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REPUBLIC OF CAMEROUN
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UNIVERSITY OF YAOUNDE I
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# SELF REGULATED LEARNING STRATEGIES OF SECONDARY SCHOOL STUDENTS AND THEIR ACADEMIC PERFORMANCE: THE CASE OF FORM FIVE AND UPPER SIXTH STUDENTS OF 2 SECONDARY SCHOOLS IN BAMENDA

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## DEDICATION

This work is dedicated to:

My Husband; Dr. Ngwabie Martin,

and my children; Ngwabie Tyler and

Ngwabie Keren

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## LIST OF ABBREVIATIONS

GCE: General Certificate of Education

GCE O level: General Certificate of Education Ordinary Level

GPA: Grade Point Average

MSLQ: Motivated Strategy for Learning Questionnaire

SRLS: Self-regulated Learning Strategy

TIMSS: Trends in International Mathematics and Science Study

SRLIS: Self-regulated Interview Schedule

P.S.S: Presbyterian Secondary School

G.H.S: Government High School

GBHS: Government Bilingual High School

Rcal: Calculated correlation coefficient

Rcrit: Critical Correlation coefficient

Ho: Null Hypothesis

Ha: Specific Hypothesis

df: Degree of Freedom

r: correlation coefficient

CLS: Cognitive Learning strategies

MCLS: Metacognitive Learning strategies

TSEMLS: Time and Study Environment Management Learning Strategy

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## LIST OF ACRONYMS

MINESEC: Ministry of Secondary Education

MANOVA: Multiple Analysis of Variance

LASSI: Learning and study Strategy Inventory

ANOVA: Analysis of Variances

## ABSTRACT

This study entitled “Self-regulated learning strategies and academic performance of secondary school students: the case of form five and upper sixth students of some secondary schools in Bamenda, North West Region, Cameroon”, examined the association between the self-regulated learning strategies that secondary school students use and their academic performance. To attain the main objective, four research hypotheses were formulated: there exist a significant relationship with the use of cognitive learning strategies and the academic performance of students; there exist a significant relationship with the use of metacognitive learning strategies and the academic performance of secondary school students; there exist a significant relationship with the use of time and environmental management learning strategies and the academic performance of secondary school students and lastly, some learning strategies have a greater significant relationship on the academic performance of secondary school students than others. Data was collected by means of a questionnaire, from a sample made up of 341 secondary school students from one public and one private secondary school and subjected to the following analysis: Analysis of Variances (ANOVA), paired wise t-test and Pearson’s correlation coefficient. The ANOVA test revealed that there was a significant difference in students’ use of the three categories of learning strategies($p < 0.05$), while the multi comparisons pair wise t. test revealed that no two categories of learning strategies were used to the same extend by the students (p-values from all pairs $< 0.05$). Indeed, the students used cognitive strategies the most, followed by metacognitive strategies The use of all categories of learning strategies indicated a significant relationship with academic performance (cognitive learning strategies obtained a p value of 0.01, metacognitive learning strategies p value 0f 0.005 and time and study environment management a p value of 0.01). The use of metacognitive learning strategies showed a more significant association with academic performance than any of the other two categories of learning strategies with a p value of 0.005 as opposed to 0.01 for each of the other two categories of learning strategies. Recommendations for teaching and counselling of students and teacher training, have been made.

## RESUME

Cette recherche intitulée, "Les Stratégies d'autorégulation d'apprentissage et de rendement scolaire des élèves des établissements secondaires : le cas de les élevés de Form Five et Uppersixth de Bamenda, Nord-ouest région, Cameroun " vise à examiner le lien entre les stratégies d'autorégulation d'apprentissage que les élèves du secondaire utilisent et leur rendement scolaire. Pour atteindre cet objectif principal , quatre hypothèses de recherche ont été formulées : il existe une relation significative entre l'utilisation de stratégies d'apprentissage cognitives et le rendement scolaire des élèves ; il existe une relation significative entre l'utilisation de stratégies d'apprentissage métacognitives et le rendement scolaire des élèves du secondaire ; il existe une relation significative entre l' utilisation de stratégies de gestion du temps, l'environnementale des d'apprentissage et le rendement scolaire des élèves du secondaire. Enfin, certaine des stratégies d'apprentissage ont une relation significative plus important sur le rendement scolaire des élèves des établissements secondaires que d'autres. Les données ont été recueillies au moyen d'un questionnaire, à partir d'un échantillon composé de 341 élèves du secondaire d'une école public et une école secondaire privée et été soumise à l'analyse suivante: Analyse des écarts (ANOVA), pair Wise t. test et le coefficient de corrélation de Pearson. Le test ANOVA a révélé qu'il y avait une différence significative dans l'utilisation des trois catégories de stratégies d'apprentissage ($p < 0,05$). Tandis que les multiples comparaisons avec le pair Wise t. test a révélé qu'il n'y a pas deux catégories de stratégies d'apprentissage qui ont été utilisés dans la même mesure par les élèves (p-valeurs de toutes les paires <0,05). L'utilisation de toutes les catégories de stratégies d'apprentissage indique une relation significative avec le rendement scolaire (stratégies d'apprentissage cognitives ont obtenu une p-valeur de 0,01, les stratégies métacognitive d'apprentissage une p-valeur de 0,005 et la gestion du temps et l'environnement étudier une p-valeur de 0,01). L'utilisation de stratégies d'apprentissage métacognitives a montré une association plus significative avec le rendement scolaire que l'une des deux autres catégories de stratégies avec une p-valeur de 0,005 par opposition à 0,01 pour chacune des deux autres stratégies d'apprentissage. Recommandations pour l'enseignement, l'orientation de ces élevé et la formation des enseignants sont proposés.

# GENERAL INTRODUCTION

Academic performance is a very important aspect in the lives of individuals, and often influences other decisions in life. Academic performance is highly associated with social wealth and it is also a strong predictor for vocational, career success and socioeconomic prosperity (Spinath, 2012). Students who graduate from schools with a poor academic performance do not have the required ability that can enable their socio-professional insertion (Lazin, & Neumann, 1991). Mesri (2008) insisting that poor academic performance is a worrying matter states that not only can it cause students to have mental problems but it can also cause them to be at risk of inhibition of education and it might be impossible for students to compensate it. Research has also shown that poor academic performance results in social and psychological problems to individuals and act as a threat to the society (Mayo, 1993). Alikhani et al., (2005) underline that academic failure can cause obstacles in training the human resource that a country needs and thus can be at the root of underdevelopment. As such, the subject of poor academic performance is a serious problem in all countries.

Previous research on the subject of academic performance has revealed that several factors affect the academic performance of students. Some of these factors are innate (intelligence for instance) and cannot be controlled while others can be controlled by students and teachers. One of the factors which can be controlled has been underlined as students' ability to self-regulate their learning.

Self-regulated learning is a concept that insists on the active participation of students in their own learning process. It refers to learning that results from students' self-generated thoughts, actions and behaviours that are oriented systematically toward the attainment of their personal learning goals. According to Zimmerman (1990) self-regulated learning refers to a student's ability to be mentally, motivationally, and behaviourally active in his learning process. Mentally, self-regulated learners plan, set goals, organise, self-monitor, and self-evaluate at different stages as they learn. These processes allow them to be self-aware, knowledgeable and decisive in their approach to learning. Motivationally, they perceive themselves as competent, self-efficacious, and autonomous. To observers, they show extraordinary effort and persistence during learning. Behaviourally, they select, structure, and create their environments for optimal learning.

A distinctive characteristic of self-regulated learners is their use of learning strategies during their learning process (Zimmerman, 1989). The spectrum of learning strategies

expands from simple repetition of information to strategies that enhance the internal motivation of learners. Categorically stating, Pintrich et al (1991) presents four major categories: motivational learning strategies, cognitive, metacognitive, and resource management strategies.

Cognitive learning strategies refer to the actions that students adopt in order to facilitate the organisation and memorisation of the information that is being learned. Pintrich et al (1991) identified three main types of cognitive learning strategies that students use: first, elaboration strategies, by which connections are established between new material and what is already known; second, rehearsal strategies, which help store information in the memory by repeating the material, and third, organization strategies that help students to visualize the material being learned.

Metacognitive learning strategies refer to mental actions that students use to help them become aware of what they know and don't know, understanding what they will need to know for a certain learning task and having an idea of how to use their current skills to learn what they do not know. Pintrich et al (1991) identified three metacognitive learning strategies as consisting of planning, monitoring and evaluation. Planning involves for instance the allocation of study time for various subjects by students, monitoring strategy involves for instance where the learner repeatedly checks whether he/she understands the material, and evaluation involves comparing results obtained to their desired outcomes.

Resource management learning strategies regulate students' time, effort and their study environments (Pintrich et al, 1991). Time management involves scheduling, and managing one's study time. This includes not only setting aside blocks of time to study, but the effective use of the study time, and setting realistic goals. Study environment management refers to control on the setting where a student learns. Ideally, the learner's study environment should be organized, quiet, and relatively free of visual and auditory distractions.

Motivational learning strategies are strategies that students put in place to direct their learning. They include such strategies like formulation of goals, which could be intrinsic or extrinsic; awarding consequences or rewards to learning out comes, attaching a value to the learning task, control of learning beliefs and test anxiety (Pintrich et al, 1991).

According to self-regulated learning theories, students who use self-regulated learning strategies during their learning process will learn better than those who do not use them (Zimmerman, 1989; Schunk, 2001 &Pintrich, 1995). This according to Wine (1996) is due to the fact that the use of learning strategies enables students to act on the information being learned, making it easier for its retention and retrieval when needed. Zimmerman (1989) states that the use of learning strategies enable students to identify knowledge gaps and proceed to fill them, and also be able to stay motivated in their learning, always seeking for opportunities to improve their learning. To him, this is the reason behind the difference in performance outcomes between students who use self-regulated learning strategies and those who do not. Schunk& Zimmerman (1994) state that students who use these strategies have a more adapted cognition, stronger motivational consequences, and better academic activity than students who do not use them.

The positive link between the use of self-regulated learning strategies and academic performance has led to many interventions being made to ensure that students are aware of them. Hofer, Yu, &Pintrich (1998) for instance, developed a Learning to learn intervention course for college students to expose students to various learning strategies. Dignath&Büttner (2008) in a meta-analysis of such interventions found out that most of them were unsuccessful and suggested that for such interventions to be successful and have an impact on academic performance, key strategies that have a strong association with academic performance must be included and continuous feedback on these intervention should be made to help improve upon them.

Cosnefroy (2011) states that the impact of the use of self-regulated learning strategies is not the same for all categories of learning strategies. There are some learning strategies that lead to a deep processing of the information being learned resulting in a superior academic performance and another set of learning strategies that lead to shallow processing of information being learned which has a lesser impact on academic performance.

At the secondary school level of education in Cameroon, it is observed that many students make use of various learning strategies. Guidance counsellors inform these students about various learning strategies during their classroom information sessions. However, the poor academic performance of these students especially during public examinations like the General Certificate of Education (GCE) examinations warrants more research in this domain. It is not certain for instance what type of learning strategies that these students mostly use,

what relationship the use of these strategies has on their academic performance, and which of these strategies have the strongest influence on their performance. This research on the self-regulated learning strategies and academic performance is based on these preoccupations, focusing specifically on three categories of learning strategies: cognitive, metacognitive, and time and study environment management, and as such will provide suggestions on the strategies that students should employ when they learn privately, have teaching and curriculum implications, as well as implications on the practice of guidance and counselling of these students.

# CHAPTER ONE

# THE PROBLEM STATEMENT

## 1.1. CONTEXT AND JUSTIFICATION

By virtue of Section 2 of law No 98/004 of 14 April 1998 on the Orientation of education in Cameroon, education is considered as a national priority due to its significance in individual development and the provision of human resource capital for the realization of national developmental objectives.

Secondary education for some students prepares them to get into higher institutions of learning where they will eventually get professional training. For others, especially those at the technical secondary schools, secondary education equips them with skills that can enable them get employment upon completion or be self-employed. Whatever be the case, the academic performance of students leaving the secondary school level determines whether they succeed to get into higher education or not, get employed or not or even succeed in their personal business. Higher institutions of learning as well as employers often consider students' academic performance before granting them admission or employment. Unfortunately, the statistics of public exams like the G.C.E for the past years reveal that students at this level of education have been performing poorly.

The Table 1.1 shows the results of the ordinary level general certificate examination from 2010 to 2015. This statistic reveals that for the past six years, a pass percentage was only observed in 2010. The number of students who have a poor academic performance in the examination is rising each year for instance from 21782 unsuccessful candidates in 2010 to 60815 in 2015. This research on the self-regulated learning strategies of students and their academic performance is carried out with the view of providing information that could help in improving this academic performance.

| Table 1.1. General Results of GCE O Level from the year 2010-2015 | | | | | |
|---|---|---|---|---|---|
| Year | Number of students that sat for exams | Numberpassed | Numberfailed | Percentagepass (%) | Percentagefail (%) |
| 2015 | 110434 | 49619 | 60815 | 44.93 | 55.07 |
| 2014 | 96056 | 33054 | 63002 | 34.41 | 65.59 |
| 2013 | 81675 | 37380 | 44295 | 45.77 | 54.33 |
| 2012 | 75010 | 32165 | 42845 | 42.88 | 57.12 |
| 2011 | 55378 | 24093 | 31285 | 43.51 | 56.49 |
| 2010 | 51881 | 30099 | 21782 | 58.02 | 41.98 |
| Source: Compiled from MINESEC Annual Statistics 2009–2015 | | | | | |

## 1.2. POSITION AND FORMULATION OF THE PROBLEM

### 1.2.1. Observations

During my internship as a student guidance counsellor, I observed that the highest number of consultations that secondary school guidance counsellors receive is always linked to assistance in improving students' performance. More often, it is usually a demand by a student for the establishment of a personal reading time table that will enable him/her manage their study time. Generally, I observed that students are concerned about their own learning and make efforts towards improvement. Some of them spend sleepless nights studying; others stay after school on campus to learn on their own, others engage in peer group studies while others attend catch up classes. With such efforts, one will expect that many of these students should succeed in their various examinations. Contrary to this expectation, it is observed that some of these students still end up failing in their class and public examinations.

### 1.2.2. The Problem

Poor academic performance is a very serious problem being faced by most secondary school students in Cameroon. The G.C.E Ordinary level statistics for the past six years indicate an average fail rate of above 50%; a situation that can cause many difficulties for individuals and for the entire economy.

Learning is an active process that involves the full participation of the learner. Zimmerman (1989) in his self-regulated learning theory postulates that an active learner will be seen to be engaged in his or her learning process according to three phases and in each of these phases will have to make use of strategies that will enable effective learning.

Craik & Lockhart (1972) theorise that the use of various learning strategies has different impacts on the storage and retrieval of information. Some ensure permanent storage into the long term memory while others only ensure superficial and temporal storage of information that may be difficult to remember. As such the use of various learning strategies will have a different impact on the academic performance of students.

Students who use learning strategies must therefore make use of those that ensure a deep processing of information to attain a good academic performance. This study is based on the following preoccupations: what type of learning strategies are these students using? Are these students using the most important learning strategies? What strategies are associated to a good academic performance? Are some of these strategies more linked to a good performance than others? Which strategies should students rely more on in order to enhance their academic performance? This research seeks to investigate this situation based on the research questions below.

### 1.2.3 RESEARCH QUESTIONS

- **General Research Question**

The general research question that this study seeks to answer is: is there a significant relationship between the use of self-regulated learning strategies by secondary students and their academic performance?

- **SpecificResearch Questions**

This study will focus on the following specific research questions:

1) What is the relationship between the use of cognitive learning strategies and the academic performance of secondary school students?
2) What is the relationship between the use of metacognitive learning strategies and the academic performance of secondary school students?

3) What is the relationship between the use of time and study environment management learning strategies and the academic performance of secondary school students?

4) Which category of strategies has the highest link with students' performance?

### 1.2.4. RESEARCH OBJECTIVE

- **General objective**

The general objective of this research is to investigate if self-regulated learning strategies that secondary school students use have a significant relationship with their academic performance.

- **Specific objectives**

1) To determine if there exist a significant link between the use of cognitive learning strategies and the academic performance of secondary school students.
2) To examine if there is a significant relationship between the use of metacognitive learning strategies and the academic performance of secondary school students.
3) To investigate if there is a significant bond between the use of time and study environment management learning strategies and the academic performance of secondary school students.
4) To determine the strategy that has the most significant link with the academic performance of secondary school students.

### 1.2.5. SIGNIFICANCE OF THE STUDY

Best (1993), cited by Amin (2005), puts it that a researcher must demonstrate why it is worth the time, effort and expense required to carry out a proposed research. An endeavour of this nature is aimed at contributing one's own quota to the development of the society and the advancement of the existing stock of knowledge.

This study will provide students, guidance counsellors, parents, teachers, the state and other researchers in the field of education with information on the use of learning strategies

by secondary school students and possible evidence of the relationship between the use of learning strategies and the academic performance of these students.

For students, the results of this research will inform them of the various learning strategies that they are using and provide evidence of those that have a greater impact on their academic performance. This hopefully will go a long way to encourage students not to neglect these learning strategies during their personal learning.

With regards to the state, the findings of this research will provide information concerning students' use of self-regulated learning strategies and the impact it has on their academic performance that might have implications on curriculum development and teacher training.

For guidance counsellors, information from this research will have implication on their counselling. Knowledge about which learning strategies are more associated to good academic performance will enable them to lay emphasis on them during their information sessions on study techniques to students.

