዘርፍ የበለጠ እንድዘጋጅ ይረዳኛል ብዬ ስለማስብ።							
2	እውነቱን ለመናገር፣ እኔ አላውቅም በትምህርት ቤት ውስጥ ጊዜዬን በማባከን ላይ እንደሆንኩ ይሰማኛል።							
3	በኋላ ላይ የበለጠ ክብር ያለው ሥራ ለማግኘት							
4	በኋላ በምወደው መስክ ውስጥ ያለው የሥራ ገበያ ውስጥ እንድገባ ስለሚያስችለኝ።							
5	በፊት ወደ ትምህርት ቤት ለመሄድ ጥሩ ምክንያቶች ነበሩኝ፤ አሁን ግን ልቀጥል አልቀጥል እያልኩ አስባለሁ።							
6	በኋላ ጥሩ ህይወት መኖር ስለምፈልግ።							
7	የሚመስጡኝ ርዕሰ ጉዳዮች/ትምህርቶች ላይ ያለኝን እውቀት በማስፋት ደስታ ስለማግኘ።							
8	የሚመስጥ ውይይት ከአስተማሪዎቼ ጋር በሚኖር ጊዜ ደስታ ስለማግኘ፡							
9	ለምን ትምህርት ቤት እንደምሄድ አይታየኝም እና እውነቱ ለመናገር ብዙም ግድ የለኝም።							
10	ትምህርቴ ብዙ ስለሚመስጡኝ ነገሮች መማሪያ እንድቀጥል ስለሚረዳኝ።							
11	የሁለተኛ ደረጃ ትምህርቴ የሰራተኝነት ብቃቴን እንደሚያሻሽል ስለማምን።							
12	ስለ ተለያዩ አስደሳች ጉዳዮች ሳኑብ ሊጋጠመኝ "ከፍተኛ" ወይም የሚያስደስት ስሜት።							
13	አላውቅም። በትምህርት ቤት ውስጥ የማደርገው ነገር ሊገባኝ አልቻለም።							

ክፍል 2. መመሪያ

ከዚህ በታች ስለ መመር ስልቶች ጥያቄዎች አሉ። እያንዳንዱን ጥያቄ እያነበባችሁ የናንተን ስምምነት ወይም አለመስማማት በሚከተለው ምላሽ መመሪያ መሰረት ምልክት አስቀምጡ።

ቁጥር	ራስን መገምገም	በጣም አልሰማማም	አልሰማማም	እስማማለሁ	በጣም እስማማለሁ
1	በትምህርቴ ላይ ስለ ሥራዬ አስተያየት በደስታ እቀበላለሁ።				
2	ስለትምህት ነክ ስራዬ ጎበዝ ከሆነ ሰው አስያየት እቀበላለሁ				
3	ስለትምህርቴ አስተያየት የሚሰጡኝን ሰዎች በጥሞና አዳምጣለሁ።				
4	ትምህርቴን ለማሻሻል ለአስተያየቶች ክፍት ነኝ።				
5	የምሰራው ስራ ላይ መቀየር ስላለብኝ ነገር ጥርጣሬ ዉስጥ ስገባ ከሌሎች አስቴያየት እጠይቃለሁ				
6	በደረሱኝ አስተያየት መሰረት ስራዬን አሻሽላለሁ				
ቁጥር	ግብ ማቀድ እና ሂደትን መከታተል	በጣም አልሰማማም	አልሰማማም	እስማማለሁ	በጣም እስማማለሁ
1	በየቀኑ ማድረግ ያለብኝን ነገሮች አሳካለሁ።				
2	ማድረግ ለሚያስፈልጉኝን ተግባራት መርሃ ግብር አዘጋጃለሁ				
3	በሳምንት ውስጥ ማድረግ ያለብኝን ነገሮች አቅጃለሁ				
4	ግቦቼን እያሳካሁ እንደሆነ እራሴን እከታተላለሁ።				
5	በምሥራብት እያንዳንዱ ተግባር ውስጥ የመጨረሻ ግቤን አስባለሁ።				
6	ስኬቶቼን እከታተላለሁ።				
7	በምሥራብት ስራ ላይ እድገት ማሳየቴን እገነዘባለሁ።				
ቁጥር	አካባቢን ማዋቀር	በጣም አልሰማማም	አልሰማማም	እስማማለሁ	በጣም እስማማለሁ
1	የት/ቤት ስራ በምሰራበት ወቅት ማናቸውንም ትኩረት የሚከፋፍሉ ነገሮችን አስወግዳለሁ።				
2	በደንብ የማጠናበት ቦታ እፈልጋለሁ።				
3	ጥናቴ ላይ ራሴን አተኩራለሁ።				
4	ከትምህርት ቤት ጋር የተያያዘ ተግባር በምሰራበት ጊዜ የተለያዩ ምንጮችን እጠቀማለሁ።				
ቁጥር	የመመር ሃላፊነት እና አዘገጃጀት	በጣም አልሰማማም	አልሰማማም	እስማማለሁ	በጣም እስማማለሁ

1	አስቸኳይ ያልሆኑ ነገሮችን ከማድረግ በፊት ሁሉንም የቤት ስራዬን እጨርሳለሁ።				
2	በእረፍት ጊዜዬ ለትምህርት ቤት ስራዬ ጊዜ እሰጣለሁ።				
3	የበፊት/ያለፉ ጽሁፎቼን በደንብ አስቀምጣለሁ				
4	በምትለው ጊዜ ሁሉ አጠናለሁ.				
ቁጥር	የማስታወስ ስልቶች	በጣም እልስማማም	እልስማማም	እስማማለሁ	በጣም እስማማለሁ
1	የተማርኩትን ተመስርቼ እራሴ ጥያቄ እያወጣሁ በራሴ እመልሳለሁ				
2	የምማርባቸውን ትምህርቶች ምስል ወይም ድምጽ እቀዳለሁ።				
3	ማጥናት ካለብኝ አርዕሶች ናሙና ጥያቄዎችን አዘጋጅቼ እመልሳለሁኝ።				
	እርዳታ መፈለግ	በጣም እልስማማም	እልስማማም	እስማማለሁ	በጣም እስማማለሁ
1	በትብብር ስላለው የቡድን ትምህርት ነክ ስራ ያስደስተኛል				
2	ትምህርቴን ከጓደኞቼ ጋር እከልሳለሁ				
3	የጻፍኳቸውን ማስታወሻዎቼን ከክፍል ጓደኞቼ ጋር አወዳድራለሁ				
ቁጥር	መረጃ ማቀናጀት እና የግብአቶች አጠቃቀም	በጣም እልስማማም	እልስማማም	እስማማለሁ	በጣም እስማማለሁ
1	ያነበብኩትን ጠቅለል አድርጌ አሳጥሬ እጽፋለሁ				
2	ማጥናት ያለብኝን እርዕሶች ዘርዘሬ እይዛለሁ				
3	በክፍል ውስጥ የምንወስዳቸውን ርዕሶች ንጥረ ነገር ጠቅለል አድርጌ አስቀምጣለሁ				
4	ለትምህርቴ የሚያስፈልገኝን መረጃ ለማግኘት የቤተ መፃህፍት መርጃዎችን እጠቀማለሁ።				