For teachers, information from this research can influence them to plan and deliver their teaching in ways that enhance the development of learning strategies that have a high relationship with performance in their students.

### 1.2.6. DELIMITATION OF THE STUDY

This study is delimited both geographically and conceptually. Geographically, the study would be carried out using five and upper sixth students of a public and a private secondary school in Bamenda II administrative district, in the Northwest Region of Cameroon. As concern the conceptual limitation, the study is situated in the educational domain, precisely on the aspect of self-regulated learning. It shall be dealing with the use of self-regulated learning strategies and the relationship it has with the academic performance of secondary school students.

# CHAPTER TWO

# THEORITICAL FRAMEWORK AND LITERATURE REVIEW

## 2.0. INTRODUCTION

This chapter aims at reviewing related literature on the phenomenon under study. It shall present the conceptual framework and define some key terms, review literature surrounding the research topic as well as the theories that support the research idea, formulate some research hypothesis and present a summary of variables of the study. It shall be divided into five major sub-headings namely: the conceptual framework, literature review, theoretical framework, formulation of hypothesis, and summary of variables of the study.

## 2.1. THE CONCEPTUAL FRAMEWORK

Miles & Huberman (1994**)** defined a conceptual framework as a visual or written product, one that "explains, either graphically or in narrative form, the main things to be studied—the key factors, concepts, or variables and the presumed relationships among them" (p. 18). This section will examine and explicitly elaborate and define self-regulated learning, self-regulated learning strategies, academic performance and also examine the possible relationship existing between them.

### 2.1.1. Learning

The concept of learning is a central concept in education and has been given several definitions

Lachman (1997), sees learning is an important form of personal adaptation and goes ahead to define it as "A relatively permanent change in behaviour based on an individual's interactional experience with its environment". (p.479 )

Biggs & Moore (1993), on their part, define learning as "a process by which behaviour is changed, shaped or controlled" (p. 9).

For Marton, Dall'Alba&Beaty (1993), learning is "a process of constructing understanding based on experience from a wide range of sources" (p.284).

Abbott J (1994), defines learning as that "reflective activity which enables the learner to draw upon previous experience to understand and evaluate the present, so as to shape future action and formulate new knowledge".

In these definitions, learning is highlighted as:

- An active process in which the students relates new experience to existing meaning, and may accommodate and assimilate new ideas

- A means through which past, present and future information are connected

- Vital in influencing actions in future

In this research, learning is defined simply as the process through which students gain knowledge, or skill, through studying, teaching, or experience.

### 2.1.2. Self-regulated learning

The concept of self-regulation is historically linked to works on cybernetics; the science of communications and automatic control systems in both machines and living things (Cosnefroy, 2011). In this field, the central mechanism at the heart of self-regulation is the negative retroaction loop. It is this loop that permits the control of the system. The principle is that, information on the present state of the system for example information on a results obtained at a given moment, is compared to a reference point and the goal to be attained by means of a mechanism called the comparator. If a discrepancy is observed between the present state and the reference value, an action is put in place with the aim of reducing this discrepancy. The retroaction loop is termed negative when the objective is to diminish the greatest possible inconsistencies between the present state and the goal to be attained. A positive retroaction loop on the contrary consists of increasing the difference between the present state and the reference value. This type of figure is particularly frequent in the fields of human conduct with eviction goals, when a person searches all possible ways of distancing a non-desired state.

Later on, the concept of self-regulation opened to a vast field of applications in engineering sciences as well as in life sciences. In psychology, it was dealt with at two distinct levels. At the first level, it retained the attention of researchers for which the capacity to put in place self-regulated behaviours is one of the fundamental characteristics of human functioning. It is the case with Carver &Scheier (1990) who see in human conduct, a permanent movement towards the attainment of different goals. Self-regulation and its old

cybernetics foundation furnished a theoretical framework promoter for producing a human functioning model. In this approach before all decontextualisation, the objective was to construct a theory of human self-regulation independent of any specific field of application. At a second level, the concept of self-regulation was at the service of an applied psychology when it was being associated to a specific field. Research in enterprises in this context aim to show just like in the first level that, self-regulated processes are at the centre of successful adaptation and of success. Three domains have been particularly studied: work and organisational psychology, health psychology and educational psychology; the field in which the concept of self-regulated learning was moulded. In the three domains, the concept of self-regulation is a decisive variable, permitting respectively to increase performance at work, to preserve the wellbeing of human beings and learners' success in their studies (Boekaerts, Maes&Karoly, 2005).

Self-regulated learning is used in educational psychology to stress on the active participation of learners in the learning process. The definition is often given in an indirect manner starting from the characteristics of self-regulated learners. These are persons that find by themselves resources to enter into work, to persist and adapt their functioning to changing work conditions in the course. They are at the origin of efforts invested to acquire knowledge and competences; they adapt their thoughts, their feelings and actions as the need arises, to act on learning and to control it (Hadwin& Winne, 1995). Personal initiative, perseverance and adaptation are distinctive characteristics of persons that are engaged in self-regulated learning (Zimmerman, 1989, 2001). Self-regulated learning is therefore a specific learning mode that permits being autonomous, voluntary and strategic.

Self-controlled, self-disciplined, and self-directed learning are a few words synonymous with self-regulated learning. Just as self-regulated learning has several words with which it can be identified, it also has several definitions. These definitions are the results of different theoretical perspectives on self-regulated learning.

According to Zimmerman (1990) self-regulated learning refers to a process that enables students to be mentally, motivationally, and behaviourally active participants in their own learning. Mentally, self-regulated learners plan, set goals, organize, self-monitor and self-evaluate at different stages as they learn. These processes allow them to be self-aware, knowledgeable and decisive in their approach to learning. Motivationally, they perceive themselves as competent, self-efficacious, and autonomous. To observers, they show extraordinary effort and persistence during learning. Behaviourally, they select, structure, and

create their environments for optimal learning. They seek out advice, information, and places where they are most likely to learn. They self-instruct during knowledge acquisition and self-reinforce during performance enactments.

For Pintrich (1995), self-regulated learning is an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behaviour, guided and constrained by their goals and the contextual features in the environment.

Self-regulated learning refers to the specific ways that students take control of their own learning. It is learning that occurs largely from the influence of students' self-generated thoughts, feelings, strategies, and behaviours, which are oriented toward the attainment of goals. Self-regulated students select and use self-regulated learning strategies to achieve desired academic outcomes on the basis of feedback about learning effectiveness and skill. Self-regulated learners are aware when they know a fact; possess a skill and when they do not. They proactively seek out information when needed and take necessary steps to master it. When they encounter obstacles like poor study conditions or confusing teacher, they find a way to succeed. Self-regulated learners see knowledge acquisition as a systematic and controllable process and they accept greater responsibility for their academic performance outcome (Zimmerman, 1989).

### 2.1.3. Self- regulated learning strategies

According to Cosnefroy (2011),a strategy is a mental tool. It is a deliberate choice or an assembly of means for attending a goal. It is a general rule of action that orientates activities towards a goal with the aim of optimising performance.

Freeman (2004) defined a learning strategy as a student's way of organising and using a particular set of skills to learn content or to perform tasks more effectively in school, as well as in non-academic settings.

Alexander, Graham & Harris (1998) described a learning strategy as a form of procedural knowledge: the 'how to' knowledge. According to them, learning strategies are purposeful in the sense that they are consciously applied to attain a desired outcome.

Cohen (2011; p.4) defined self-regulated learning strategies as 'thoughts and actions, consciously chosen and operationalized by learners, to assist them in carrying out a

multiplicity of tasks from the very outset of learning to the most advanced levels of target performance'.

Zimmerman & Martinez-Pons (1986) defined self-regulated learning strategies as actions and processes directed at acquiring information or skill that involve agency, purpose, and instrumentality perceptions by learners. They include such methods as organizing and transforming information, self-consequating, seeking information, and rehearsing or using memory aids.

In summary, self-regulated learning strategies refer to the thoughts and actions that are consciously deployed by learners to help them to learn more effectively and attain self-set learning goals.They are purposeful actions and behaviours that students engage in when studying to ensure that their goals are attained. A student who has as goal to pass the GCE in good grades may plan the material he has to study for each period, decide to read every night, avoid reading around noisy environments that disturb his concentration, seek help from others when he does not understand some material and undertake a test of what he has been reading each week. By so doing, he is taking actions towards ensuring that his goal of having good grades at the GCE examinations will be attained. All these actions are his self-regulated learning strategies.

This study will look at 3 types of self-regulated learning strategies: cognitive, metacognitive, and time and study environment management learning strategies.

### 2.1.4. Cognitive learning strategies

Weinstein & Mayer (1986) define cognitive strategies as learning tactics that enable students to act directly on the information that is being learned in order to facilitate its organisation and memorisation. For instance, rehearsal, elaboration, and organisation. These strategies can be general or specific.

Pressley& Harris (2006), define general cognitive learning strategies as strategies that can be applied across many different disciplines and situations (such as summarization or memorising), whereas specific cognitive strategies tend to be more narrow strategies that are specified toward a particular kind of task.

In this study, the focus will is on general cognitive strategies that involve rehearsal, organisation and elaboration of information. Indicators of the use of this strategy shall be

students' actions such as: relating material they study to what they already know, draw charts, tables and diagrams, outlining material, reading notes repeatedly, making summarise while they study and memorising information.

### 2.1.5. Metacognition

Flavell (1979, p.906) originally coined the term metacognition to mean "cognition about cognitive phenomena" or more simply "thinking about thinking". Subsequent definitions of this term have retained its original meaning. For example, researchers in the field of cognitive psychology have offered the following definitions:

"The knowledge and control that children have over their own thinking and learning activities" **(**Cross & Paris, 1988**,** p. 131)

"Awareness of one's own thinking, awareness of the content of one's conceptions, and active monitoring of one's cognitive processes, an attempt to regulate one's cognitive processes in relationship to further learning and application of a set of heuristics as an effective device for helping people organise their methods of attack on problems in general" (Hennessey, 1999, p.3)

"Awareness and management of one's thoughts" (Kuhn & Dean, 2004, p.270).

From the definitions of metacognition above,metacognition refers to higher order thinking which involves a student's active control over his mental processes while engaged in learning.

### 2.1.6. Metacognitive learning strategies

According to Zimmerman (2002), metacognitive learning strategies refer to mental actions that students employ to help them plan, monitor and evaluate the progress they are making towards the attainment of their learning goals. They enable students become aware of what they know and don't know, understanding what they will need to know for a certain task to be completed and having an idea of how to use their current skills to learn what they do not know.

Baker & Brown (1984), defined metacognitive strategies as mental routines and procedures that allow individuals to monitor and assess their ongoing performance in accomplishing a mental task. For instance, a student studying for a test may ask himself questions such as: "Am I going to do well? Is there something I don't understand? Am I

learning this material? Are there gaps in my knowledge or understanding? If I do find a gap in my knowledge, do I know what to do about it? Can I repair the gap so that my understanding is complete?" For him, students who use metacognitive strategies are aware of mental resources they have to accomplish a goal, they check the outcome of their attempt to solve a problem, they monitor the effectiveness of their attempt, they test, revise and evaluate their strategies for learning and they use compensatory strategies when comprehensions breakdown. These compensatory strategies help restore their understanding and learning.

In this study, self-regulated metacognitive learning strategies refer to methods used by students to help them understand the way they learn. They are strategies that direct their thinking to detect what they are supposed to learn, set learning goals, plan how to achieve this goals, and while in the learning process, they use these strategies to know what they have learnt, identify the knowledge gaps they still have, and plan how they are to fill in this gap to ensure their learning goals are attained. Indicators of the use of this strategy in this study are students mental acts such as: setting of learning goals, planning how they will be attained, self-questioning what they know and don't know, thinking about material they are to study and deciding what is important to be retained from it, changing study methods to suit that of the teacher or subject they are studying.

### 2.1.7. Time and study environment Management learning strategies

Pintrich et al (1991) define time and study environment management learning strategies as actions that students use to regulate their time and study environment. For them, time management involves scheduling, planning, and managing one's study time. This includes not only setting aside blocks of time to study, but the effective use of that study time, and setting realistic goals. Time management varies in level, from an evening of studying to weekly and monthly scheduling. Study environment management refers to the control over the setting where the student carries out learning. Ideally, the learner's study environment should be organized, quiet, and relatively free of visual and auditory distractions. Indicators of students' use of this strategy in this study will be actions such as, sticking to a study schedule, having a regular place set aside for studying, studying in quiet environments, doing assignments on time, keeping up with weekly readings, attending all classes, reviewing notes before exams

The objective of students' employment of learning strategies as underlined in the definitions above is usually to enhance their learning and attain their goals. To know whether the goal of learning has been attained students' use of learning strategies needs to be compared with their academic performance. This latter notion (academic performance) is the next concept that this section will explore.

### 2.1.8. Academic Performance

According to the Online Psychology Dictionary, academic performance is the outcome of education. It is the extent to which a student, teacher or institution has achieved its educational goals. It represents an assessment measure of the extent to which what is being taught to students is actually being learned by them.

People often consider grades first when evaluating academic performance. This includes higher education institutions who rank students by their Grade Point Average (GPA), awarding special designations such as first class honours for those who have a GPA of at least 3.6 over 4. Scholarship organizations and universities also start by looking at grades, as do some employers, especially when hiring recent graduates.

In secondary schools, academic performance is usually evaluated on the basis of students' test scores, term or annual average and equally through standardised public examinations like the GCE Board examinations. Students with test score, and annual or term average of less than 10/20 (50%) are considered to have performed poorly while for the GCE O Level examination for instance a score of less than 50% corresponding to a grade below C is considered as a poor performance.

Academic performance thus is the means that enable teachers and other educational stakeholders to evaluate whether students are effectively learning what they are being taught. On the part of the students, it is the means through which they can evaluate the degree to which they are attaining their self-set learning goals, success of the learning strategies they put in place and then set new ones or make modifications with old ones. In this study, it is represented by the students' term average.

## 2.2. LITERATURE REVIEW

This section reviews information on research findings concerning the following themes: self-regulated learning and academic performance, categories of self-regulated learning strategies, the impact of self-regulated learning strategies on academic performance, the development of self-regulated learning strategies, measuring the use of self-regulated-learning strategies and interventions that have been made to teach self-regulated learning strategies to students in academic settings.

### 2.2.1. Self-regulated learning and academic performance

Self-regulated learning offers a perspective to learning that shifts the focus of educational analysis from students' learning abilities and environments as fixed entities, to their personally initiated learning processes and responses, designed to improve their abilities and environments of learning (Zimmerman, 1990). This perspective holds the view that even though students' innate learning abilities and the environment under which they learn influences learning, a strong influence also stems from the way these students control their learning and learning environment. Researchers in this field hold the view that any student, despite his abilities or learning environment will have a superior academic performance if he self-regulates his learning than if he withdraws from self-regulating his learning (Zimmerman, 1989; Pintrich, 1991; Cosnefroy, 2011). This view has led to many investigations of self-regulated learning processes that students engage in. Self-regulated learning strategies are one of these processes that have gained the attention of researcher.

### 2.2.2. Self-regulated learning strategies

Researches on the self-regulated learning strategies that students use reveal that there are many types of these strategies. Cosnefroy, (2011) classifies self-regulated learning strategies into three categories: cognitive and metacognitive strategies, volitional strategies, and defensive strategies. Cognitive and metacognitive strategies have as function to optimise the treatment of information by acting directly on the information being learned. He further identifies a trilogy of cognitive strategies as comprising of repetition, organisation and elaboration and another trilogy of metacognitive strategies: anticipation, monitoring and evaluation.

Repetition refers to memorisation strategies. They refer to the repetition of information with the aim of encoding it into ones memory. Repetition permits the learner to learn by heart. Even though repetition does not promote an in-depth understanding of information, Cosnefroy (2011) states that it is useful and important and should neither be neglected or despised.

Organisation refers to internal structuration of acquired knowledge by students, guided by the wish to construct relationship between information gained. It is an activity of constructing schemes. It starts with the grouping of information that then gives way for a synthesis of related points as well as differences and an identification of functional dependence between components of information (Cosnefroy, 2011)

Elaboration englobes all activities that aim at connecting knowledge being acquired to knowledge that is already possessed. Its importance lies in establishing links with other notions already learnt. Students that use this strategy are interested in finding out how the notion learnt could be applied in other contexts, or they reflect on alternative solutions (Cosnefroy, 2011)

Anticipation consists of analysing a task, determining the goals and objectives and planning on the learning strategies to be used to accomplish the goals and objectives. Cosnefroy (2011) goes further to call these strategies orientation conducts and state that students using this strategy often define learning goals and sub goals, establish a detailed plan and allocate resources in time to accomplish goals

Monitoring informs the learner on what is going on during the process of working towards the attainment of set learning goals. It is the feedback dimension and is based on self-observation permitting direct evaluation of quality and results produced. This strategy aims at controlling conduct where necessary to modify results obtained. It is the operation of adjusting ones conduct and its performances. Concretely speaking, the student during a task could: identify errors and correct them; be conscious of inconsistencies and correct them and verify if he is responding effectively to the question posed (Cosnefroy, 2011, p.88).

Evaluation is usually employed after a learning task has been completed. It has a goal to assess the effectiveness of the learning goals that were set. It is this strategy in the last phase of self-regulated learning above that permits students to reformulate learning goals and go through the self-regulated learning cycle.

Defensive learning strategies are coping strategies like defence mechanisms (Cosnefroy, 2011). These strategies are used with the intention to resolve a problem for which no rational decision is required. These strategies have two functions: not to appear incompetent in the eyes of others, as well as one's self. While stating that these strategies are so many, defensive strategies have been classified into three main categories: strategies that limit being confronted with failure or changing the sense attributed to failure in a manner that losses its harmfulness, auto handicap conducts are the second category, while the strategies that guarantee success are the third category of strategies (Cosnefroy, 2011). Defensive strategies that guarantee success include such strategies like cheating and setting of easily attainable goals.

Weinstein and Mayer (1986) classify self-regulated learning strategies in two categories: metacognitive strategies and cognitive strategies. In line with Cosnefroy (2011), they define cognitive strategies as those strategies that focus on information processing such as rehearsal, elaboration, and organization. Metacognitive strategies address the behaviours that the learner displays while engaged in the learning situation. Some of these tactics help students control attention, anxiety, and affect (Weinstein & Mayer, 1986). Metacognition is the awareness, knowledge, and control of ones thoughts. There are three general processes that make up self-regulatory activities: planning, monitoring, and regulating. Planning includes activities such as goal-setting and task analysis. These strategies help to activate, or prime, relevant aspects of prior knowledge that makes organizing and comprehending the material easier. Monitoring activities include tracking one's attention as one reads, and self-testing and questioning. These assist the learner in understanding the material and integrating it with prior knowledge. Regulating refers to the fine-tuning and continuous adjustment of one's cognitive activities.

Zimmerman & Martinez (1986) relied on interviews with high school students about self-reported strategies used in a variety of common learning contexts. They found evidence of students' use of 14 types of self-regulated learning strategies. These strategies were categorized based on a Triadic model formed on the purpose for the use of each strategy. The purpose of each strategy is either to improve students' self-regulation of their (a) personal functioning, (b) academic behavioural performance, and (c) learning environment. They distinguished 14 strategies according to the purpose for employing them as shown in the table below.

| **Table 2.1. Some self-regulated learning strategies and their categories** | |
|---|---|
| **Category** | **Strategy** |
| Strategies that improve personal functioning | Organising and transforming |
| | Rehearsing and memorising |
| | |
| Strategies to enhance behavioural functioning | Goal setting and planning |
| | Self-evaluation |
| | Self-consequences |
| | Monitoring |
| | |
| Strategies to optimise immediate learning environment | Environmentalstructuring |
| | Help seeking |
| | Peer learning |
| | Reviewingrecords |
| | seeking information |
| *Source:* adapted from Zimmerman and Martinez (1986). | |

Pintrich, (1991) identified four categories of self-regulated learning strategies as consisting of; motivational learning strategies, cognitive learning strategies, metacognitive learning strategies and resource management strategies.

Motivational learning strategies are strategies that students put in place to direct their learning. They include such strategies like formulation of goals, which could be intrinsic or extrinsic; awarding consequences or rewards to learning out comes, attaching a value to the learning task, control of learning beliefs and test anxiety (Pintrich et al, 1991).

Metacognitive strategies are routines and procedures that allow individuals to monitor and assess their ongoing performance in accomplishing a cognitive task.There are three general processes that make up metacognitive self-regulatory activities: planning, monitoring, and regulating. Planning activities such as goal setting and task analysis help to activate, or prime, relevant aspects of prior knowledge that make organizing and comprehending the material easier. Monitoring activities include tracking of one's attention as one reads, and self-testing and questioning: these assist the learner in understanding the material and

integrating it with prior knowledge. Regulating refers to the fine-tuning and continuous adjustment of one's cognitive activities. Regulating activities are assumed to improve performance by assisting learners in checking and correcting their behaviour as they proceed on a task (Pintrich et al, 1991).

Cognitive self-regulated learning strategies are mental routines or procedures for accomplishing learning goals like solving a problem, studying for a test, or understanding what is being read. They are learning tactics that enable students to act directly on the information that is being learned in order to facilitate its organisation and memorisation. They include: repetition, organisation and elaboration (Pintrich et al, 1991).

The fourth category of learning strategies identified by Printrich et al (1991) is the resource management strategies. These are learning strategies that students employ to help them manage their learning resources. They include: time management strategies that involve scheduling, planning, and managing one's study time; effort regulation that involves students' ability to control their effort and attention in the face of distractions and uninteresting tasks; peer learning and help seeking that involvescollaborating with one's peers, teachers and other individuals to fill in knowledge gaps.

Based on the classification of self-regulated learning strategies above, the model of Pintrich et al (1991) includes most of the classifications. As such, this study used this classification without including the motivational component.

### 2.2.3. Self-regulated learning strategies and academic performance

The impact of using self-regulated learning strategies on the academic performance of students is a topic that many researchers debate on.

Simona & Carlo (2015)for instance explored the metacognitive and self-regulated learning profile of high school students. The objectives for their research were: (a) to highlight the presence of homogeneous subgroups of students on metacognitive and self-regulated learning strategies and (b) to test group differences on academic performance. The Learning Strategies Questionnaire of Pellerey (1996) was administered to 647 students with an average age of 18.6 years attending their 4th or 5th year of high school and used cluster analysis to analyse their data. Their findings showed that students who were weak in

academic performance showed insufficiency in both metacognitive and motivational aspects as opposed to students who were strong in academic performance.

In another study**,** Sadi&Uyar (2012**)** investigated the relationship between the use of cognitive self-regulated learning strategies and exam grades of a biology lesson. The sample in their study consisted of 300 ninth grade Turkish students and they used a path model to measure and investigate the structural relationships among relevant variables. The Motivated Strategies for Learning Questionnaire (MSLQ) was applied to collect the data. The LISREL program was used to test analysis of variances to determine multivariate relations through path analysis. Results of the study show no direct relations between the use of cognitive self-regulated learning strategies and the exam grades of the student.

However, Cosnefroy (2011) states that the contradiction in literature concerning the impact of the use of learning strategies on the academic performance of students is eliminated when these strategies are first of all classed according to how deep they enable the information learned to be process. He identifies two levels that the use of learning strategies could help process information. Firstly the use of learning strategies could enable deep processing of the information learned and also the use of other strategies could led to shallow processing of the information learned. According to him, the use of strategies that enable deep processing of information learned is often associated with an interest to learn the content of what is being taught. The objective of the learner in this case is often to increase his knowledge, and to progress rather than seeking to do better than his mates. On the other hand, when the reason behind the use of learning strategies is that a student wants to do better than his mates, he will employ more of surface strategies. Cosnefroy concluded in this regard that searching to learn by truly being interested in the content of what one is learning (employing deep learning strategies) without adopting a logic of competition leads to a better academic performance. This is because, the learning strategies that are employed will be strategies that encourage deep processing of information learned and that also guarantee a better structuring of the content being learned.

Bandura (1986) ascribed much importance to a learner's use of self-regulatory strategies. In his view, strategy applications provide a learner with valuable self-efficacy knowledge. This knowledge, in turn, is assumed to determine subsequent strategy selections and enactments; "such representation of knowledge is put to heavy use in forming judgments and in constructing and selecting courses of actions" (Bandura, 1986, p. 454). The next

section presents literature on three categories of learning strategies: cognitive, metacognitive and time and study environment management strategies which this research is focused on.

### 2.2.4. Meta-Cognitive Self-Regulated Learning and Academic Achievement

According toCosnefroy (2011) metacognition is a key component of self-regulation that operates a double mechanism: the first mechanism permits the student to be conscious of his mental functioning, while the second mechanism permits him to evaluate his mental actions. As such, metacognition is essentially an operation of making conscious evaluations on one's proper functioning, which plays a key role in self-regulation.

Allal (2001), considers metacognition as a mental process that is characterised by a particular purpose (cognitive functioning) and by a high level of intentionality, reflection and active regulation. He associates metacognition therefore with regulation while precising that it is difficult to dissociate metacognition from cognition.

Michel Grangeat (1999, p.116) in line with Flavell (put year) states that metacognition can be viewed simply as a mental operation on another mental operation, or a second order mental operation.

Cosnefroy (2011, p. 99) has gone further to describe three criteria to define metacognition as involving the nature of the operation being carried out, the purpose and the function of the operation. For any activity or operation to be referred to as metacognitive, it has to have a mental nature, having the purpose of acting on another mental action with the function of being a component of self-regulation.

Metacognitive strategies are routines and procedures that allow individuals to monitor and assess their ongoing performance in accomplishing a cognitive task. For example, as students are studying for a test they might ask themselves, "Are things going well? Is there something I don't understand? Am I learning this material? Are there any gaps in my knowledge or understanding? If I do find a gap in my knowledge, do I know what to do about it? Can I repair the gap so that my understanding is complete?" Students who use metacognitive strategies are aware of the cognitive resources they have to accomplish a goal, they check the outcome of their attempts to solve problems, they monitor the effectiveness of their attempts, they test, revise and evaluate their strategies for learning, and they use

compensatory strategies when comprehension breaks down. These compensatory strategies restore understanding and learning (Hadji, 2012).

Several researches have been carried to investigate the correlation that exists between the use of metacognitive self-regulated learning strategies and academic performance.

In 2010, S. Al Khatib, examined the predictive association between meta-cognitive self-regulated learning, motivational beliefs and United Arab Emirates college students' academic performance. The research participants included 404 college students enrolled in a variety of general education courses at Al Ain University of Science and Technology in the United Emirates College. Data were collected via seven subscales of the Motivational Strategies for Learning Questionnaire (MSLQ) and was subjected to exploratory factor analysis of the 43 items of the MSLQ, multiple analyses of variance (MANOVA), and regression analysis. Analysis of the data revealed that meta-cognitive self-regulated learning is a significant predictors of college students' performance.

Somaye&Shahla (2016) explored the extent to which foreign learners used metacognitive and self-regulated learning strategies and investigated the relationship of metacognitive and self-regulated learning strategies with these learners' language learning achievement. To these ends, 49 English as foreign language learners, including 8 male and 41 female learners, from several language institutes participated in this study. The Metacognitive Strategy Questionnaire by Item Type and Self-Regulated Learning Strategy Questionnaire was used to collect data of students' strategy use, and compared against the Final English Achievement Test scores of students. The data were analysed by using Pearson product moment correlation procedures. The results revealed the high and medium use for metacognitive self-regulated learning strategies. Moreover, there was a positive relationship between metacognitive and self-regulated learning strategy use with their learning achievement.

In another study,Chen (2002) investigated effective use of self-regulated learning strategies in two different learning environments: a lecture and a hands-on computer laboratory learning environment, for an introduction to information systems course. Quantitative data collected from 197 undergraduates and his findings revealed that effort regulation led to achievement in a lecture-style learning environment. With regard to self-regulated learning, the investigation in this study revealed that meta-cognitive self-regulated learning was one of the predictors of college students' academic performance.

Cobbs (2003)moved away from the normal classroom context to investigate whether students self-regulated learning behaviours bonded with their academic performance in a distance education course. In this research, the sample population consisted of 106 distance learners taking humanities and technical courses offered by a community college in Virginia. Data was collected using 28 items from the Motivated Strategies for Learning Questionnaire and 5 demographically related items. Using factor analyses, multivariate analysis of variance, and regression analyses Cobbs concluded that the employment of self-regulated learning behaviours differed between humanities and technical courses ($p = 0.0138$). Time and study environment management ($p = 0.0009$) and intrinsic goal orientation ($p = 0.0373$) categories reported significant findings in their relationship to academic performance. Metacognitive self–regulated learning behaviours of learners had no significant relationship with the performance of learners. The factors affiliated with time and study environment management and intrinsic goal orientation were used as predictors in the development of a mathematical formula used to predict academic success in a web-based study.

Zahedi &Dorrimanesh (2008) investigating also in the context of distance education had as objective to find out whether the use of metacognitive self-regulated learning strategies has any effect on learners' academic success. The academic success rate of the subjects was determined based on their university average scores. The subjects consisted of 36 distance learners who were asked to fill out Oxford's Strategy Inventory for Language Learning (SILL) questionnaires. For the purpose of analysis, the students were classified as high and low achievers based on their average scores. The results indicate that with an $\alpha$ value set at 0.05, there is no statistically significant correlation between the use of meta-cognitive learning strategies and academic success of the participants

Hassan & Ahmed (2015) set out to verify the impact of metacognitive strategies on academic performance of special education students-in the University of Jazan. The researchers collected data by use of a questionnaire from 26 randomly selected special education students and analysed the data by using the SPSS program. Their findings revealed that special education students show a higher use of metacognitive learning strategies and this has a positive significant relationship with their academic performance.

Lawanto&Santoso (2013), in their study, investigated engineering college students' use of self-regulated learning (SRL) strategies while learning electric circuit concepts using enhanced guided notes. They found out that students who were reported to have greater

awareness of planning, monitoring, and regulating strategies (metacognitive strategies) showed an improvement on their grade performances. On the other hand, the declined group significantly declined in these strategies after using the enhanced guided notes. The findings suggest that it may be valuable to identify high and low performers according to exam scores, evaluate the content of their notes and encourage the students to share their notes with peers. The findings are important in terms of advancing the understanding of the use of note taking in classrooms. This research again supported earlier findings that high-achievers utilized meta-cognitive strategies more effectively to comprehend learning materials in contrast to low achievers.

Kaya &Kablan (2013), also investigated the relationship that exist in the use of self-regulated learning strategies and achievement while focusing on primary science students. The use of learning strategies was measured by the 50-item modified version of the Motivated Strategies for Learning Questionnaire (MSLQ) and the science achievement was measured by a test compiled from the released TIMSS items. Bivariate correlation analysis results showed that among the nine learning strategies that were investigated; seven of them were significantly associated with the science achievement. Multiple regression analysis results showed that among the seven strategies that showed significant relationship with academic achievement, effort regulation, metacognitive self-regulation and critical thinking significantly contributed to the science achievement more than the other variables. Results and implications for instruction were discussed.

The positive correlation between academic achievement and meta-cognitive strategies has also been investigated in a research by Zare-ee (2007). Data collected from 30 randomly selected learners studying English Language and Literature at Kashan University, Iran, indicated that the correlation between reading achievement and meta-cognitive strategy was significant. MANOVA also showed that students at higher levels of reading ability use meta-cognitive strategies more often than less successful readers. The findings of the study suggest that the use of meta-cognitive strategies can account for variation in reading achievement and needs to be promoted by teachers.

Landine& Stewart (1998) investigated the relationship between metacognition and certain personality variables and the role they play in academic achievement. Measures of metacognition, motivation, locus of control, and self-efficacy were used to compare with students' indication of current academic average. These measures were administered to a

sample of 108 grade 12 students in New Brunswick and Newfoundland in Canada. The results indicated significant positive relationships between metacognition, motivation, locus of control, self-efficacy, and academic average. It was concluded that metacognition and these personality variables are related to academic achievement.

Simsek&Balaban (2010) set out in their study to assess the most commonly used learning strategies of undergraduate students and how these strategies were related to their academic performance. Toward this purpose, a 60 item Likert scale was administered to a sample of 278 undergraduate students. The students were selected based on their cumulative grand-point-average as the most successful and the least successful five senior-year students from each majoring area in the faculties of arts, engineering, science, communication, and sports. Results showed that successful students used more, varied, and better learning strategies than unsuccessful students. Female students were more effective in selecting and using appropriate strategies than male students. There were a variety of differences among fields of study; students of fine arts used the strategies least, while students of sports used them the most. The most preferred group of strategies was metacognitive strategies, whereas the least preferred group was organization strategies. The same pattern was found for the level of success, gender, and field of study. They concluded that certain strategies contribute to student performance more than other strategies.

Across numerous tasks and settings, research has shown that learners with strong SRL skills do better than those who lack these skills. Danuwong (2006), in her study investigating student and instructors' perceptions on the use of strategies across tasks and across disciplines in learning and teaching, revealed the importance of all four meta-cognitive processes namely planning, monitoring, problem solving and evaluating strategies in learning English independently. The findings in this research also suggest that the explicit teaching of meta-cognitive strategies should be incorporated into the classroom practices.

The literature review on the relationship that exist between the use of metacognitive strategies and academic performance of students indicate that there is still some uncertainty whether the use metacognitive learning strategies is significantly related to performance or not. While a majority of the studies above provide more support for the view that the use of meta-cognitive self-regulated learning strategies is significantly related to the academic achievement of students at different educational levels and in different context of learning, it is also unclear whether these strategies have a more powerful influence over the academic

performance of students than other learning strategies. Faced with a multiplicity of learning strategies to use, students will need to know those very important learning strategies that should not be neglected in their personal studies if they aim to obtain a good academic performance. Consequently, investigating whether the use of meta-cognitive learning strategies is crucial to improving the academic performance of students is very important and falls within the objectives of the present study.

### 2.2.5.Time and Study Environmental Management Learning Strategies and Academic Performance

Another strategy used by students to self-regulate their learning that has been identified by research is to reduce the distractions in the environment. This is recognized asenvironmental structuring or environmental management(Purdie & Hattie, 1996) and it concentrates on students' efforts to arrange or control their surroundings to make completing a task more likely to occur without interruption. Wolters (1998) found that students reported using various methods for controlling distractions by managing different aspects of how, when, and where they complete particular tasks. The learners reported various aspects of their physical or mental readiness for completing a task. Students did things such as drinking coffee, eating food, or taking naps to make themselves more attentive and to facilitate their ability to finish tasks.

Learning is an active process, and requires effort. This effort can be seen in the amount of time that students spend trying to learn. However, it has been shown that just increasing the amount of study time does not necessarily result on higher academic performance. Delucchi et al (1987) concluded that academic achievement depends not on the total time spend studying but on effective time management and along with other self-management skills. Students may really desire to accomplish their academic goals but do not know how to structure their efforts in order to plan and carryout these goals. Effort regulation is not simply a reflection of a student's desire to accomplish a task, but a self-management strategy that consist of incorporating other resource management strategies such as study environment and time management.