ክፍል 3

የግል መረጃ

እባክዎ የሚከተሉትን ጥያቄዎች በጥንቃቄ ያንብቡ እና በተጠቀሰው ቦታ ይመልሱ ወይም ይህን ምልክት (✓) በቅንፎች ውስጥ ያስቀምጡ።

1. ስም : _____

2. የታ: ወንድ () ሴት ()

3. እድሜ: _____

4. የትምህርት ቤት ስም : _____

5. ክፍል: _____

6. የወላጆች የትምህርት ደረጃ:

የአባት የትምህርት ደረጃ: ዲግሪ እና ከዛ በላይ () ዲፕሎማ () ሁለተኛ ደረጃ ትምህርት ()

የመጀመሪያ ደረጃ ትምህርት () ምንም ትምህርት የላቸውም ()

የእናት የትምህርት ደረጃ: ዲግሪ እና ከዛ በላይ () ዲፕሎማ () ሁለተኛ ደረጃ ትምህርት ()

የመጀመሪያ ደረጃ ትምህርት () ምንም ትምህርት የላቸውም ()

APPENDIX C: INTERVIEW QUESTIONS

Interview questions

For students

- 1) What is it exactly that motivates and drives you to perform well in your academics?
- 2) How do you deal with boredom or difficult topics in your studies? Do you face it head on and try to overcome challenges, or so you get easily discouraged? What do you do to stay motivated?
- 3) Do you set goals? How ?
- 4) What study or learning strategies do you use?
- 5) How do you track or assess your progress while studying for a particular class or assignment and what tools do you use?
- 6) How is your time management and how do you balance things when faced with different assignments or subjects at the same time?
- 7) How did you overcome a tough time or a set back you might have faced during your studies ?
- 8) Do you reflect on your performance after finishing an assignment or exam and how ?
- 9) Does feedback from you teachers and friends help you and how do you use it?
- 10) What organizational strategies and tools do you use?
- 11) What are your views regarding the failure of students on national examination? What are the perceived causes and consequences of this academic failure?
- 12) How do you view the role of students' motivation and self-regulated learning in academic performance?

For teachers

- 1) What are your views of regarding the failure of students on national examination?
- 2) What are the perceived causes and consequences of this academic failure?
- 3) How do you view the role of students' motivation and self-regulated learning in academic performance?
- 4) Do you find that your students have sustained motivation and follow their studies in a self-regulated manner ?
- 5) What can be done to improve student motivation and self regulated learning?

APPENDIX D: PATTERN MATRIX FOR THE AMS IN THE ORIGINAL EFA

Table D1: *Pattern matrix for AMS in the original EFA*

	Factor					
	1	2	3	4	5	6
Em22Reg4	.887					-.474
Em8Reg2	.676					
Em10Iden2	.626					
Em1Reg1	.600					
Em15Reg3	.550					
Em24Iden4	.534					
Em3Iden1	.422					
Em17Iden3						
Im23Know4		.751				
Im16Know3		.599				
Im25Stim4		.581				
Im18Stim3		.561				
Im27Acc4						
Am19o3			-.802			
Am26o4			-.745			
Am5o1			-.626			
Am12o2			-.601			
Em21Introj3				.585		
Em28Introj4				.442		
Im20Acc3				.413		
Em7Introj1						
Em14Introj2						
Im4Stim1					.783	
Im11Stim2					.619	
Im9Know2						.611
Im13Acc2						.483
Im2Know1						
Im6Acc1						

APPENDIX E: PATTERN MATRIX FOR THE A-SRL-S IN THE ORIGINAL EFA
Table E1: *Pattern matrix for A-SRL-S in the original EFA*

	Factor												
	1	2	3	4	5	6	7	8	9	10	11	12	13
SE8	.899												
SE9	.714												
SE2	.629												
SE12	.596												
SE7	.526												
SE11	.462												
SE1	.408												
GS2		.806											
GS1		.754											
SE5		.696											
GS4		.652											
GS3		.552											
GS5		.460											
SE6		.458											
ES1			.705										
ES3			.601										
SA1			.493										
ES2			.475										
LR4				.641									
ES4				.620									
O4				.607									
LR5				.520									
LR2				.487									
O3				.478									
MS12					.670								
MS10					.580								
MS11					.420								
SA4						.684							
SA7						.669							
SA6						.523							
MS7							.656						
MS6							.649						
MS8							.609						
SA2							.459						
O2									.597				
SA5									.501				
LR1									.422				