Zimmerman & Martinez (1986**)** found out that students who choose a study environment that is free of distractions so they can concentrate, or restructure the physical environment to be more conducive when preparing for exams end up achieving higher scores

than students who make no changes to their study environment. These students will remove items from their study environment such as televisions, or clean and organize their study environment before beginning an academic task. In my experience as student guidance counsellor on internship in a public secondary school, I observed low achieving students trying to study for test while guidance and counselling lessons were going on. This same observation was made by other interns who were teaching other subjects like geography and mathematics. In addition to having a quiet place, time management is equally an important factor in determining students' academic performance.

Research shows that time planning helps students to better self-regulate their use of time and intend improved students' Grade Point Average (GPA) (Britton &Tesser, 1991). Students who manage their time will set out their study time evenly throughout the week and also set daily study goals. In contrast, students who are poor time regulators will memorise just before a test or an examination and hope for the best. They are associated with low academic performance. Students who incorporate the management strategies cited above into their repertoire of learning strategies often develop the ability to persist and finish their academic task. However, where they still find difficulties, they seek help from social and non-social sources.

Chen (2002) in his investigation on the effective use of self-regulated learning strategies in a lecture and in a hands-on computer laboratory learning environment for an introduction to information systems course also found out that, students obtained higher test scores when they used appropriate strategies to handle distractions and maintain concentration in studying computer and information system concepts.

Zainalipoor, Zarei&Ahangar (2012**)** examined the relationship between self–regulating strategies and academic performance of Hormozgan University undergraduate students. They used a sample consisting of 420 students (247 female and 173 male) selected by stratified random sampling method. Data for students' use of learning strategies was collected with the use of the motivated strategy for Learning Questionnaire of Pintrich et al (1991) and compared with the first semester average of 2010–2011. These data were analysed by statistics methods such as multiple regression and multivariate variance. Their results showed that there is a significant and positive relation between the cognitive, metacognitive, motivational and resource management strategies with academic performance. But only the resource management strategy has a positive and significant relationship with academic

performance in multiple regression analysis. Students' time, effort and study environment constituted important resources that managing them could improve students' performance. The results of this study also showed that there is a significant difference between male and female students in resource management.

### 2.2.6. Cognitive Learning Strategies and Academic Performance

According to Hadji (2012),Cognitive self-regulated learning strategies are mental routines or procedures for accomplishing learning goals like solving a problem, studying for a test, or understanding what is being read, while Weinstein & Mayer (1986) define cognitive strategies as learning tactics that enable students to act directly on the information that is being learned in order to facilitate its organisation and memorisation. They include: repetition, organisation and elaboration. Three types of cognitive strategies that have been identified in previous literature are: rehearsal, elaboration and organisation.

Rehearsal and repetition are often used to mean the same types of cognitive self-regulated learning strategies. They refer to memorisation strategies and usually involve the repetition of information with the aim of encoding it into ones memory **(**Cosnefroy, 2011). This repetition permits the learner to learn by heart. Even though repetition does not promote an in-depth understanding of information, Cosnefroy states that it is useful and important and should neither be neglected or despised.

Weinstein & Mayer (1986) define the organisation strategy as those actions taken by students to ensure internal structuration of acquired knowledge, guided by the wish to construct relationship between information gained. It is an activity of constructing schemes. It starts with the grouping of information that then gives way for a synthesis of related points as well as differences and an identification of functional dependence between components of information.

The elaboration strategy englobes all activities that aim at connecting knowledge being acquired to knowledge that is already possessed. Its importance lies in establishing links with other notions already learnt. Students that use this strategy are interested in finding out how the notion learnt could be applied in other contexts, or they reflect on alternative solutions(Weinstein & Mayer, 1986).

Correlational studies on the use of cognitive self-regulated learning strategies and the academic performance of students do not present consistent results.

Marzieh (2010) sought to compare the learning strategies between under-achiever and upper-achiever students (including both genders) in 3 secondary school grades. This study was designed in retrospective framework. Subjects were high school students in Qazvin Province in Iran, selected by random multi-level cluster sampling method. Among the samples, two 90- person groups were chosen as upper and under achiever students. Participants completed the Learning and Study Skill Inventory (LSSI) form. This inventory assesses cognitive and meta-cognitive learning strategies. To test the hypotheses, independent t-test, one way ANOVA and multivariate regression method were used. It was concluded that upper achieving students used cognitive and meta-cognitive strategies more than the lower group ($p<0.001$) and that girls used learning strategies more than boys ($p<0.000$). No significant difference was found among school grades in using of learning strategies. Meta-cognitive strategies predict academic achievement more effectively than cognitive strategies.

Hosseinilar&Kasaei (2013) used a different methodology: an experimental method, to study the effect of using cognitive and metacognitive strategy on creativity level and academic achievement of high school students. The purpose of their study was to determine the correlation between using cognition and metacognition strategy on creativity level and academic achievement of high school students in area two of education in Tehran. The sample 120 students who were randomly chosen and placed in four experimental and control groups. The member of each group completed the cognition and metacognition strategies of Jamal Abed's questionnaire. The first and second test group were given a cognition and metacognition strategy test. The result of the research indicates that in the fluency factor and elaboration (creativity) there is a significant difference between these two groups. In cognition and metacognition in rehearsal strategy a significant difference between these two test groups and control group was reported. In regression analysis, ingenuity factor (creative) educational improvement was predicted. Between cognition and metacognition strategy, elaboration, semantic strategy has anticipated curriculum improvements. Between comprehension monitoring with fluency factor, elaboration and ingenuity flexibility (creative) and between the elaboration factor, elaboration semantic and fluency factor (creative) correlation is reported. In this research finding, it was suggested that cognition and metacognition strategies should be included in curriculum for the improvement of student creativity factors.

### 2.2.7. Measuring Self-Regulated Learning strategies

There are strategies that self-regulate learners' use that are overt and observable by others. There are some covert occurrences that characterize the self-regulated learner also. Existing measurement of self-regulated learning allow the learner to report both overt and covert behaviours. Many instruments have been constructed to measure the self-regulated learning strategies. Discussed here are three such instruments that have been used in assessing the use of self-regulated learning strategy.

**A) The Motivated Strategies for Learning Questionnaire.**

The motivated strategy for learning questionnaire was developed by Pintrich and his colleagues in 1991. The purpose of the Motivated Strategies for Learning Questionnaire (MSLQ) was to be used as a tool in efforts to evaluate the "Learning to Learn" course at the University of Michigan. The "Learning to Learn" course stressed the concepts of cognitive psychology and how they could be applied to learning strategies (Deming et al., 1994). The MSLQ is a self-report instrument designed to assess students' motivational orientation and their use of different learning strategies. It is based on a general social cognitive view of motivation and learning strategies. In the development of the MSLQ, the learner is considered to be an active processor of information whose beliefs and cognitions are important mediators of instructional input and task characteristics. This instrument acknowledges the relationship between motivation and cognition.

The MSLQ is composed of two main sections: a motivation section and a learning strategies section. The motivation section comprises of 31 items that assess students' goals and value beliefs for a course, their beliefs about their skills to succeed, and their anxiety about tests. There are two subscales within the motivation section that assess perceived self-efficacy. There are another three subscales that are used to measure value beliefs: intrinsic goal orientation, extrinsic goal orientation, and task value beliefs.

The learning strategies section includes 50 items (31 items concerning the use of metacognitive and cognitive strategies and 19 items concerning management of different learning resources). The metacognitive subscale includes planning, monitoring, and regulating. There are three subscales that assess the cognitive strategies students' use: rehearsal, elaboration, and organization strategies. Previous results using the MSLQ suggest that when students engage in some aspects of metacognition, they tend to report planning, monitoring, and regulating and they also do better in terms of actual achievement; which is in

line with general assumptions about self-regulated learning. The resource management items elaborate on regulatory strategies such as time management, environmental structuring, effort, peer learning, and help seeking.

There are 81 total items on the instrument that are scored using a seven point Likert scale. It ask students to report on concrete behaviours in which they engage. The items ask students about actual behaviours they might use as they study their course material.

**B) Learning and Study Strategies Inventory**

In the early 1980s, in response to a need arising from under prepared college students entering higher education, Weinstein and her colleagues began work toward the development of a diagnostic instrument that would assess an individual's learning strategies (Weinstein, Schule, &Cascallar, 1983). The Learning and Study Strategies Inventory (LASSI) was developed to address the need for a diagnostic instrument that could be used by academic advisors, college staffs, or advisors to identify students' strengths and weaknesses. It could provide at-risk students with feedback or information about strategies optimizing their success in a variety of learning situations common to higher education settings (Melburg et al, 1993).

The LASSI is composed of 77 items and includes the following scales: anxiety, attitude, concentration, information processing, motivation, time management techniques, selecting main ideas, self-testing, study aids, and test strategies. Each scale has five to eight items each to which respondents indicate how well the item describes them. The items are scored on a five point Likert scale. The first five scales measure affective strategies that involve personal factors influencing learners' academic performance. The last five scales measure cognitive strategies that cause students to evaluate learning by applying specific techniques such as processing information, reviewing and retaining information for mastery, and preparing for tests.

Eldredge and Palmer (1990) summarized the scales used in the LASSI instrument. The Attitude scale is composed of eight items focusing on student's interest in education and school, and determines the degree to which worrying about tests affects concentration. The function of the eight items in the Motivation scale is to assess students' efforts in staying on task with assignments and maintaining interest. The Time Management scale, with its seven items, examines student use of study schedules and other time management principles related

to achieving academic tasks. The Concentration scale has eight items that focus on student's ability to minimize distractions on class assignments. The eight items in the Information Processing scale address the student's use of mental imagery, verbal elaboration, comprehension monitoring, and reasoning. The Selecting Main Idea scale, with its five items, asks about the student's ability to pick out key points in discussions and textual information. The eight Study Aid items examine the degree to which students create or use support techniques or materials to help them learn and remember new information. The Self-Test scale, containing eight items, focuses on comprehension monitoring, and students reviewing and preparing for class tests. The test asks students if they know how to approach different types of test questions and if they prepare appropriately for tests and quizzes.

The LASSI has also been used to measure cognitive change and affective growth in regularly admitted students and developmental studies students (Nist et al, 1990). The other purpose of the study was to examine the predictability of the LASSI with regards to students' grades in other courses. The instrument was able to show cognitive and affective growth in regularly admitted students and developmental studies students, following a strategy instruction course, and was considered an accurate predictor of grades for regularly admitted students. In 1995, Prus and his colleagues looked at the LASSI being used as a predictive tool. They conducted a study investigating the capability of the LASSI to predict first year academic success of college students. It was to specifically determine the extent to which the scores on the LASSI predicted freshman grade point average and retention. The scores from the scales did provide significant amount of variance in grade point average that was not accounted for by traditional entry-level student background variables such as race, gender, SAT verbal score, SAT math score, and high school rank. Three of the scales (i.e. motivation, concentration, and self-testing) demonstrated significant correlations with retention.

The LASSI has been modified to also assess how high schools students study and learn. The items were modified using high school level vocabulary, and reflect learning tasks and demands on high school environments (Eldredge& Palmer, 1990).

**C) The Self-Regulated Learning Interview Schedule.**

There are few empirical articles that address self-regulated learning strategy usage in environments other than situated learning contexts. "Although research on self-regulated learning in naturalistic contexts is limited to date, it is unlikely that this self-regulated learning emerges directly from formal instruction" (Schunk& Zimmerman, 1998).

Zimmerman and Pons (1986) developed the Self-Regulated Learning Interview Schedule (SRLIS). The SRLIS was pilot tested in six different contexts: classroom, home, writing assignments outside of class, mathematics assignments outside of class, test preparation, and when poorly motivated. The primary purpose of the SRLIS was to measure self-regulated learning strategies. The secondary goal was to determine if there is a correlation between reported use of self-regulated learning strategies and students' achievement track. Another issue of interest, to be discovered by the instrument, is the identification of the self-regulated learning strategies that were most extensively used by high achieving students.

There are 15 categories incorporated in the SRLIS that were determined on the basis of prior research and theory of self-regulated learning. The Interview Schedule is an open-ended self-report instrument and the data collected were measured according to strategy use, strategy frequency, and strategy consistency.

The review of instruments that have been used to measure self-regulated learning strategies above, measure cognitive, metacognitive, motivational and environmental management strategies. In this study, items in the questionnaire to be used are derived from these instruments taking into consideration the fact that they are valid since they are derived from theory, and their reliability has been established by the consistency in the findings of researches that made use of them. The MSLQ, LASSI and the Self-Regulated Interview Schedule have shown reliability over the years. In developing the questionnaire to be used for this study, I still found this instrument relevant. As such, I extracted elements from the MSLQ, while making modifications in the language to suit the level of that for secondary school students who were not the focus group when the instruments were constructed.

### 2.2.8 Development of Self-Regulated Learning strategies

Bandura (1986) in his social cognitive theory underlines the role of the environment in the development of the capacity to self-regulate and development of self-regulated learning strategies. According to Bandura, human functioning involves reciprocal interactions between behaviours, environmental variables, and personal factors (cognitions). Cognitive processes are influenced by the development of intellect that informs behaviours. Cognitively, the development of intellect moves the student from a state of "other regulation" to internal, self-regulation. Environmentally, the social climate provides components (e. g., teachers, parents and peers) from whom students can seek assistance. The capacity for students to self-regulate increases as the student develops the capacity to self-motivate and

sustains appropriate cognition and motivation until the goal is attained. Behaviourally, the gradual acquisition of appropriate learning strategies and attitudes provide the structure for self-regulatory behaviour. The student must actively participate in evaluating the effectiveness of his or her use of behaviours and strategies, and be willing to make necessary changes. Bandura's theory communicates the importance of the environment in the development and use of self-regulated learning behaviours and strategies.

Paris and Newman (1990) summarized research addressing the developmental changes underlying children's capability to regulate their learning. Before the age of seven, children appear naive and overly optimistic about their ability to learn. They begin school with a vague understanding of what is involved in academic tasks. Their strategy knowledge is fragmented; and they rarely reflect on their performance. Effort is viewed as related to success. As the child approaches adolescence, perceptions of learning become more accurate. Understanding of academic tasks is developed and their monitoring of their cognitive strategies grows with age. At this point, it is realized that effort alone is not sufficient for success. These incremental changes are hypothesized to depend on children's building personal theories of self-competence, academic tasks, cognitive strategies, motivation, and social cognitions.

The acquisitions of a wide range of competencies emerge in a series of regulatory skill levels. Boekaerts et al. (2001) addressed four development levels of regulatory skills: observation, emulation, self-control, and self-regulation. The development of self-regulation is dependent upon social agents such as parents, coaches, teachers, and peers.

An observational level of skill occurs when learners are introduced to the major features of a skill or strategy from watching a model executed. Perceived similarity to a model and vicarious consequences of a model's use will determine an observer's motivation to develop the skill further. "Vicarious learning accelerates learning and saves us from experiencing negative consequences" (Zimmerman &Schunk, 2001, p. 128). An observational level of proficiency can be assessed through the description of the strategy or hypothesized results of the strategy used. Teachers who model strategies and verbalize their thought processes as they perform tasks can enhance students' self-regulatory development greatly (Graham & Harris, 1989).

The opportunity for the learner to use the model moves them from the observational level to the emulation level. It is considered to be emulation because there is seldom an exact

imitation of the use of the model; only the general principles of style and function are enforced. This is necessary in the development of self-regulatory skills because learners need to perform strategies personally to incorporate them into their schema. The source of guidance, feedback, and reinforcement is socially driven so the model continues its teaching functionality (Zimmerman &Kitsantas, 1997).

The learner's deliberate practice of skills is demonstrated at the self-controlled level. Performance in the presence of an instructor or reliance on the model makes it difficult to determine whether or not the learner is confident in using the information that is attained from using these environmental cues. The learner may not have moved from the emulation level if these things are still present in the environment. At the self-controlled level, dependency is on representational standards. These include what the learner remembers (images and text) about the model and the teacher's performance in using the model. The learner demonstrates use of self-regulation in a simulated environment structured by the teacher. The scaffolding approached is implemented to promote mastery of skills in the absence of external influences. The acquisition of self-regulated learning skills on requires more than exposure to a teacher or model; it also depends on extensive practice on one's own (Ericsson & Lehman, 1996). This phase focuses on the development of the fundamental processes rather than outcomes.

The final level of self-regulation, is evident when learners can adapt their performance in changing personal and contextual conditions. These changes and modifications can be made through effective self-monitoring and self-reactive processes that have been developed with practice. This sustains motivation and self-efficacy in the process of the skills that have been developed. While the self-regulation is being developed, learning the process is important to assure goal attainment. As a variety of occurrences are experienced and self-efficacy is enhanced, the learner can move from concerns about the process to setting specific performance goals that will produce outcomes.

The development of self-regulated learning strategies is neither a function of intelligence; nor is it developed automatically through maturation; nor is it acquired passively and reactively from the environment. Self-regulation is not inherent, but it is a learned response that can be taught and controlled by the learner (Iran-Nejad, 1990). It is for this reason that some institutions and researchers have instituted the teaching of self-regulated learning strategies and behaviours to their students. These efforts at teaching self-regulation shall be the focus of the next section.