APPENDIX F: MODEL FIT SUMMARY

Table F1: *Model Fit summary*

Index	AMS Measurement Model	A-SRL-S Measurement model	AMS Second Order Model	A-SRL-S Second Order Model	Mediation Model
CMIN	114.274	691.306	114.274	712.777	1448.036
DF	62	413	62	427	933
P-value	.000	.000	.000	.000	.000
CMIN/DF	1.843	1.674	1.843	1.669	1.552
RMR	.206	.042	.206	.044	.238
GFI	.950	.877	.950	.873	.831
AGFI	.926	.852	.926	.853	.813
PGFI	.647	.730	.647	.752	.749
NFI	.908	.816	.908	.810	.750
RFI	.885	.793	.885	.794	.735
IFI	.956	.917	.956	.914	.894
TLI	.944	.905	.944	.906	.886
CFI	.955	.916	.955	.913	.893
PRATIO	.795	.888	.795	.918	.942
PNFI	.722	.725	.722	.744	.707
PCFI	.759	.813	.759	.839	.842
RMSEA	.052	.046	.052	.046	.042
RMSEA LO 90	.036	.040	.036	.040	.038
RMSEA HI 90	.066	.052	.066	.052	.046
PCLOSE	.409	.851	.409	.865	1.000
ECVI	.545	2.713	.545	2.692	5.228
ECVI LO 90	.462	2.496	.462	2.472	4.914
ECVI HI 90	.653	2.955	.653	2.938	5.567
MECVI	.554	2.772	.554	2.742	5.338
AIC	172.274	857.306	172.274	850.777	1652.036
BCC	174.963	876.010	174.963	866.326	1686.792
BIC	281.282	1169.295	281.282	1110.141	2035.444
CAIC	310.282	1252.295	310.282	1179.141	2137.444
NCP	52.274	278.306	52.274	285.777	515.036
NCP LO 90	26.096	209.782	26.096	216.181	415.910
NCP HI 90	86.279	354.714	86.279	363.258	622.093
FMIN	.362	2.188	.362	2.256	4.582
F0	.165	.881	.165	.904	1.630
F0 LO 90	.083	.664	.083	.684	1.316
F0 HI 90	.273	1.123	.273	1.150	1.969
Hoelter (0.05)	226	211	226	212	220
Hoelter (0.01)	252	221	252	221	227

APPENDIX G: PILOT STUDY REPORT

Introduction

Maintaining a strong academic performance is necessary for future personal and professional success. There are many factors that contribute to academic performance, out of these, academic motivation and self-regulated learning have been listed as important factors. Academic motivation is defined as elements that affect the effort, perseverance and direction of students actions with regards to their academic activities (Fuertes et al.,2023). It has generally been distinguished in to extrinsic motivation, intrinsic motivation and amotivation. Self-regulated learning, on the other hand has been defined as how students pro-actively manage and evaluate their learning process with the use of self-regulated learning strategies (Zimmerman, 2010). Research has noted that there is some decline in motivation and performance in adolescents as students transition from elementary school to high school. This indicates that the effort that students direct towards their academics during this period is lower. Despite this fact, independent learning becomes crucial as students grow and develop since the time and support from teachers gradually decreases. This makes academic motivation and self-regulated learning essential to the academic process and therefore understanding them is necessary to the attainment of academic success.

Purpose of the Pilot Study

The purpose of this pilot study is to test the research design, methods , and determine the content validity and reliability of the data collection and gathering tools so as to evaluate the feasibility of the study. The following are the research questions that the main study answers and guide this pilot study:

- I. What are the levels of Academic motivation, self-regulated learning and academic performance among the students?

- II. What is the nature of the relationship (i.e., direction, magnitude and statistical significance) among academic motivation, self-regulated learning and academic performance?
- III. What proportion of variance in academic performance do academic motivation and self-regulated learning explain jointly and independently?
- IV. Does self-regulated learning mediate the relationship between academic motivation and academic performance?
- V. Are there statistically significant differences in academic motivation, self-regulated learning, and academic performance with respect to demographic variables (i.e., age, gender, school type, parental education level, family structure)?
- VI. What are the school community's perspectives on how students' motivation and self-regulated learning relate to academic performance?

Characteristics of the Pilot Study Participants

Sample Size and Sampling Techniques

Stratified random sampling was used to select the students. The data was stratified based on class level, school type, gender and average grades then proportional allocation was used to select the participants. The sample included 45 adolescents aged 14 to 18, from the private school and government school. There were 28 females and 17 males. 10 students were selected from the private school and 35 students from the government school this was based on their proportion within the population. The respective frequencies are shown in the table G1 below.

Table G1: *Characteristics of the participants*

Characteristics	Category	Frequency	Percentage
Gender	Male	17	37.8
	Female	28	62.2
	Total	45	100
Age	15	1	2.2
	16	13	28.9
	17	15	33.3
	18	16	35.6
	Total	45	100
Grade level	10	19	42.2
	11	13	28.9
	12	13	28.9
	Total	45	100
School Type	Government	35	77.8
	Private	10	22.2
	Total	45	100
Parental Education	Degree and above	13	28.9
	Diploma	3	6.7
	High school	22	48.9
	Elementary	4	8.9
	No education	3	6.7
	Total	45	100

Methods

This part presents the design and approaches, the data collection, and data gathering tools.

Research Approach and Design

Explanatory sequential mixed method research will be used for the main study, but this pilot study is limited to assessing the reliability of the instruments and feasibility of the procedures. Explanatory sequential mixed method research has two phases. The first is the quantitative part which analyses and reports the data quantitatively which helps in measuring

data and identifying patterns. This is then followed up by the qualitative part of the study which aims to further explore or explain the results from the quantitative part hoping to provide a deeper insight how and why certain patterns exist (for instance , if the quantitative data finds that the students are highly self-regulated learning , the qualitative part will most likely delve in to how this has helped the students , what self regulated leaning strategies they use and what other personal factors influence regulation.

Data Collection

After permission was sought from the concerned parties with regards to conducting the pilot study, the researcher collected the performance data of the students from the schools. This data was categorised based on performance in to high, average and low. This was done in order to establish the proportions of each for the sampling. On the day of the data collection, the purpose of the study and instructions were thoroughly explained to the participants by the researcher and assistant. They were also assured of the confidentiality and anonymity of their responses. The questionnaires were administered at the agreed up on time with the school. The researcher also recorded the time it took the students to complete the questionnaires. It took them approximately 30 to 40 minutes. Over all, the data collection went smoothly.

Data Gathering Tools

The first tool used to measure academic motivation was The Academic Motivation Scale (Vallerand et al ., 1992). This is a 28 item scale that measures the different types of academic motivation classifying them in to different subscales. Each subscale of intrinsic motivation, extrinsic motivation and amotivation have four corresponding items. Intrinsic motivation is measured by three subscales: intrinsic motivation to know, intrinsic motivation toward accomplishment, and intrinsic motivation to experience stimulation. Extrinsic motivation also has three subscales: extrinsic motivation identified, extrinsic motivation introjected and

extrinsic motivation external regulation. Amotivation stands alone as one subscale with four items.

Each item has a 7-point scale and originally the scaling was: 1= Does not correspond at all , 2 and 3= Corresponds a little, 4 = corresponds moderately , 5 and 6 = Corresponds a lot , 7= Corresponds exactly. The internal consistency of the scale is reported as being between 0.83 and 0.86 (Vellerand et al., 1992). Mutweleli (2014) also did a reliability analysis within the context of a developing country , Kenya , to be more specific and found a reliability of 0.80 for the overall Academic Motivation Scale. There was need to check the internal consistency of the tools within the context of Ethiopia and so this pilot study was used for that purpose finding an overall reliability of 0.86. The relevant reliabilities for each of the subscales can be seen in table G2

Table G2: *Chronbach Alpha's for Academic Motivation Scale*

No	Sub-scale	Number of Items	Cronbach's Alpha
1	Intrinsic motivation – to know	4	0.73
2	Intrinsic motivation-toward acc	4	0.71
3	Intrinsic motivation to exp.Stim	4	0.65
4	Ext M.Iden	4	0.72
5	Ext M.Introj	4	0.68
6	Ext M. Reg	4	0.77
7	Amotivation	4	0.74
	Over all AMS	28	0.86

The second tool used was the Academic Self-Regulated Learning Scale (A-SRL-S) developed by Magno (2010) to measure self-regulated learning. The scale has 54 items that are classified in to seven self-regulated learning strategies, namely; memory strategy, goal setting, self-evaluation, seeking assistance, environmental structuring, learning responsibility, planning and organizing. The scale is reported to have strong validity and its internal consistency is reported to be between 0.73 and 0.87 (Magno, 2011). The internal consistency for this scale was also assessed in this pilot study using cronbach's alpha which yielded 0.92 for the over all scale. The respective reliabilities for the subscales are below in table G3

Table G3: *Cronbach's Alpha for the Academic Self-Regulated Learning Scale*

No	Sub-Scale	Number of items	Cronbach's Alpha
1	Memory Strategy	14	0.77
2	Goal Setting	5	0.70
3	Self -Evaluation	12	0.82
4	Assistance Seeking	8	0.66
5	Environmental Structuring	5	0.69
6	Learning Responsibility	5	0.54
7	Organising	5	0.72
	Over all	54	0.92

Academic performance was measured by their average semester grades by the end of the semester along with the Academic Performance Scale , a 5 item scale developed by the researcher. The internal consistency of this scale was also assessed using Cronbach's Alpha ,

which yielded a value of 0.68. One item displayed a low corrected item- total correlation of 0.25. Additionally, the Cronbach's alpha if item was deleted was found to be 0.71 which would reasonably increase the reliability of the scale , so based on these findings the item will either be revised or if deemed essential, won't be considered in the final analysis. For the qualitative part the 15 item semi structured interview questions developed by the researcher were used.

Two experts were asked to rate the items of these scales to assess the content validity of the scales across 5 criteria: relevance, clarity, language , cultural applicability and comprehensiveness. I-CVI ,S-CVI/Ave , and S-CVI/UA values were computed across these domains. On the AMS, 19 items had total agreement across all the criteria from the experts with only 9 items having I-CVI values of 0.5 across some criteria. The S-CVI/UA for all the rated criteria on the AMS was > 0.78 , while on the second scale 48 items had total agreements on all criteria with only 6 items having I-CVI values of 0.5 across some domains. S-CVI/UA across all the domains that were rated for this scale was > 0.90 . The first scale also had S-CVI/Ave value > 0.89 across all domains, while the second had S-CVI/Ave values > 0.95 .

For the self-report grades section, both spearman correlation and Wilcoxon test were done to check if there is any consistency between the actual grades and students self-report grades. The correlation revealed a positive correlation of 0.549 with a p-value of <0.001 . On the other hand, the Wilcoxon test showed significant differences between the two with a p-value of 0.01, with some students underreporting and others over reported their grades while only 3 reported their actual grades. As the correlation was below 0.8 despite the fact that it was a positive correlation and the Wilcoxon test showing significant differences, it indicates some level of inconsistency.

Translation was done by the researcher and a professional translator. The scales were first translated from English to Amharic then back to English again from the Amharic. It was also further checked by a linguistics instructor at AAU.

Improvements

Based on the results of the reliability analysis and after considering expert evaluations in this pilot study, the item total correlations were assessed for items with lower cronbach's alphas and these items were revised, adjusted or deleted as deemed necessary for the main study. In the Academic Motivation Scale, items 1 and 7 were both revised and adjusted due to low total item correlations because it was found that the if item deleted values of both these items would affect the overall reliability if they were removed. Like wise, in the Self Regulated Learning Scale, items 1,3,4, and 8 in Seeking Assistance , item4 in Environmental Structuring and items 1, 2 and 5 in Learning Responsibility were revised and adjusted up on reviewing their item total correlations as shown in the table G4 below.

Table G4: *Adjusted items*

No	AMS	AMS
1	Because I need at least an ESSLCE certificate or a degree in order to find a high-paying job later on.	Because I need to at least complete high school in order to find a high paying job later on.
7	To prove to myself that I am capable of completing my secondary school course.	To prove to myself that I can finish my high school course
	A-SRL-S	A-SRL-S
	Seeking Assistance	Seeking Assistance
1	I use a variety of sources when doing school related task.	I refer to different sources when doing my academic tasks

3	I make my own notes in class	I take my own notes during class
4	I enjoy group work because of the cooperation	I like group work because it involves collaboration and teamwork
8	I share to my peers what I have learned.	I share what I've learned with my peers
Environmental Structuring		Environmental Structuring
4	I am not easily distracted by the things around me when I study	I am not easily distracted by my surroundings while I study
Learning Responsibility		Learning Responsibility
1	I recheck my homework if it is done properly before submitting.	I review my homework to ensure it's done correctly before submitting it
3	I make sure I submit good work on time.	I ensure that I submit quality work on time
5	I continue studying on a topic even if it is not required	I keep studying a topic even when it's not required

For the Academic Performance scale, Item 5 was found to have low total item correlation and its if item deleted values raised the chronbach's alpha of the scale to 0.71 so the item was removed or not considered in the analysis. Based on the Wilcoxon test and spearman correlation, the self-reported grades of the students were also changed to include only their most recent semester average grades as it was thought the inconsistency could have arisen from the student's forgetfulness. Family structure is also included in the background information for the main study. Parental education was also divided in to father's education and mother's education. The scale point ratings in the translated Amharic versions were also adjusted to better reflect the terms depicted in the English version.