### 2.2.9. Efforts towards teaching Self-Regulated Learning Strategies

The positive link between the use of self-regulated learning strategies and academic performance in many researches has encouraged researchers to find the most effective method of teaching self-regulated learning to students.

Pintrich and his colleagues developed the Learning to Learn intervention for college students (Hofer, Yu, &Pintrich, 1998). Learning to learn is an undergraduate course designed to teach students basic concepts of cognition and motivation, develop a repertoire of learning strategies, and have them apply these to improve their self-regulated learning. Students attend lectures and participate in laboratories. Topics include principles of information processing, note taking, test preparation and taking, goal setting, and time management. Assessment of the course's effectiveness continues, with evidence suggesting that the course increases students' mastery goals, self-efficacy, and interest and value for the course and decreases test anxiety. There also are reported gains in self-regulatory strategy use.

Weinstein, Husman, and Dierking (1988) described a university course in strategic learning that teaches students to use several steps in working on academic material: set a goal, reflect on the task and one's personal resources, develop a plan, select potential strategies, implement strategies, monitor and evaluate the strategies and one's progress, modify strategies as needed, and evaluate the outcomes to determine if this approach should continue to be used. Prior to the course students complete the Learning and Study Strategies Inventory, and instructors use this information to help students improve their skills, motivation, self-regulation, and academic environment.

Dignath and Büttner (2008) conducted a more recent meta-analysis of 74 studies, assessing the impact various characteristics of successful self-regulated learning interventions have on the improvement of academic performance, strategy use, and motivation among students at both the secondary and primary school level. They found that interventions, when taught at a secondary level, should be developed based on a specific theory of self-regulated learning that emphasizes the use of specific metacognitive strategies, rather than focused on improving student motivation. They also found that interventions are more effective if they are of longer duration and taught by a researcher rather than the classroom teacher. Self-regulated learning only becomes effective when supplemented by feedback and metacognitive reflection on one's own strategy use. It is critical for students to understand the benefit of using the strategies they are being taught; furthermore, they found that creating a

collaborative learning environment is beneficial in enhancing the reflection process. Their overall conclusion was that self-regulated learning can be effectively implemented at both the secondary and primary school level.

In Cameroon, following the publication of the Guidance Counsellor's terms of Reference (MINESEC, 2009), guidance counsellors have been assigned the duty to teach public secondary school students techniques of learning subjects taught, with the specific objective being to enable students to learn how to learn. In module II: Assistance to the academic success of the student, under training session 2 of this Terms of Reference, the content of what is to be taught is clearly elaborated. It consists of the following themes: managing curricular and extracurricular time; techniques for assimilating knowledge in various subjects and preparing for exams. Investigating on the self-regulated learning strategies that secondary school students use and the effect they have on their performance in Cameroon, will raise consciousness on the this theme, provide feedback on the current situation of students use of learning strategies and the results will have implication on the content of the learning techniques that guidance counsellors teach to students.

## 2.3 THEORITICAL FRAMEWORK

A theory is a set of ideas propounded by a person or a group of persons to explain a given phenomenon which has been proven through a scientific research. Generally, a theory makes an attempt to explain a natural, social, or psychological phenomenon through the use of organized statements that involve facts, principles, concepts and assumptions. Burton (1974) and Patterson (1973) cited by Makiyighome, (2003; 15) state that a theory integrates known facts and knowledge into a comprehensive framework. Therefore theories help in the advancement of knowledge, research and professional practice.

The basis of the use of learning strategies to learn lies in theories that explain how individuals learn. Learning theories have evolved over the years from their original roots in behaviourism to cognitive approaches. This study is based on five of these theories: information processing theories, constructivist theories, metacognitive theories, social cognitive theories and self-regulated learning theories.

### 2.3.1. Information Processing Learning Theories

Information processing theories explain how people learn by focussing on how information is registered and retrieved in the memory.

- **The levels of processing model of memory (Craik and Lockhart, 1972)**

This theory concentrates on the processes involved in storing and retrieving of information in the memory. The basic idea is that, memory is really just what happens as a result of processing information and the way information is stored affects the way it is remembered. The deeper the level of processing, the easier the information is to recall.

Craik and Lockhart identify two ways in which information can be processed: shallow processing, and deep processing.

**A. Shallow Processing**

Shallow processing takes two forms:

1. Structural Processing, which is when we encoded only the physical qualities of something (the appearance of things)
2. Phonemic Processing, which is when we encode sounds

They state that, shallow processing only involves maintenance rehearsal (repetition to help us hold the information in the short term memory) and leads to fairly short term retention of information.

**B. Deep Processing**

Deep processing involves semantic processing. This happens when we encode the meaning of information or a word and relate it to similar meaning. It involves elaboration rehearsal which involves a meaningful analysis of information and leads to better recall.

Applying this theory to the use of learning strategies, we can say that students who use SRL strategies that enhance deep processing of information will be able to store and recall the material learned easily than students who use SRL strategies that only enhance shallow processing of information. As such strategies that enhance deep processing of information learned should have a higher significant relationship than those that only enhance shallow processing of information.

### 2.3.2 Constructivist Theories of Learning

In constructivist learning theories, the key idea is that students actively construct their own knowledge as the mind of the student mediates information input from the outside world to determine what the student will learn. Learning is seen as an active mental work, rather than a passive reception of teaching.

- **The theory of cognitive Development by Jean Piaget elaborated inPritchard, A., (2009)**

Jean Piaget, who is considered to be one of the most influential early proponents of a constructivist approach to understanding learning, is one of the best known psychologists in the field of child development and learning. He is the proponent of the 'cognitive developmental stage' theory, which sets out age-related developmental stages. The stages begin with the sensori-motor stage and end with the stage of formal operations.

During the sensori-motor period (0-2 years), Piaget said that a child's cognitive system is more or less limited to motor reflexes which are present at birth, such as sucking. The child builds on these reflexes to develop more sophisticated behaviour. Children learn to generalise specific actions and activities to a wider range of situations and make use of them in increasingly complex patterns of behaviour.

At Piaget's pre-operational stage (2-7 years), children acquire the ability to represent ideas and to engage in mental imagery. In particular they do this through the medium of language. They have an egocentric view; that is, they view the world almost exclusively from their own point of view and find it difficult to consider situations from another's perspective.

In the concrete operational stage (7-11 years), children become more able to take another's point of view and they begin to be able to take into account multiple perspectives. Although they can understand concrete problems, Piaget argued that they cannot deal effectively with more abstract problems.

At the stage of formal operations (11 years and above), children are capable of thinking logically and in the abstract. Piaget considered this stage to be the ultimate stage of intellectual development, and said that although children were still in a position of having relatively little knowledge, their thought processes were as well developed as they were ever likely to be.

Another aspect that Piaget highlights in his theory is the ways in which new information is dealt with by young learners. For him, learners draw on their experience of the

world around them in many different forms, and work to make sense of what they perceive in order to build an understanding of what is around them. He identifies two processes involved: accommodation and assimilation, and state that when equilibrium is arrived, the student attains a stable state.

-Assimilation is the process whereby new knowledge is incorporated into existing mental structures .The knowledge bank is increased to include new information.

-Accommodation is the process whereby mental structures have to be altered in order to cope with the new experience which has contradicted the existing model.

-Equilibration is the process of arriving at a stable state where there is no longer a conflict between new and existing knowledge.

### 2.3.3 Metacognitive Learning theory

The term is most related to John Flavell, who defined it as one's knowledge concerning one's cognitive processes and products or anything related to them. Metacognition refers, among other things, to the active monitoring, regulation and orchestration of cognitive learning processes (Flavell 1976).

Flavell (1976) theorized that metacognition entails both metacognitive knowledge and metacognitive experiences.

Metacognitive knowledge is the knowledge that an individual has about the way they think. He postulates that when learners are aware of the way they think, they can use this knowledge to understand and to control their mental processes. To work metacognitively is to consider and take active control of the processes involved in learning and thinking as they are happening. Flavell (1979) describes three basic types of awareness, related to metacognitive knowledge.

- The first is an awareness of knowledge, which is described as an understanding of what one does and does not know, and what one wants to know.
- Secondly, there is an awareness of thinking, which describes an understanding of cognitive tasks and the nature of what is required to complete them.
- Finally, there is an awareness of thinking strategies, which describes an understanding of approaches to directed learning.

The other category "metacognitive experiences," refers to a person's subjective internal responses to his own metacognitive knowledge, tasks, or strategies. Flavell described metacognitive experiences as monitoring phenomena, which can control cognitive activities,

and ensure that a cognitive goal has been achieved. These processes help to regulate and manage learning, and consist of planning and monitoring cognitive activities, as well as checking the outcomes of those activities.

### 2.3.4 Social Cognitive Theory of Albert Bandura (1986)

Bandura (1986) came up with a theory to explain human behaviours. He explained a triachic determinant effect between environmental, personal influences and behaviour. According to this theory, the environment has a reciprocal effect with peoples' behaviour, personal influences also have a reciprocal relationship with behaviour, and personal influences also shape and are shaped by environmental effects.

According to this theory, a student's mental processes (cognition) will be influenced by the behaviour he/she adopts as well as this behaviour can also shape the mental processes of the student. A student who uses learning strategies (behaviour) will have his/her mental processes (learning) also shaped by this behaviour.

In view of the theory, the student's academic achievement is a product of interaction of his personal cognitive influences and the study behaviour he develops based on his expectations of the outcome of his actions.

### 2.3.5 Self-Regulated Learning Theory of Zimmerman (1989)

Zimmerman in his self-regulatory learning theory sees learning as a process that involves engagement and active participation of the learner. He described students' engagement in their learning processes as self-regulated learning. He went further to describe self-regulated learning to be a cyclical process involving three phases, each involving several process and sub processes that occur within. For him, learners when engaged in their learning begin at the forethought phase, then proceed to the performance/volition control phase and then end up in the self-reflection phase.

#### Phase 1: Forethought

It is the initial phase in which students when engaged in their own learning begin with. In this phase, they approach learning task, analysing it, assessing their capacity to perform it with success and establishing goals and plans regarding how to complete it. Zimmerman underlined that students' task interest and the goal orientation play a crucial role to achieve adequate planningand performing their learning task appropriately. Students carry

out two main activities in this phase. First, they analyse what the task characteristics are by creating a first representation of how it should be performed. Second, they analyse the value the task has for them, this conditions their motivation and effort, and therefore, the attention they will pay during the performance; in other words, their activation of self-regulatory learning strategies. These two activities are presented in details below.

**Task analysis**

According to Zimmerman, the self-regulatory cycle starts with the task analysis where the task is fragmented into smaller pieces and the personal strategies for the performance are chosen based on previous knowledge and/or experience. It is during this activity that goals and strategic planning are established, which are key conditions for self-regulation to occur.

Students consider two crucial variables when establishing their goals: the assessment criteria and the performance level they want to achieve. The assessment criteria are the standards against which the performance will be assessed (e.g., a criterion for a summary is that it should contain the main idea from the text that is being summarised). The problem comes when the students do not know these criteria. When this happens, students have more difficulties establishing appropriate goals.

The second factor that influences goal setting is the student's desired level of performance, which interacts with the assessment criteria. For example, if for a particular task a student knows that to achieve an excellent level of performance he or she has to put forth a lot of effort, but however, the student's interest for that task is low, having an outstanding performance will not be a goal for that student. Even if the teacher communicates the assessment criteria, this student does not value the activity as much to do the effort needed for an excellent performance thus, he will end up perform either poorly or averagely.

It is after analysing the task that a student can engage in strategic planning, which is involves elaborating an action plan by choosing the strategies needed to succeed in the task (e.g., setting steps). In summary, task analysis helps with planning that is crucial for self-regulation. Nevertheless, the implementation of the planning depends on the students" motivation to achieve the established goals, this will be analysed next.

**Beliefs, value, interest and goals**

The beliefs, values, interest and goals are the personal variables that generate and maintain the motivation to perform a task. The motivation to perform a task is the result of the interaction of these variables.

*Self-efficacy* expectations are beliefs about the personal capability to perform a task. They are key for students' motivation, for example, if a student does not consider himself or herself capable of accomplishing a learning task, his or her motivation will decrease and he will not want to make any effort for ameliorating his performance. On the contrary, if the self-efficacy expectations are high, students are more motivated anduse the strategies needed to face the difficulties during the performance of the task.

Second, *outcomes expectations* are beliefs about the success of a given task. Similarly to self-efficacy, if students have low outcome expectations they will not make the effort needed to succeed. Both types of expectations are highly correlated and the higher the self-efficacy expectations the higher the out expectations tend to be.

Third, *interest* and *task value* are variables that energise the student's initial approach to the task. These two variables have different characteristics. On one side, we have the *task value* (utility), which is the importance that the task has for the student's personal goals. If the students perceive that the task is useful, their *motivation to perform it and to learn from it* will raise and they will activate more learning. This is the reason why it is recommended that when teachers introduce an activity, they mention or help to perceive its utility to increase students' motivation. On the other side, we have *interest* to perform a task. It can be personal -activated bythe personal meaning the task has for the person; or situational– activated by task characteristics. It is clear that personal interest and task value can sum effects to enhance the energy invested in a task. Task value seems to be a modulator that contributes to the increase or decrease of the interest and so, motivation moves in the intrinsic-extrinsic continuum. .

Fourth, another important variable for motivation is the *goal orientation,* which is the students‟ belief about the purposes of their learning. Zimmerman states that goal orientations have an effect on self-regulation even if this is a general judgment of their learning, based on previous experiences.

The four processes just presented- are interrelated and they interact during the self-regulatory process, in the initial phase: fore-thought. Their influence can happen within a very short time, therefore, students might not even be aware of them happening. However, their relevance is extremely high as they determine the initial movement, in which students move from analysing and visualising the tasks to actually performing it.

**Phase 2: Performance/Volition control**

In this phase the performance of the learning task by the student takes place. Zimmerman states that during performance, it is important that the students keep their concentration and that they use appropriate learning strategies for two reasons. First, so their motivation does not decrease, second to keep track of their progress towards their goals. The two main processes that take place during the performance are self-observation and self-control, and in order for them to work successfully a number of strategies can be followed.

**Self-observation**

A prerequisite to control the task process is that students have a clear understanding of the adequacy and quality of what they are doing, so if it is correct they can continue and if not they can change it. For students to self-observe successfully, there are two types of actions they can perform; one of a cognitive nature and the other of external help. The first type of action is *self-monitoring,* it is a similar process to self-assessment with the only difference being that self-assessment takes place once a task has been finished and self-monitoring occurs during the performance. The second type of action that favours self-observation is *self-recording,* which is recording the actions that are being done during the performance. It is then an external strategy to help monitor and enhance reflection once the task has been done. Using self-records, students can be aware of things that could have gone undetected before.

**Self-control**

During this process students maintain concentration and interest in the learning task by the use of various strategies. These strategies include both cognitive and metacognitive strategies that are used to maintain concentration and motivational strategies that are used to maintain interest. Students have to have a clear understanding for the task, before they can use *specific strategies* to perform the task. He goes ahead to highlight time management, environmental structuring, self-instruction, imagery, self-consequences, incentives, help seeking ,self-recording and self-monitoring as strategies that students use during this process.

**Phase 3: Self-reflection**

The third self-regulatory phase involves processes that occur after learner efforts have been exercised. Self-reflection includes the following actions: self-evaluation, attributions, self-reactions, and adaption.

Self-evaluation is the comparison of information attained from self-monitoring to some standard whether set by the instructor or the learners. Immediately following the comparison of these two pieces of information, attributions are made in response to the results. Self-regulated learners tend to attribute failure to correctable causes and success to personal competence.

Attributional processes are critical in the self-reflection phase of learning because the results of the information attained when comparing self-monitoring information to self-evaluative information is what affects the motivation of learners to continue the learning process and attainment of the desired goal. Attributions of strategy use also reinforce variations in approach until the learner discovers the strategy that works best for them in the environment. These variations in approach are evident in the adaptation of a learner's academic learning method. Several repeated trials are needed for eventual mastery. The attributions assist in identifying the source of learning errors to strategy use, learning methods, or insufficient practice and adapt the learners' performance to more successful learning situations. Adaptation is a function of goals, accurate monitoring, and appropriate self-evaluation.

The phases of self-regulatory processes are self-sustaining in the fact that each phase (i. e., forethought, volition or performance control, and self-relection) creates inertia for the next phase. The forethought phase prepares the learner for and influences the actions and strategies the learner employs in the volitional or performance control phase. Information gathered during the performance control phase is used in a comparative basis in the self-reflection phase. The self-reflective phase of self-regulation influences the forethought phase through self-efficacy of mastering the skill, learning goal orientation and intrinsic interest in task. The self-reflection phase also influences goal setting and strategic planning in the forethought process. Information from the self-reflection processes of attribution and adaptation will affect the learner's motivation to implement a plan that will result in success of goal attainment. The success of the strategy used, attributed to something correctable, will motivate the learner to modify the strategy and implement it again. Otherwise, the learner

will attribute the failure of the strategy to ability and may change the goal or set an easy or difficult goal based on erroneous attribution of failure.

In summary, the self-regulated learning theory of Zimmerman postulate learning as an active process where the learner has to be actively engaged. It describes the use of specific processes, strategies, or responses for student to improve their learning. For him, students who are engaged in their learning actively set goals, then come up with strategies to accomplish these goals and finally evaluate the effectiveness of their strategies against the outcomes that they observe. Where the outcome is positive, they retain the strategy. However, where it is negative, they modify or change the strategy until the expected outcome is attained. The strategies which produce positive outcomes are all retained and become the repertoire of the student's self-regulated learning strategies which he employs when the need arises. He emphasizes the use of learning strategies as being necessary for the achievement of a good academic performance.