Generally, based on feedback and other considerations some other improvements on the scale were made. The point scale ratings were changed to 1= Totally Disagree , 2=

Disagree, 3 = Slightly Disagree, 4 = Undecided , 5=Slightly Agree , 6= Agree, 7 = Totally Agree for the AMS. Based on participant comments these were also displayed on both pages.

The Relation of the Pilot and Main Study Site and Participants

One of the similarities between the pilot study and the main study is the locations of the particular schools. Both private schools in each study are located in the Bole area and both government schools in each study are located in the Kirkos area. In terms of school status the status of both private schools were similar and the same with the government schools. The private schools were also alike in terms of quality of teaching which also applies in the case of the government schools. In addition to this, the background of the students in terms of parental education is deemed to be somewhat similar within the corresponding school types, in that the parental education of the students in the two private schools is deemed to be higher than that of the government schools. The age of the participants is also similar in that they are all adolescents aged 14 to18 and both males and females were considered.

Implications of the Pilot Study for the Main Study

This pilot study functions as the initial inquiry that assists in refining the design, methods, tools and procedures to be used before beginning the full scale study. It serves to pinpoint any weaknesses in the instruments by assessing the validity and reliability of the tools to make them ready for the main study. It lets the researcher know if the planned procedures are feasible in order to address them before the main study. It also reveals how long the data collection process could take so that resources can be better allocated for the main study. Any issues with tools will be addressed for the main study and it is hoped that increments in the sample size will also improve the normality of the distribution.

Over all, 2 items from the AMS and 8 items from A-SRL-S were improved which can be found in the “improvements” section. The number of items to retain for the main study will

be determined based on EFA and CFA results to be conducted in the main study as due to sample size and budget constraints it was impossible to conduct them in the pilot study.

APPENDIX H: ASSUMPTION TEST RESULTS

Results of the Assumption Tests

Before performing further statistical analyses, the main assumptions of the statistical tests were assessed. Assumption of normality was assessed through Shapiro Wilk's test and additional inspection of the skewness and kurtosis of the data were made along with visual inspections. The Shapiro Wilk's was significant for all three variables while inspection of the histograms suggested a slight deviation from normality, this was further confirmed by the skewness and kurtosis which revealed slight skewness and kurtosis that is well within the accepted threshold of ± 1 (George & Mallery, 2010). Considering the large sample size ($n=317$) and use of robust methods parametric tests were deemed applicable.

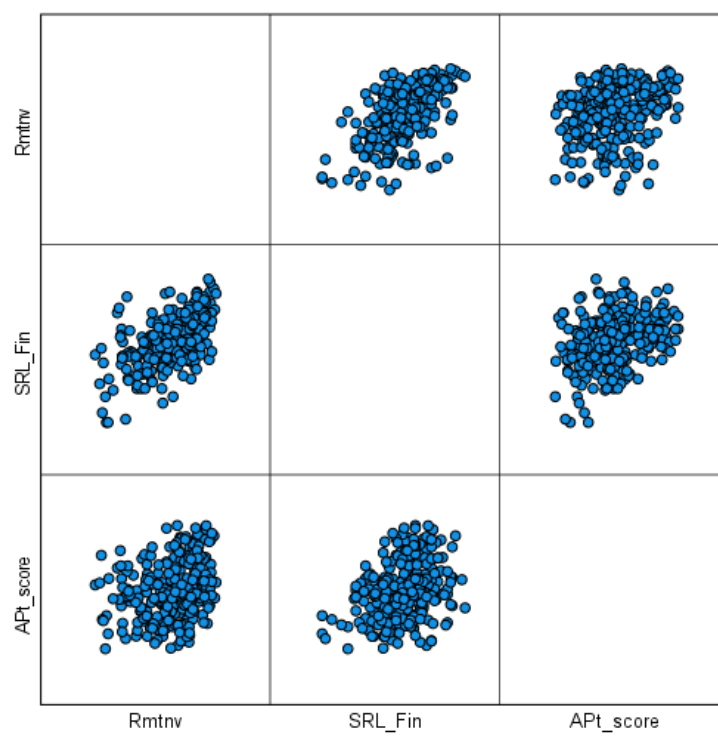
Linearity was also tested also tested through inspecting the scatterplots of the respective variables as shown below in figure H1. The visual inspection affirmed that assumption of linearity was met. Multicollinearity was also assessed through VIF and tolerance values which were 0.676 and 1.480 suggesting that there was no issue of multicollinearity. The assumption of independence of observation was maintained as the response of the respondents was independent of one another. Likewise, the residuals were also confirmed to be independent through the Durbin-Watson test which yielded a value of 1.994 which is very close to 2.0.

Table H1: Results of the statistical assumption tests

	Shaphiro.W	Skewness	Kurtosis	VIF	Tolerance	Durbin Watson
AM	.938 ($p < 0.001$)	-0.852	0.154	.676	1.480	
SRL	.985 ($p = 0.002$)	-0.458	0.699	.676	1.480	
AP	.982 ($p < 0.001$)	0.258	-0.301			1.994

Note : AM = Academic Motivation; SRL = Self-Regulated Learning; AP = Academic Performance.

Figure 3: *Linearity Test*



APPENDIX I: FULL DESCRIPTIVE STATISTICS

Table I1: *Full Descriptive statistics*

		Statistic	Std. Error
Academic	Mean	1.95	.036
Motivation	Median	2.10	
	Std. Deviation	.65	
	Minimum	.00	
	Maximum	3.01	
	Range	3.01	
	Interquartile Range	.86	
	Skewness	-.852	.137
	Kurtosis	.154	.273
SRL	Mean	82.39	0.84
	Median	83.00	
	Std. Deviation	15.01	
	Minimum	31.00	
	Maximum	120.00	
	Range	89.00	
	Interquartile Range	19.00	
	Skewness	-0.458	0.137
	Kurtosis	0.699	0.273
Academic Performance	Mean	66.63	0.77
	Median	65.57	
	Std. Deviation	13.78	
	Minimum	36.30	
	Maximum	99.60	
	Range	63.30	
	Interquartile Range	15.90	
	Skewness	0.258	0.137
	Kurtosis	-0.301	0.273

APPENDIX J: FACTOR ANALYSIS RESULTS

Exploratory Factor Analysis Results

In order to assess the underlying factor structure of the AMS and ASRL-S, exploratory factor analysis (EFA) was carried out. The original academic motivation scale has 28 items and 7 subscales which include: Intrinsic motivation to know, Intrinsic motivation towards accomplishments, intrinsic motivation to experience stimulation, extrinsic motivation - identified, extrinsic motivation -introjected, extrinsic motivation –external regulation and amotivation. The original self-regulated learning scale also had 7 subscales but 54 items as mentioned before and these include: memory strategies, goal setting , self-evaluation, assistance seeking, environmental structuring, learning responsibility, and planning and organizing.

In the EFA, extraction method was done through Principal Axis Factoring for both scales as it is better suited to handle slight non-normality. The scree plot and Eigenvalues greater than 1 were utilised to determine the number of factors. Promax rotation with Kaiser Normalization was used as the rotation method as the factors were expected to have some correlation. All items with loadings $\geq .40$ were retained and suitability of the data for factor analysis was assessed. The Kaiser-Meyer-Olkin (KMO) was 0.91 for both scales which according to Kaiser (1974) exceeds the recommended minimum value of 0.50 and is therefore considered excellent. Bartlett's Test of Sphericity was also statistically significant, $\chi^2(df=378) = 3294.142$, $p < .001$ and $\chi^2(df=1431) = 7371.173$, $p < .001$ for the AMS and ASRL-S respectively, which indicated that the data was suitable for a factor analysis.

Initially, 6 factors were revealed through the total variance explained table with eigenvalues > 1 as seen in table J1. Cumulatively, the five factors explained 57.62% of the variance.

Table J1: *Total variance explained for the AMS*

Factor	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	8.667	30.954	30.954
2	2.152	7.686	38.640
3	1.801	6.432	45.072
4	1.345	4.802	49.875
5	1.137	4.060	53.934
6	1.034	3.693	57.627

Further inspection of the pattern matrix as shown in appendix 8 revealed that two of the items loaded in the fifth factor on their own which wouldn't be suitable for CFA so it could not be considered. One extrinsic motivation – external regulation item, item 22 from the original scale cross loaded on both factor 1 and factor 6 so it was removed. The two items retained in factor 6 were not suitable for the CFA so they were likewise not considered. The remaining 4 factors explained 49.87% of the variance. There was some amount of mixed loadings in factor 4 with extrinsic motivation- introjected items loading with intrinsic motivation towards accomplishment items. Factor 1 had six items made up of extrinsic motivation types with three extrinsic motivation-external regulation items and three extrinsic motivation- identified items. Factor 2 had four items made up of intrinsic motivation items with two intrinsic motivation to know and two intrinsic motivation to experience stimulation items loading together. The third factor is composed of all the four amotivation items while the fourth factor had mixed loaded items which contained intrinsic and extrinsic motivation types. In total, the number of items that were suitable for CFA in all the factors amounted to 17 items. As shown in the pattern matrix in appendix 8, the seven subscales of the original scale were also not grouped distinctly in separate factors as in the original, with the

retained extrinsic motivation types loading together which also applies to intrinsic motivation types and the factor with the mix loadings.

For the A-SRL-S, in the original EFA, 13 factors had eigenvalues >1 which explained 62.26% of the variance as shown in table J2.

Table J2: *Total Variance Explained for the A-SRL-S*

Factor	Total	Initial Eigenvalues	
		% of Variance	Cumulative %
1	14.478	26.812	26.812
2	2.408	4.460	31.272
3	2.263	4.192	35.463
4	2.174	4.026	39.489
5	1.825	3.379	42.868
6	1.655	3.064	45.932
7	1.612	2.985	48.917
8	1.430	2.649	51.566
9	1.365	2.527	54.093
10	1.198	2.218	56.311
11	1.178	2.182	58.493
12	1.035	1.917	60.410
13	1.003	1.858	62.268

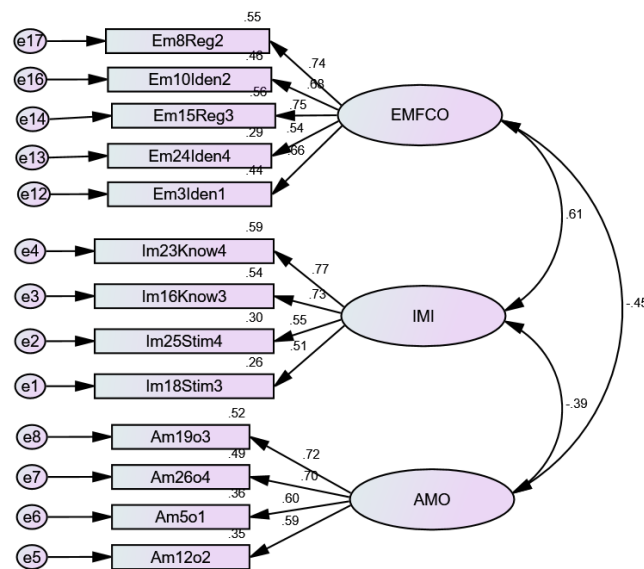
After examining the pattern matrix of the original EFA for the A-SRL-S it was discovered that factors 8, 10, 11, 12, and 13 had less than three items which is not suitable for CFA so they were dropped and also left out of the table in appendix E to save space; after which a cleaner 8 factor structure emerged with 37 items though initially the EFA showed 43 items. Factor 1 was composed of 7 self-evaluation items, factor 2 included 5 goal setting items and 2 self-evaluation items, factor 3 was made up of 3 environmental structuring items and one seeking assistance item, factor 4 had 3 learning responsibility items, 2 organizing and planning items and 1 environmental structuring items, factors 5 and 6 had 3 items each from memory strategies and seeking assistance respectively. Factor 7 was mix loaded with

memory strategy and seeking assistance items while factor 9 like wise had 3 mix loaded items including seeking assistance, organising and planning , and learning responsibility.