## 2.4. FORMULATION OF RESEARCH HYPOTHESIS

From the theories and literature reviewed above, the following research hypotheses have been made:

**General Hypothesis:**

There exist a significant relationship between the use of self-regulated learning strategies and the academic performance of students.

**Specific hypothesis:**

**H1:** There exist a significant relationship between the use of cognitive learning strategies and the academic performance of secondary school students

**H2:** There exist a significant relationship between the use of metacognitive strategies and the academic performance of secondary school students.

**H3:** There exist a significant relationship between the use of resource management learning strategies and secondary school students; academic performance.

**H4:** Some learning strategies have a greater significant relationship on the academic performance of secondary school students than others.

## 2.5. VARIABLES OF THE STUDY

A variable is a characteristic or attribute of an individual or an organization that: (a) can be measured or observed by the researcher and that, (b) varies among individuals or organizations studied (Creswell, 2012; pg.630). Elmes et al (1995) states that, 'variables are what make experiments run'. The independent and independent variables used in this study are explained subsequently.

### 2.5.1. The Independent Variable

The independent variables in this study are self-regulated learning strategies of students. Three of these strategies manipulated in this research are: cognitive learning strategies, metacognitive learning strategies and time and study environment management learning strategies.

### 2.5.2. The Dependent Variable

The dependent variable is the academic performance of the students.

| Table 2.6 SUMMARY TABLE OF THE VARIABLES OF THE STUDY | | | | | |
|---|---|---|---|---|---|
| **General research hypothesis** | **Specific research hypothesis** | **Variables** | **Indicators** | **Modalities** | **Items** |
| Students' use of self-regulated learning strategies have a significant influence on students' academic performance | The use of cognitive learning strategies have a significant influence on students' academic performance | Cognitive learning strategies | Relating material, draw charts tables and diagrams, outlining material, reading notes repeatedly, summarise, memorising words | Very untrue of me.<br>Untrue of me.<br>Neutral.<br>True of me.<br>Very true of me. | 1-8 |
| | | Academic performance | Students' first and second term averages | 0-5, 5-10, 10-15, 15-20 | 27-28 |
| | | | | | |
| | The use of metacognitive strategies have a significant influence on students' academic performance | Metacognitive learning strategies | Self-questioning, thinking about material, changing study methods Determine material to learn, setting learning goals | Very untrue of me.<br>Untrue of me.<br>Neutral.<br>True of me.<br>Very true of me. | 9-17 |
| | | Academic performance | Students' first and second term averages | 0-5, 5-10, 10-15, 15-20 | 27-28 |
| | | | | | |
| | The use of time and study environment management | Time and study environment management learning strategy | Sticking to a study schedule, regular | Very untrue of me. | 18-26 |

| | | | | | |
|---|---|---|---|---|---|
| | learning strategies has a significant influence on students' academic performance | | place set aside for studying, studying in quiet environments, doing assignments on time, keeping up with weekly readings, attending all classes, reviewing notes before exams | Untrue of me.<br>Neutral.<br>True of me.<br>Very true of me. | |
| | | Academic performance | First and second term averages | 0-5, 5-10, 10-15, 15-20 | 27-28 |
| | | | | | |
| | There is a significant relationship between the type of learning strategy used and the academic performance of secondary school students | Type of learning strategy | Cognitive, Metacognitive, Time and study environment management. | Same indicators for the use of each strategy as above | 1-26 |
| | | Academic performance | Academic performance | 0-5, 5-10, 10-15, 15-20 | 27-28 |

## Conclusion

This chapter has elaborated some key concepts, reviewed literature surrounding learning strategies, explained the self-regulated learning theory of Zimmerman (1989), presented the hypothesis of the present research as well as discussed the variables of the study. The next chapter will focus on presenting the research methodology that this research used.

# CHAPTER III

# RESEARCH METHODOLOGY

## 3.0. INTRODUCTION

This chapter presents an explanation of the methods and instruments used in carrying out the research. It comprise of the following sub topics: The type of research, research area, population of the study, sample and sampling technique, choice and construction of the research instrument, validation of instrument, reliability of the instrument, data collection procedures, method of data analysis and conclusion.

## 3.1. TYPE OF RESEARCH

This study on the self-regulated learning strategies of secondary school students and academic performance is a correlational study. It seeks to establish if the use of self-regulated learning strategies by secondary school students can be correlated with their academic performance. In order to accomplish this main objective, the study adopted a survey research design.

Survey research designs are procedures in quantitative research in which investigators administer a questionnaire to a sample or to an entire population of people with the aim to describe the attitudes, opinions, behaviours, or characteristics of the population. In this procedure, survey researchers collect quantitative, numbered data and statistically analyse the data to describe trends about responses to questions and to test research questions or hypotheses. They also interpret the meaning of the data by relating results of the statistical test to past research studies. The type of survey research design adopted in this study is the cross-sectional survey design. The cross sectional survey design is specifically used in this study because it can examine attitudes, beliefs, opinions, and practices of a large population in a very short amount of time.

## 3.2. AREA OF THE STUDY

This study was carried out carried out in the Bamenda II sub division, of the Mezam Division. Bamenda II is an urban community created by Decree No.2007/117 of 24/4/2007

whose administrative center is in Mankon. This site was purposively chosen because the area is easily accessible, having several secondary schools which the researcher can have access to.

## 3.3 THE POPULATION OF THE STUDY

### 3.3.1. Target population

According to Nwana (1985), the term "population" is generally used to denote those individuals with estimated characteristics, whose elements can be studied and who are living in a geographical area". This study is interested in all the students of secondary education in Cameroon. However, because it was not possible to carry out such a study on all of these students in the limited time available, form 5 and upper sixth students of Bamenda II sub division in the Mezam division of the North West Region of Cameroon were particularly targeted. The choice of these classes lies in the fact that these students are in the examination classes and are assumed to be making maximum efforts towards succeeding in their end of course examinations. They will therefore provide more accurate information on their use of learning strategies.

### 3.3.2. Accessible population

The population that this study accessed constituted form five and upper sixth students of one public and one private secondary school in the Bamenda II sub division. The students from the private secondary school were from the Presbyterian Secondary school (P.S.S) Mankon, whereas the population obtained from the public secondary school were drawn from Government High School (G.H.S) Mankon.

**Table 3.1 Accessible population**

| School | Number of students in Form five | Number of students in upper sixth | Total |
|---|---|---|---|
| P.S.S Mankon | 107 | 90 | 197 |
| G.H.S Mankon | 181 | 127 | 308 |
| Total | 188 | 217 | 505 |

## 3.4 SAMPLE AND SAMPLING TECHNIQUE

The convenience sampling technique was employed in this study. Questionnaires were administered to students on the basis of them being present in school during the days that the research was conducted.

The sample size was obtained by calculation using the formula for sample size provided by Krejcie, R. & Morgan, D (1970). A sample of 341 students was obtained using a 5% margin of error and 99% confidence level from a total population of 505 students who constituted the accessible population. The formula for sample size determination used is stated below.

Formula for sample size determination

$$n = \frac{x^2 * N * P * (1-P)}{( ME^2 * (N-1) + x^2 * P (1-P) )}$$

where:

n = sample size

X2 = Chi square for the specified confidence level

N = Population size

ME = Desired Margin of error

**Table 3.2. Distribution of the students who participated in the study from P.S.S Mankon**

| Class | Total population of students | Number of students that participated in the study | Percentage of students that took part in the study (%) |
|---|---|---|---|
| Form 5 | 107 | 80 | 75 |
| Uppersixth | 90 | 70 | 78 |
| Total | 197 | 150 | 76 |
| Source: Constituted by researcher from field data. | | | |

| Table 3.3. Distribution of the students that participated in the study from G.H.S Mankon | | | |
|---|---|---|---|
| Class | Total population of students | Number of students that participated in the study | Percentage of students that took part in the study (%) |
| Form 5 | 181 | 125 | 69 |
| Uppersixth | 127 | 91 | 72 |
| Total | 308 | 216 | 70 |
| Source: Constituted by researcher from field data. | | | |

## 3.5DESCRIPTION OF THE RESEARCH INSTRUMENT

The data collection instrument that this research used was a questionnaire. This instrument was chosen because of its ability to collect data from a large population over a short period with regards to their opinions and practices. The questionnaire was made up of open and closed ended questions that were sub divided into three sections (sections A to C).

Section A contained questions on the demographic information (school, class, age, sex) of the participants. These questions were both open and closed ended. The questions on class and school were left open for the research participants to fill, while for the questions on the sex and age of participants, possible responses were provided for the participants to select from.

Section B of the questionnaire was based on participants' use of self-regulated learning strategies. Questions in this section were selected and adapted from the Motivated Strategy for Learning Questionnaire (MSLQ) of Printrich et al (1991). The MSLQ is a questionnaire that measures students' motivation to learn and their use of learning strategy. It consists of two sections: a motivation section and a section on the use of self-regulated learning strategy. In the questionnaire that this research used, twenty six questions from the self-regulated learning strategy section were used. These statements describe students' use of cognitive, metacognitive and time and study environment management learning strategies. Students were expected to indicate how true these statements described their self-regulated learning habits. Twenty two of these statements described positive self-regulated learning

strategies while four described negative self-regulated learning strategies. The responses to the statements in this section were closed ended, based on a 5 point Likert scale ranging from very untrue to very true. Students were expected to tick the column that designated how true each of the statements in this section describes their learning strategies. For the positively worded statements, for example; "when reading, I make up questions to help me focus my reading", Neutral was assigned a score of 0, very untrue a score of 1, untrue a score of 2, true a score of 3 and very true a score of 4. For the negatively worded statements, their responses were assigned a reverse score. For instance: "I often find that I don't spend enough time studying because of other activities", a response of neutral = 0, very true= 1, true = 2, untrue = 3 and very untrue = 4.

Section C, was aimed at collecting information on students' academic performance. Here, students were required to state their averages for the first and second term of the current school year. They were expected to respond by ticking from a list of four ranges provided, the range that corresponded to their average for each of the terms. The ranges provided were: 0-5, 5.1-10, 10.1-15, and 15.1-20.

### 3.6. VALIDATION AND RELIABILITY OF RESEARCH INSTRUMENT

Validity according Creswell (2012), is the development of sound evidence to demonstrate that the intended test interpretation (of the concept or construct that the test is assumed to measure) matches the proposed purpose of the test. According to Amin (2005, pg. 285), "a research instrument is said to be valid if it actually measures what it is supposed to measure" The Motivated Strategy for Learning Questionnaire (Printrich et al, 1993) from which the questionnaire for this research was adapted, has shown great reliability and validity values.

Using data from their sample of 380 students, the authors of the MSLQ completed a number of statistical tests to determine the reliability and validity of their instrument. First, the authors completed two confirmatory factor analyses to determine "the utility of the theoretical model and the operationalization of the MSLQ scales" (Pintrich et al., 1993, p. 805). One confirmatory factor analysis was completed for the set of motivational items and another for the set of learning strategies items. Unlike exploratory factor analysis, confirmatory factor analysis requires the identification of which items (indicators) should fall onto which factors (latent variables). This confirmatory factor analysis allowed the authors to

quantitatively test their theoretical model (Pintrich et al., 1993). The results indicated that the MSLQ showed reasonable factor validity

Following the factor analyses, the authors calculated internal consistency estimates of reliability (Cronbach's alpha) and "zero-order correlations between the different motivational and learning strategy scales" (Pintrich et al., 1993, p. 806). The majority of the Cronbach's alphas for the individual scales (9 out of 15) were fairly robust (i.e., they were greater than 0.70, with the largest one, self-efficacy for learning and performance, being 0.93). Overall, these results suggested the MSLQ had relatively good internal reliability.

As for the zero-order correlations between the different scales, they too were fairly robust and suggested that the scales were valid measures of the motivational and cognitive and metacognitive constructs (Pintrich et al., 1993).

To determine predictive validity, the motivated strategy for learning questionnaire (MSLQ) sub-scales was correlated with university students' final course grades. As described by the authors, "the scale correlations with final grade are significant, albeit moderate, demonstrating predictive validity" (Pintrich et al., 1993, p. 7). Additionally, all correlations were in the expected direction, further adding to the validity of the scales. Taken as a whole, the sub-scales seemed to show sound predictive validity.

The reliability of the questionnaire was further assessed in this study through a pilot test. To ensure that the students understood well the elements in the questionnaire, the questionnaire was pre-tested on some form 5 and upper sixth students of GBHS EtougEgbe. These students had the same characteristics as the population of the study but were not included in the study. The responses were examined and compared to see if the students have a complete understanding of the content of the questionnaire. Students were given an opportunity to ask questions where they were unclear and notes were taken on where they found difficulties in understanding the questions and revisions made accordingly.

## 3.7. DATA COLLECTION PROCEDURE

To collect data for this research, the researcher sought permission from the administration of the various schools that were involved in the research. After permission was granted, the researcher was given a day and time to come and administer the questionnaire.

Regarding the procedure that was used to collect data in G.H.S Mankon, the researcher was assisted by one of the teachers in the school. The teacher took the researcher to

the respective form five and upper sixth classes during regular class time on a Wednesday and informed the teacher about the study to be carried out. The teacher then went on to introduce the researcher. The researcher talked to the students about the study, solicited their participation and assured them that their information will be kept confidential. The questionnaires were then distributed and the researcher waited for the students to finish them for collection.

In P.S.S Mankon, a similar procedure was carried out. However, instead of the students filling the questionnaire during regular class periods, it was completed during their afternoon study period on Sunday.

## 3.8. THE METHODS OF DATA ANALYSIS

Data analysis was conducted using the R Project for Statistical Computing – Version 3.3.0 as well as the Data Analysis Tool Pack in Excel.

Data collected from the field was subjected to both descriptive and inferential statistics. For descriptive statistics, frequencies, and percentages were used to describe the data collected. These were presented in the form of tables, bar charts, multi box plots and pie charts.

For inferential statistics, Pearson's correlation coefficient and the ANOVA (average of variances) were used to verify the research hypotheses.

As regards the method of hypothesis testing using Pearson's correlation coefficient, several steps were used. The first step consisted of announcing the hypothesis followed by determining the degree of freedom (n-2) and the level of significance. The calculation of the correlation coefficient (Rcal) then followed. The critical value for the correlation coefficient (Rcrit), which is read from an r –table and that correspond to the obtained degree of freedom and the level of significance, is then compared with the calculated value. Finally a conclusion is then made. If the Rcal is greater than Rcrit then the null hypothesis will be rejected at that particular level of significance and the alternative hypothesis accepted. If the reverse is true, then the alternative hypothesis is rejected and the null hypothesis retained.

For the testing of the hypothesis that some self-regulated learning strategies have a greater significant relationship with the academic performance of students, the p values for each of the correlation coefficients for the other three hypotheses were calculated and

compared. Where a difference was observed, the hypothesis will be confirmed and if no difference is observed then it will be rejected.

ANOVA was used to test if there was a significant difference in the students' use of the three different self-regulated learning strategies. The extent to which the students' use the strategies were then ranked and plotted.

# CHAPTER FOUR

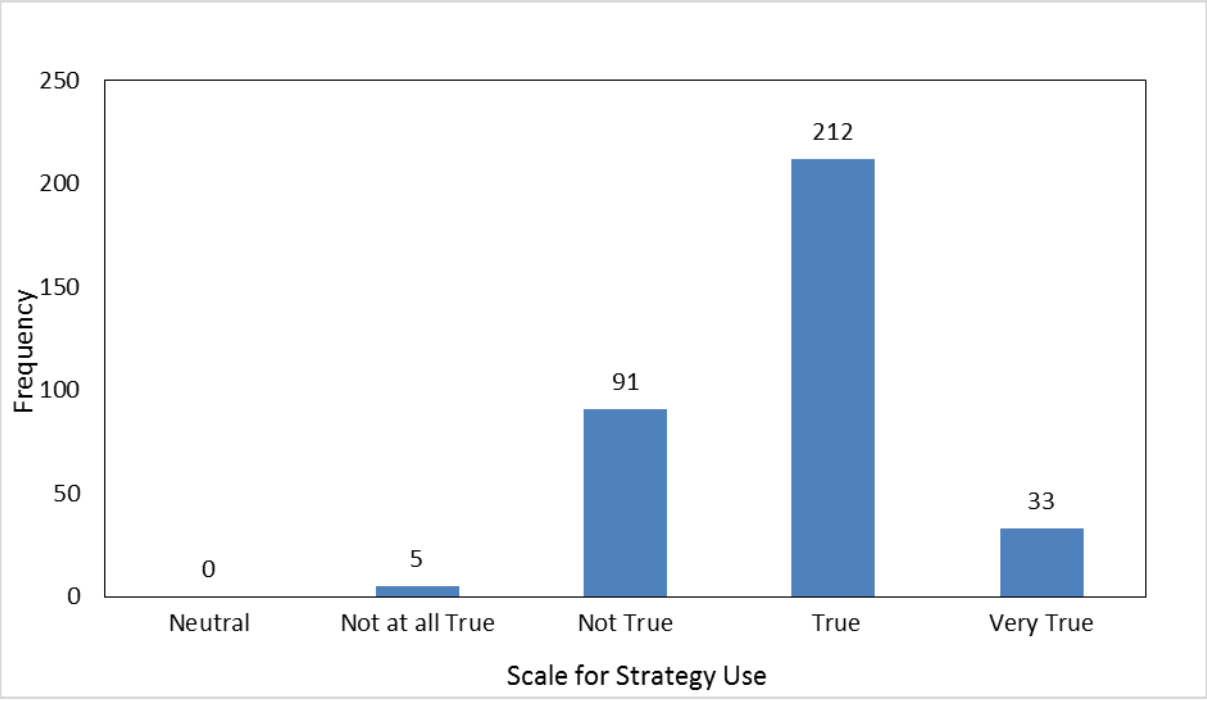
# PRESENTATION AND ANALYSIS OF RESULTS

## 4.0. INTRODUCTION

This chapter presents the results of the data collected from the research participants through the use of the questionnaire constructed in relation to the research variables and equally analyses the data collected with respect to the formulated research hypothesis. The results describing the data collected is represented by using frequencies, and percentages, and presented in the form of tables, pie charts, multi box plots and bar charts.