Confirmatory Factor Analysis Results

CFA was performed with models specified based on the suggestion of the original EFA results (N= 317) for both scales to confirm the factor structure as a requisite for the mediation analysis and to confirm construct validity. The measurement model based on the EFA of the AMS was estimated and goodness-of-fit statistics were attained.

Figure 4: Measurement Model of the Revised AMS



The model showed an acceptable fit $\chi^2(113) = 209.442$, $p < 0.001$, $\chi^2/df = 1.85$, CFI = 0.93, TLI = 0.92, RMSEA = 0.05, SRMR = 0.057. The result was somewhat improved after the removal of two lone loading items unsuitable for CFA and two items with standardized factor loading less than 0.5, $\chi^2(62) = 114.274$, $p < 0.001$, $\chi^2/df = 1.84$, CFI = 0.95, TLI = 0.94, RMSEA = 0.05, SRMR = 0.05. After the removal of the low loading items and two remaining items of factor 4 on which the CFA couldn't be performed there remained 13 items

in total. The removal of the only remaining extrinsic motivation –introjected and intrinsic motivation towards accomplishment items possibly meant that the specific subscales were not supported by the data. The standardized factor loadings of the model are displayed below in table J3.

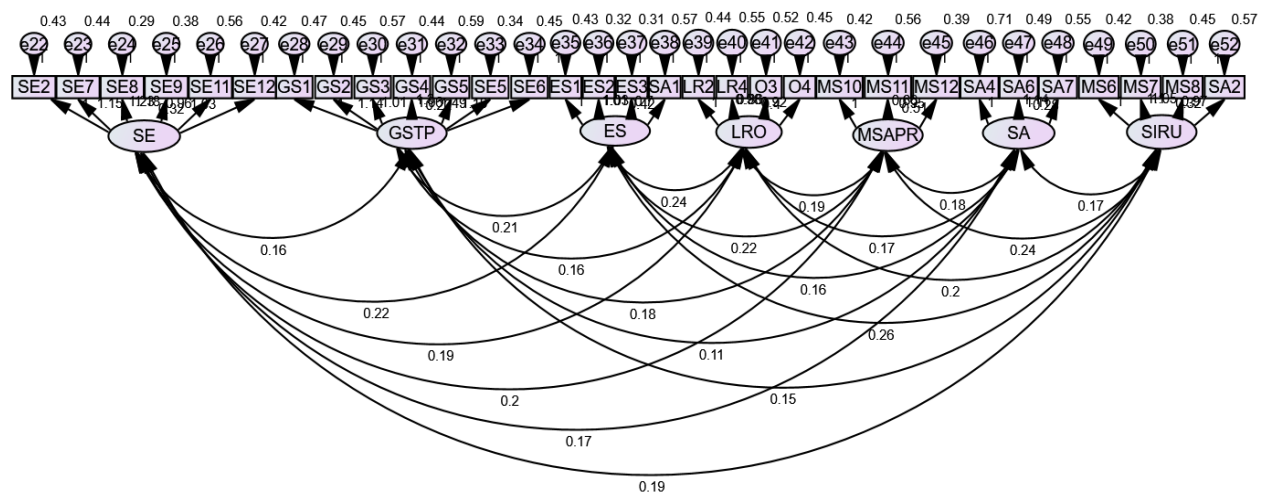
Table J3: *Standardized factor loadings for the AMS*

Item	Standardized factor loadings
Im18Stim3	.511
Im25Stim4	.552
Im16Know3	.733
Im23Know4	.767
Am12o2	.590
Am5o1	.603
Am26o4	.700
Am19o3	.724
Em3Iden1	.663
Em24Iden4	.542
Em15Reg3	.746
Em10Iden2	.677
Em8Reg2	.740

The three factors indicated by the EFA and CFA formed the new subscales and were labelled correspondingly. Factor 1 was labelled as Extrinsic Motivation – Future Career Oriented (EM-FCO), as it is composed of extrinsic motivation items that show motivation driven by external rewards of future career and status. Factor 2 included intrinsic items that show interest as the main drive of motivation so it was designated Intrinsic Motivation – Interest Driven (IM-ID). Lastly, factor 3 which is made up of 4 Amotivation items was left unchanged.

For the A-SRL-S, initially, the CFA statistics were not a particularly good fit except for the the RMSEA and SRMR which were somewhat acceptable, $\chi^2(601)=1106.607$, $p < 0.001$, $\chi^2/df = 1.84$, CFI = 0.87 ,TLI = 0.85 , RMSEA = 0.05, SRMR = 0.056. After inspecting the standardised factor loadings, low loadings below 0.5 were removed which resulted in the removal of 4 items but the removal of one item in particular, the fifth Seeking Assistance item, had a loading of 0.49 and its removal resulted in a two item factor which was impractical in CFA so the two items were also not considered in the CFA, which resulted in 31 remaining items with an improved model fit , $\chi^2(413)=691.306$, $p < 0.001$, $\chi^2/df = 1.67$, CFI = 0.91 ,TLI = 0.90 , RMSEA = 0.04, SRMR = 0.051.

Figure 5: Measurement Model of the Revised A-SRL-S



The seven new factors for the A-SRL-S were also labelled accordingly. Factor 1 was denominated as Self-Evaluation (SE), factor 2 was designated as Goal Setting & Tracking Progress (GSTP) , factor 3 was left as Environment Structuring (ES), factor 4 was termed as Learning Responsibility & Organising (LRO), factor 5 was named as Memory Strategy –

Active Practice &Recording(MS-APR), factor 6 was termed Seeking Assistance (SA) in line with the original scale and finally factor 7 was labelled as Structuring Information &Resource Use (SIRU).