## 4.1 Students' Use of Cognitive Learning Strategies

**Figure 4.1: Frequency Distribution of students' use of cognitive learning strategies**

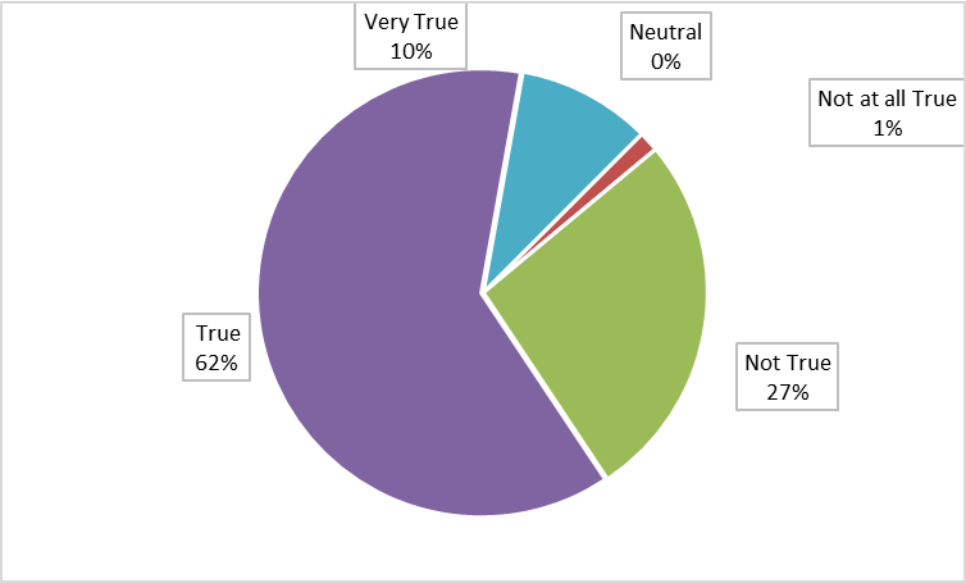



***Source: Constituted by researcher from field data***

Figure 4.1 shows that 33 of the students that participated in the research rated the statements on the use of cognitive strategy as very true, 212 ranked them as true, 91 as untrue and only 5 as very untrue. Globally, 245 (212 +33) of the students admitted using cognitive

learning strategies during their personal studies, while 96 (91 +5) denied that they make use of cognitive learning strategies when they study.

**Figure 4.2: Percentage distribution of students according to their use of cognitive learning strategies**

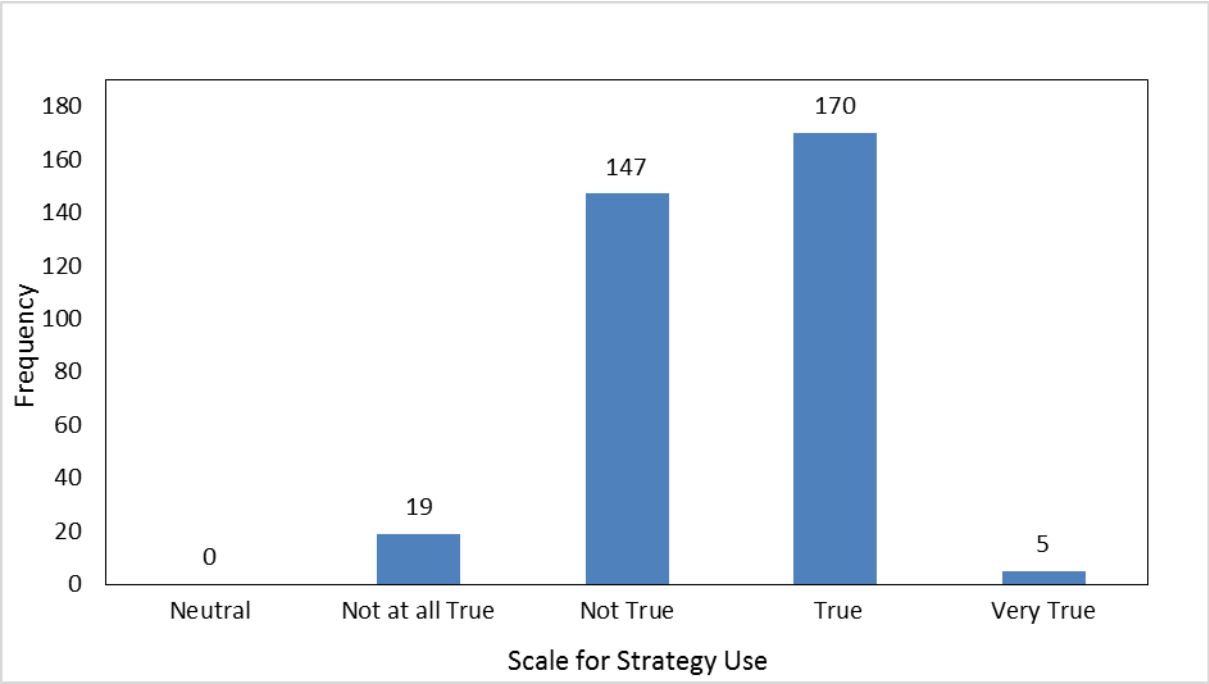



***Source: Constituted by researcher from field data***

Figure 4.2 indicates that 72% of the students use cognitive learning strategies when they engage in personal studies (62% for true + 10% for very true), while 28% of students do not use cognitive learning strategies when studying (27 % for not true and 1 % for not at all true).

### 4.2 Students' Use of Metacognitive Learning Strategies

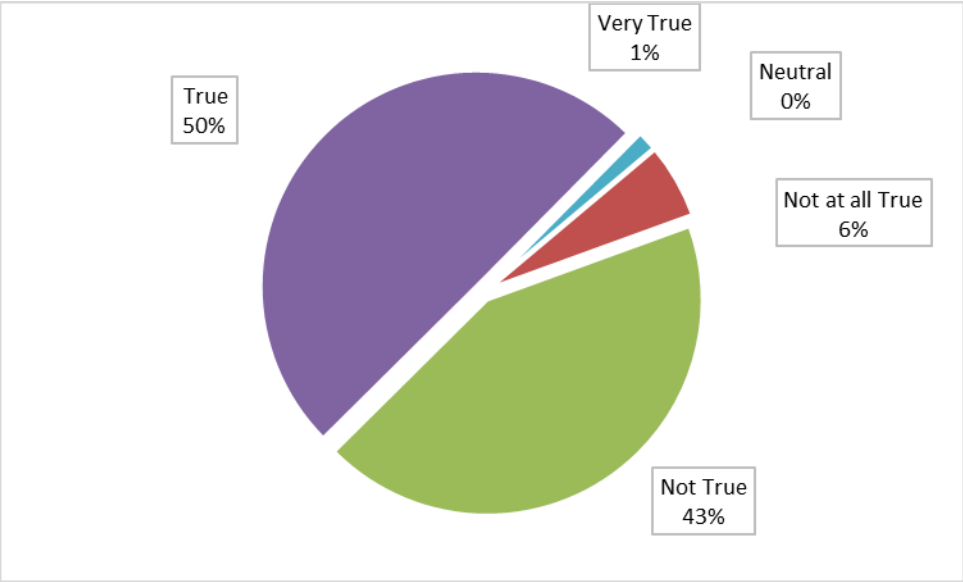
**Figure 4.3: Frequency Distribution of Students' Use of Metacognitive Learning Strategies**




***Source: Constituted by researcher from field data***

Figure 4.3 shows that 175 students (170 for true + 5 for very true) use metacognitive learning strategies when they study. 166 of the students (147 for not true + 19 for not at all true) denied employing these strategies during their personal studies.

**Figure 4.4: Percentage distribution of students according to their use of metacognitive learning strategies**

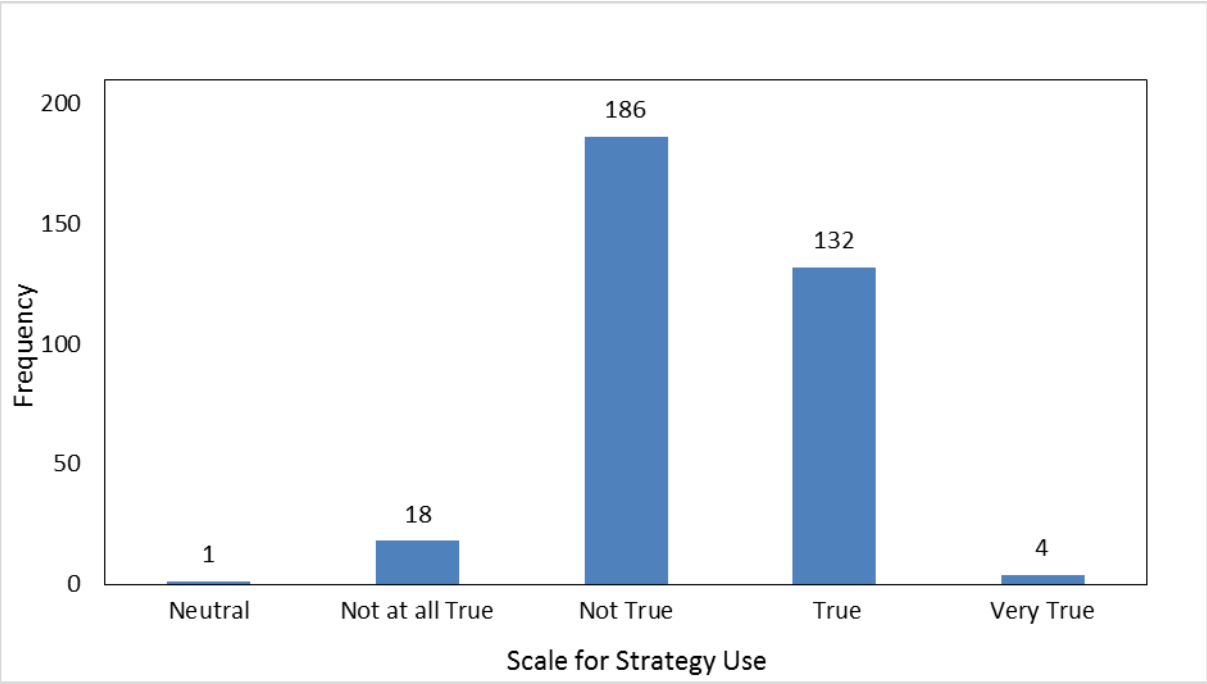



***Source: Constituted by researcher from field data***

Figure 4.4 shows that about half of the students: 51% (50% for true and 1% for very true) used metacognitive learning strategies while the remaining 49% of students did not use them. Also, only 1% of the students that used these strategies rated their responses as "very true". This an indication that students who used them these strategies did not use them all the time.

### 4.3.Students' Use of Time and Study Environment Management Learning Strategies

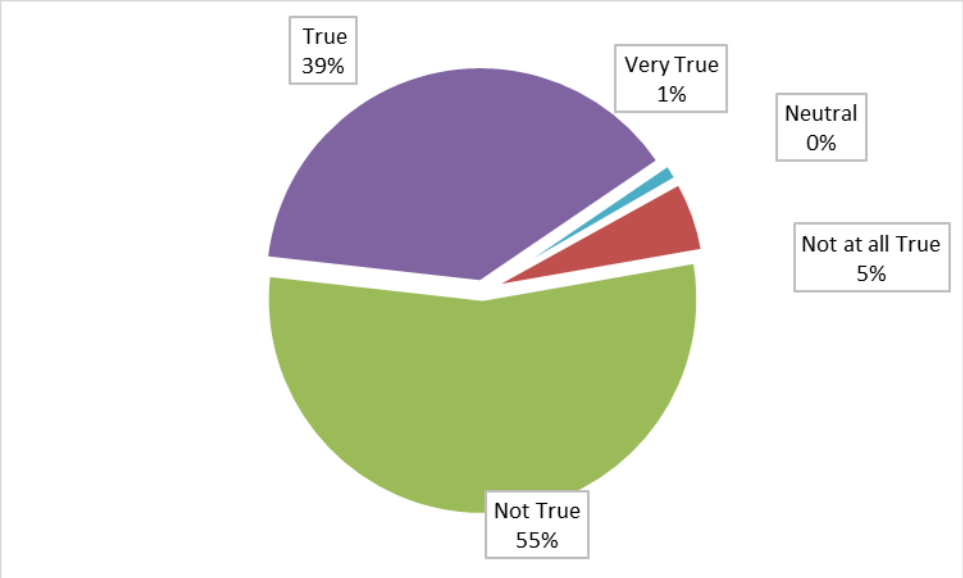
**Figure 4.5: Frequency Distribution of Students' Use of Time and Study Environment management learning Strategies**




***Source: Constituted by researcher from field data***

Figure 4.5 shows that most of the students (204 students = 186 for not true + 18 for not at all true) did not use learning strategies that enhanced their management of time and their study environment. 136 of the students that took part in this research (132 for true +4 for very true) used strategies that help them manage their time and study environment.

**Figure 4.6: Percentage distribution of students according to their use of time and study environment management learning strategies**




***Source: Constituted by researcher from field data***

Figure 4.6 shows that 60% of the students (55% for not true and 5% for not at all true) do not use learning strategies that help them to manage their time and study environment and 40% of the students (39 for true and 1 for very true) use these strategies.

### 4.4 The Academic Performance of the Students that Participated in the Research

**Table 4.1: Frequency Distribution of Students according to Average Mark for the First and Second Terms**

| **Average Mark for first and second Term** | **Frequency of Form Five students** | **Frequency of upper sixth students** | **Total** |
|---|---|---|---|
| [0-5[ | 13 | 6 | 19 |
| [5-10[ | 101 | 107 | 208 |
| [10-15[ | 69 | 44 | 113 |
| [15-20] | 1 | 0 | 1 |
| Total | 184 | 157 | 341 |

***Source: Constituted by researcher from field data***

Table 4.1 shows the frequency distribution of students according to their average marks obtained for the first and second terms. From the table, it is observed that a majority of the students (208) had their average mark within the range 5-10, followed by the range 10-15 with 113 students. Only 1 student had an average mark above 15 and 19 of the remaining students had their average mark ranging below 5.

**Table 4.2: Percentage Distribution of Students' according to Average Mark for the First and Second Terms**

| **Average Mark for first and second Term** | **Total Frequency of students** | **Percentage of students** |
|---|---|---|
| [0-5[ | 19 | 5.6%% |
| [5-10[ | 208 | 61% |
| [10-15[ | 113 | 33.1% |
| [15-20] | 1 | 0.3% |
| Total | 341 | 100% |

***Source: Constituted by researcher from field data***

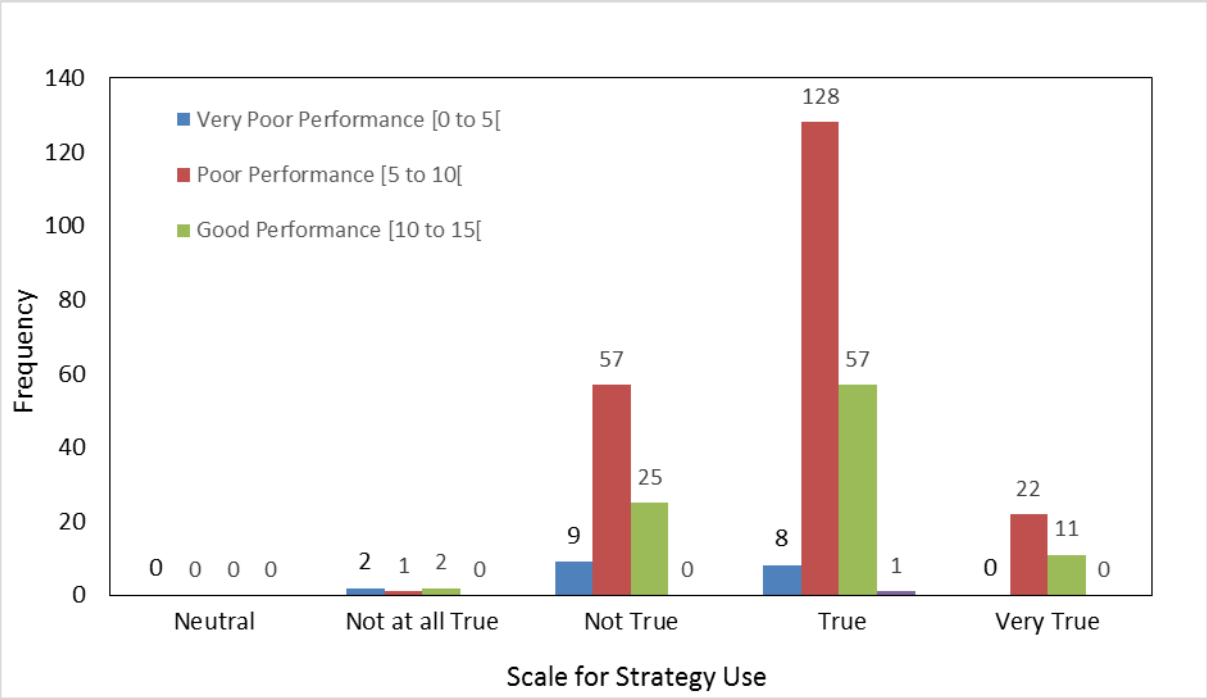
Table 4.2 shows that 61% of the students who participated in this research had their average mark for first and second term within the range 5-10. The lowest proportion of students (0.3%) had their average mark within the range 15-20. The remaining 36.7% of students had their marks within the range 0-5 and 10-15.