Table J4: *Standardized factor loadings for the A-SRL-S*

Item	Standardized factor loadings
SE7	.697
SE8	.788
SE9	.732
SE11	.584
SE12	.664
GS1	.560
GS2	.621
GS3	.526
GS4	<u>.674</u>
GS5	.540
SE5	.762
SE6	.633
ES1	.703
ES2	.761
ES3	.762
SA1	.519
LR2	.693
LR4	.591
O3	.653
O4	.658
MS10	.743
MS11	.534
MS12	.740
SA4	.529
SA6	.651
SA7	.615
MS6	.659
MS7	.707
MS8	.662
SA2	.587
SE2	.652

After an acceptable model fit was achieved from the measurement models , a second order model was drawn and estimated for both scales. Paths were drawn from the latent variables academic motivation and self-regulated learning to their subscales or factors which have their own indicators. The model showed similar acceptable fits $\chi^2(62) = 114.274$, $p < 0.001$, $\chi^2/df = 1.84$, CFI = 0.95 , TLI = 0.94 , RMSEA = 0.05, SRMR = 0.05 for the AMS for the A-SRL-S and $\chi^2(427) = 712.777$, $p < 0.001$, $\chi^2/df = 1.66$, CFI = 0.91 , TLI = 0.90 , RMSEA = 0.04, SRMR = 0.054.

K-fold Cross Validation Results

Since due to sample size constraints it was impossible to conduct EFA and CFA on different independent samples, so after the original EFAs and CFAs (N=317) were examined, in-order to check the stability and generalizability of the factor structure, k-fold cross validation (K= 5) was implemented for both academic motivation and self-regulated learning scales. The data was divided in to 5 relatively equal subsamples. Four folds were considered as training sets for cross validation EFA subsamples, while one fold was used as the test fold for the cross validation CFA, a process which was repeated 5 times, but additional final CFA validation with the whole sample (317) was also done. Kyriazos (2018) suggested a similar cross validation process albeit with independent sample splitting.

The EFA on the four training sets were examined and compared with one another as well as with the original EFA based on similarities of number of factors and factor structure (item retention and placement. As shown above, the original EFA for the AMS had revealed a 6 factor solution initially but after removing single loaders and low loading items it was reduced to 3 factors. Based on number of factors, a slight variation was noticed in the k-fold cross validation EFAs though largely stable. A 6 factor structure was observed from four

folds initially while one fold had 5 factors but after trimming problematic items two folds retained 3 factors like the original EFA while two other folds had 4 factors. On the other hand, one fold produced a five factor structure after trimming. Fourteen to sixteen items out of the seventeen items from the original EFA were consistently present in all folds. Two folds along with the original EFA had items that load on to similar factors with similar factor placement while factor placement was somewhat switched in the 3 remaining folds, i.e. factor 1 in one fold may appear as factor 2 in another fold with a slight variation in the factor loadings.

Table J5: *K-fold Cross validation EFA and CFA results for the AMS*

Fold	Final No of Factors (After Trimming)	Items Retained (Original 17 item EFA comparison)	CFI	RMSEA	TLI	SRMR
1	4	15	0.91	0.05	0.90	0.05
2	3	15	0.95	0.04	0.94	0.05
3	5	16	0.92	0.05	0.90	0.05
4	4	15	0.90	0.05	0.89	0.05
5	3	14	0.95	0.05	0.93	0.05

Based on the factor solutions obtained from the training set EFAs, confirmatory factor analyses were performed. The summary of the fit indices of each fold are listed above in table J5. Moreover, additional CFA on the full dataset was conducted with these models as further assessment and the model fit remained fairly consistent. This consistency was also observed in the original CFA of the original EFA and all the CFA results consistently showed acceptable to good model fit ($CFI \geq 0.90$, $RMSEA < 0.06$, $SRMR = 0.05$) across all folds in spite of the observed minor differences in factor retention across folds, , suggesting a reasonably stable underlying structure.

The k fold cross validation for the A-SRL-S initially showed three folds with 13 factors consistent with the original EFA while one fold had 14 and another had 12 factors. After removing the factors that were considered unsuitable for CFA due to less than two item loadings, a 7 factor structure emerged for two folds while and eight factor solution emerged for two other factors and one fold remained with 9 factors. The model tested on fold 1 retained 28 of the items of the original EFA, the one tested on fold 2 had 32 items of the original EFA, the third fold had 25 items while folds 4 and 5 retained 33 and 20 items of the original EFA while all folds retained 40 to 46 items of the original scale without trimming factors unsuitable for CFA, but after trimming these and cross loaders the folds had 29 to 39 items. Throughout the folds, the placement of items on factor 1, 2 and 3 were at times switched between the factors. There was only a slight variation of factor loadings between the folds as well as the original EFA, for example the eighth self-evaluation item loaded between 0.8 to 0.94 across the all folds and the original EFA.

Table J6: *K-fold Cross validation EFA and CFA results for the A-SRL-S*

Fold	Final No of factors (after trimming)	Items Retained (Original 21 item EFA comparison)	CFI	RMSEA	TLI	SRMR
1	9	28	0.89	0.05	0.88	0.04
2	8	32	0.87	0.05	0.85	0.05
3	7	25	0.88	0.05	0.87	0.05
4	8	33	0.89	0.05	0.88	0.05
5	7	20	0.90	0.05	0.89	0.05

CFA was also conducted based on the factor structure produced by the training set EFAs of the A-SRL-S, the results of which are summarized in table J6. The CFA model fit indices across folds were consistent and within marginal to acceptable thresholds (CFI = 0.87– 0.90,

TLI = 0.85– 0.89, RMSEA = .05, SRMR = .04–.05). In comparison to the original, the original EFA model, tested with the original CFA, had a slightly better fit (CFI = 0.91, TLI = 0.90) as mentioned above.

There are many previous studies that performed EFA and CFA for the AMS though it was hard to find more than three such studies for the A-SRL-S all of which were mostly conducted by the owner of the scale. Varying factor structures were extracted in the EFA studies that validated AMS in various locations. Nguyen & Nguyen (2019) validated the AMS in a Vietnamese context demonstrating that the seven factor structure of the original scale fit the data well. On the contrary, Cokley (2015) expressed that all five, three, and seven factor solutions were not a good fit. Karagüven (2012) found a five factor structure with mix loading factors that combined EM-introj with IMTA and therefore did not align with the self-determination theory. Such mixed loading was also observed in the current study through the k-fold cross validation EFAs while the original EFA also additionally found that EM-iden items mix loaded with the other extrinsic items . (Ardenska, et al., 2016) also found a four factor structure in a Polish-Turkish sample with factors similar to that of (Karagüven, 2012).