### 4.5. Students' Use of Learning Strategies and Academic Performance

This section will describe the impact that students' use or non-use of each type of learning strategy has on their academic performance.

### 4.5.1 Cognitive Learning Strategies and Academic Achievement

**Figure 4.7: Frequency Distribution of students according to their use of Cognitive learning Strategies and their academic performance**




***Source: Constituted by researcher from field data***

Figure 4.7 shows that for the students that use cognitive learning strategies (those who selected true and very true) a majority of them (150 students obtained by summing 128 for true +22 for very true) still have a poor academic performance. A smaller number of these students who use cognitive learning strategies (68, obtained by summing 57 for true and 11 for very true) have a good academic performance. However, only 8 of the students that used these strategies have a very poor performance.

Also, for the students that denied using cognitive learning strategies (those who selected untrue and very untrue), most of them had a poor academic performance (58). 27 of these students still ended up having a good academic performance while only 11 had a very poor academic performance.

| **Table 4.3 Percentage Distribution of students according to their Use of Cognitive learning Strategies and academic performance** | | |
|---|---|---|
| Average mark on 20 for first and second terms | Frequency of students who use cognitive learning strategies | Percentage of students who use cognitive learning strategies |
| [0-5[ | 8 | 5% |
| [5-10[ | 150 | 65% |
| [10-15[ | 68 | 30% |
| Total | 226 | 100% |
| ***Source: Constituted by researcher from field data*** | | |

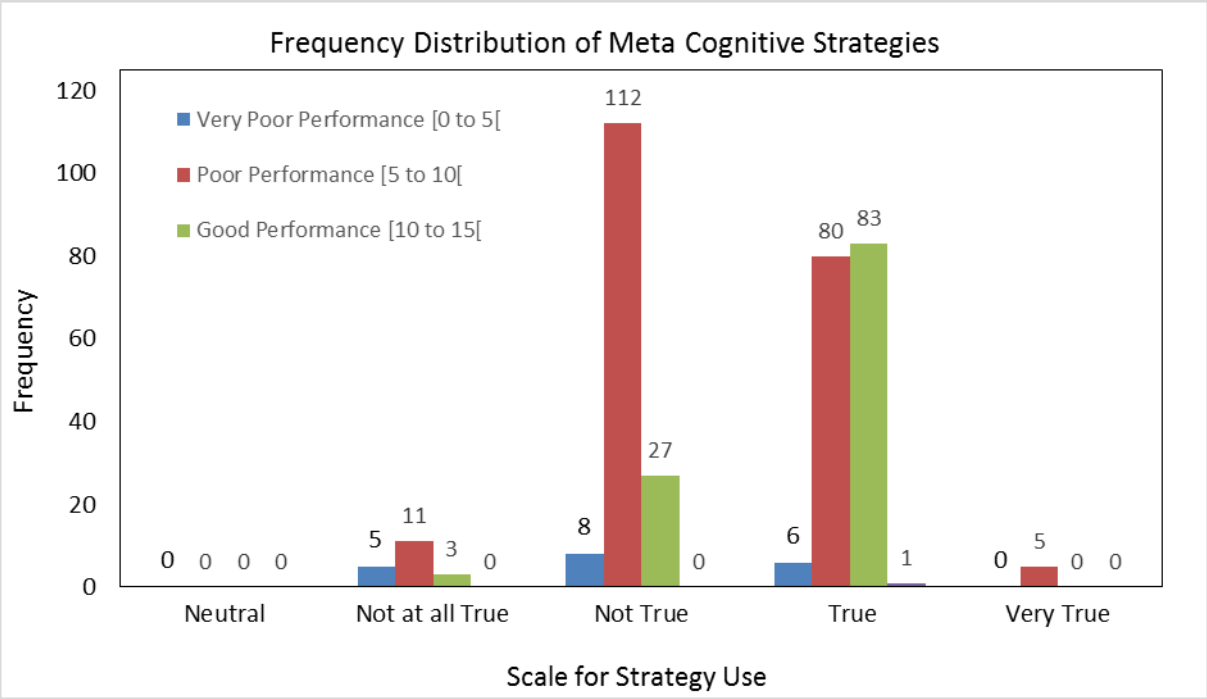
Table 4.3 above shows that 65% of students who use cognitive learning strategies had a poor academic performance and 5% a very poor academic performance. However, 30% of the students that use cognitive learning strategies have a good academic performance.

| **Table 4.4 Percentage Distribution of students according to their non-use of Cognitive learning Strategies and academic performance** | | |
|---|---|---|
| Average mark on 20 for first and second terms | Frequency of students who use cognitive learning strategies | Percentage of students who use cognitive learning strategies |
| [0-5[ | 11 | 12% |
| [5-10[ | 58 | 60% |
| [10-15[ | 27 | 28% |
| Total | 96 | 100% |
| ***Source: Constituted by researcher from field data*** | | |

It is observed that 60% of the students that do not use cognitive learning strategies have their average mark for first and second term ranging from 5-10, 28% of the students have their marks ranging from 10-15 and 12% have their marks ranging from 0-5 (Table 4.4).

### 4.5.2 Metacognitive Learning Strategies and Academic Performance of students

**Figure 4.8: Frequency Distribution of students according to their Use of Metacognitive learning Strategies and their academic performance**




***Source: Constituted by researcher from field data***

Figure 4.8 shows that for the students that use metacognitive learning strategies (those who selected true and very true) 83 of them have their average mark ranging from 10-15, 85 of the students have their average mark ranging from 5-10 and only 6 of the students have average mark ranging from 0-5.

Also, for the students that denied using metacognitive learning strategies (those who selected untrue and very untrue), most of them had a poor academic performance. 123 of these students had an average mark ranging from 5-10, and 12 of them had an average mark ranging from 0-5. Only 30 of the students that denied using metacognitive learning strategies had their average marks above 10.

| **Table 4.5. Percentage Distribution of students according to their Use of Metacognitive learning Strategies and academic performance** | | |
|---|---|---|
| Average mark on 20 for first and second term | Frequency of students who use cognitive learning strategies | Percentage of students who use cognitive learning strategies |
| [0-5[ | 6 | 3% |
| [5-10[ | 85 | 49% |
| [10-15[ | 83 | 48% |
| Total | 174 | 100% |
| ***Source: Constituted by researcher from field data*** | | |

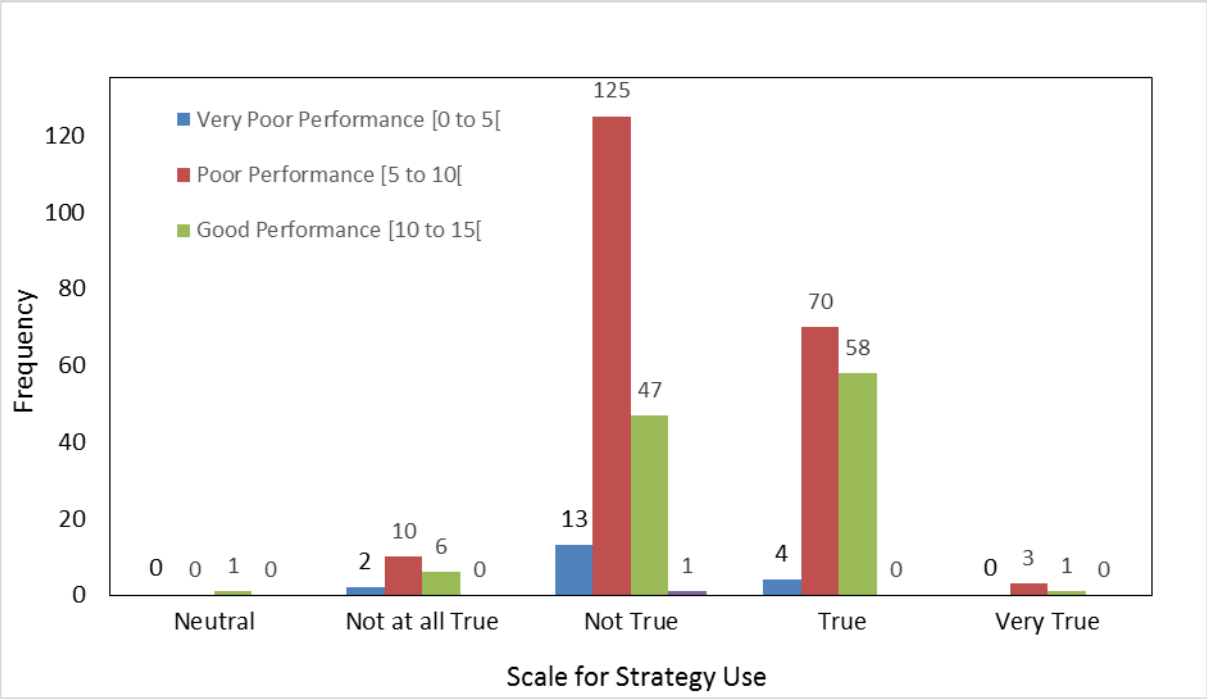
Table 4.5 shows that 48% of students who use metacognitive learning strategies had their average mark ranging from 10-15, 49% had their average mark ranging from 5-10 and only 3% had their average mark below 5.

| **Table 4.6. Percentage Distribution of students according to their non-use of metacognitive learning Strategies and academic performance** | | |
|---|---|---|
| Average mark on 20 for first and second terms | Frequency of students who do not use metacognitive learning strategies | Percentage of students who do not use metacognitive learning strategies |
| [0-5[ | 12 | 7% |
| [5-10[ | 123 | 75% |
| [10-15[ | 30 | 18% |
| Total | 96 | 100% |
| ***Source: Constituted by researcher from field data*** | | |

From table 4.6, it is observed that 75% of the students that do not use cognitive learning strategies have their average mark for first and second terms ranging from 5-10, 30% of the students have their marks ranging from 10-15 and 7% have their marks ranging from 0-5.

### 4.5.3 Time and Study Environment management Learning Strategies and Academic Performance of students

**Figure 4.9: Frequency Distribution of students according to their Use of time and study environment management learning Strategies and their academic performance**




***Source: Constituted by researcher from field data***

Figure 4.9 shows that for the students that use learning strategies that enhance their management of time and study environment (those who selected true and very true), 59 0f them have their average mark ranging from 10-15, 73 of the students have their average mark ranging from 5-10 and only 4 of the students have average mark ranging from 0-5.

Also, for the students that denied using time and study environment management learning strategies (those who selected untrue and very untrue), most of them had a poor academic performance. 135 of these students had an average mark ranging from 5-10, 54 of these students had their marks ranging from 10-15 and 16 of them had their marks ranging from 0-5.

| **Table 4.7. Percentage Distribution of students according to their Use of learning strategies that help them manage their time and study environment** | | |
|---|---|---|
| Average mark on 20 for first and second terms | Frequency of students who use time and study environment management learning strategies | Percentage of students who use time and study environment management learning strategies |
| [0-5[ | 4 | 3% |
| [5-10[ | 73 | 54% |
| [10-15[ | 59 | 43% |
| Total | 136 | 100% |
| ***Source: Constituted by researcher from field data*** | | |

Table 4.7 shows that 54% of students who use time and study environment management learning strategies had their average mark ranging from 5-10, 43% had their average mark ranging from 10-15 and only 3% had their average mark below 5.

| **Table 4.8. Percentage Distribution of students according to their non-use of time and study environment management learning Strategies and academic performance** | | |
|---|---|---|
| Average mark on 20 for first and second terms | Frequency of students who do not use time and study environment management learning strategies | Percentage of students who do not use time and study environment management learning strategies |
| [0-5[ | 16 | 8% |
| [5-10[ | 135 | 66% |
| [10-15[ | 54 | 26% |
| Total | 205 | 100% |
| ***Source: Constituted by researcher from field data*** | | |

From table 4.8, it is observed that 66% of the students that do not use time and study environment learning strategy have their average mark for first and second term ranging from 5-10, 26% of the students have their marks ranging from 10-15 and 8% have their average marks below 5.

## 4.6. VERIFICATION OF HYPOTHESES

In this section, the research hypothesis is going to be verified. As a statistical tool, the Pearson correlation coefficient will be used to test the research hypotheses. The statistical processing of the data was done through the excel software as shown in the tables below.

**Table 4.9: Correlation matrix**

| Mean Scores | Cognitive learningstrategies | Metacognitivelearningstrategies | Time and study environment managament leaning strategies | Average Down |
|---|---|---|---|---|
| Cognitive learningstrategies | 1 | | | |
| Metacognitivelearningstrategies | 0.324053 | 1 | | |
| Time and study environment management leaning strategies | 0.386086 | 0.4485 | 1 | |
| Correlation coefficient (r) | 0.144738 | 0.317687 | 0.175825 | 1 |
| Calculated p value | 0.007495 | 1.93E-09 | 0.001129 | |
| Level of significance | ** | *** | ** | |
| Critical p value | 0.01 | 0.005 | 0.01 | |

**HYPOTHESIS 1**

**Nullhypothesis (Ho):**

There is no significant relationship between secondary school students' use of cognitive learning strategies and their academic performance.

**Alternative Hypothesis (Ha):**

There is a significant relationship between secondary school students' use of cognitive learning strategies and their academic performance.

The null hypothesis was tested at a 0.05 (5%) level of significance, and degree of freedom (*df*) of n-2 = 339, using a two tailed test.

Using the calculated correlation coefficient of 0.144738 obtained for the correlation that exist between the use of cognitive learning strategies and academic performance of students as shown on Table 4.9 above, the p value read on the PEARSON'S CORRELATION COEFFICIENT (r) table of critical values (see annexes) is 0.01(Critical Values). The calculated p value was 0.007495.

Since the p values obtained are less than 0.05; the level of significance against which the research hypothesis is being tested, the null hypothesis is rejected and the alternative hypothesis retained. As such, we conclude that: there is a significant relationship between the use of cognitive learning strategies and the academic performance of students.

**HYPOTHESIS 2**

**Null hypothesis (Ho):**

There is no significant relationship between secondary school students' use of metacognitive learning strategies and their academic performance.

**Alternative Hypothesis (Ha):**

There is a significant relationship between secondary school students' use of metacognitive learning strategies and their academic performance.

Again, the null hypothesis will be tested at a 0.05 (5%) level of significance, and degree of freedom (*df*) of n-2 = 339, using a two tailed test.

With the calculated correlation coefficient of 0.317687 obtained for the correlation that exist between the use of metacognitive learning strategies and academic performance of students as shown on table 4.9 above, the p value read on the PEARSON'S CORRELATION COEFFICIENT (r) table of critical values (see annexes) is 0.000 (Critical Values). The calculated p value was 1.93E-09.

Since the p values obtained are less than 0.05; the level of significance against which the research hypothesis is being tested, the null hypothesis is rejected and the alternative hypothesis retained. As such, we conclude that: there is a significant relationship between the use of metacognitive learning strategies and the academic performance of students.

**HYPOTHESIS 3**

**Null hypothesis (Ho):**

There is no significant relationship between secondary school students' use of time and study environment management learning strategies and their academic performance.

**Alternative Hypothesis (Ha):**

There is a significant relationship between secondary school students' use of time and study environment management learning strategies and their academic performance.

The null hypothesis will be tested at a 0.05 (5%) level of significance, and degree of freedom (*df*) of n-2 = 339, using a two tailed test.

By means of the calculated correlation coefficient of 0.175825 obtained for the correlation that exist between the use of time and study environment management learning strategies and academic performance of students as shown on table 4.9 above, the p value read on the PEARSON'S CORRELATION COEFFICIENT (r) table of critical values (see annexes) is 0.01(Critical Values). The calculated p value was 0.001129.

Since the p values obtained are less than 0.05; the level of significance against which the research hypothesis is being tested, the null hypothesis is rejected and the alternative hypothesis retained. As such, we conclude that: there is a significant relationship between the

use of time and study environment management learning strategies and the academic performance of students.

**HYPOTHESIS 4**

**Null hypothesis (Ho):**

The relationship between the use of learning strategies and the academic performance of secondary school students is the same for all three types of learning strategies

**Alternative Hypothesis (Ha):**

Some learning strategies have a greater significant relationship on the academic performance of secondary school students than others.

To test this null hypothesis, the calculated p values for the different correlation coefficients for the use of respective learning strategies and performance were compared. A significant difference in these p values signifies that the influence exerted by some learning strategies on performance is stronger than others.

**Table 4.10: P Values of the Various Learning Strategies**

| P values | Cognitive learningstrategies | Metacognitivelearningstrategies | Time and study environment management leaning strategies |
|---|---|---|---|
| Calculated p value | 0.007495 | 1.93E-09 | 0.001129 |
| Critical p values | 0.01 | 0.005 | 0.01 |
| Level of significance | ** | *** | ** |

***Source: Constituted by researcher from field data***

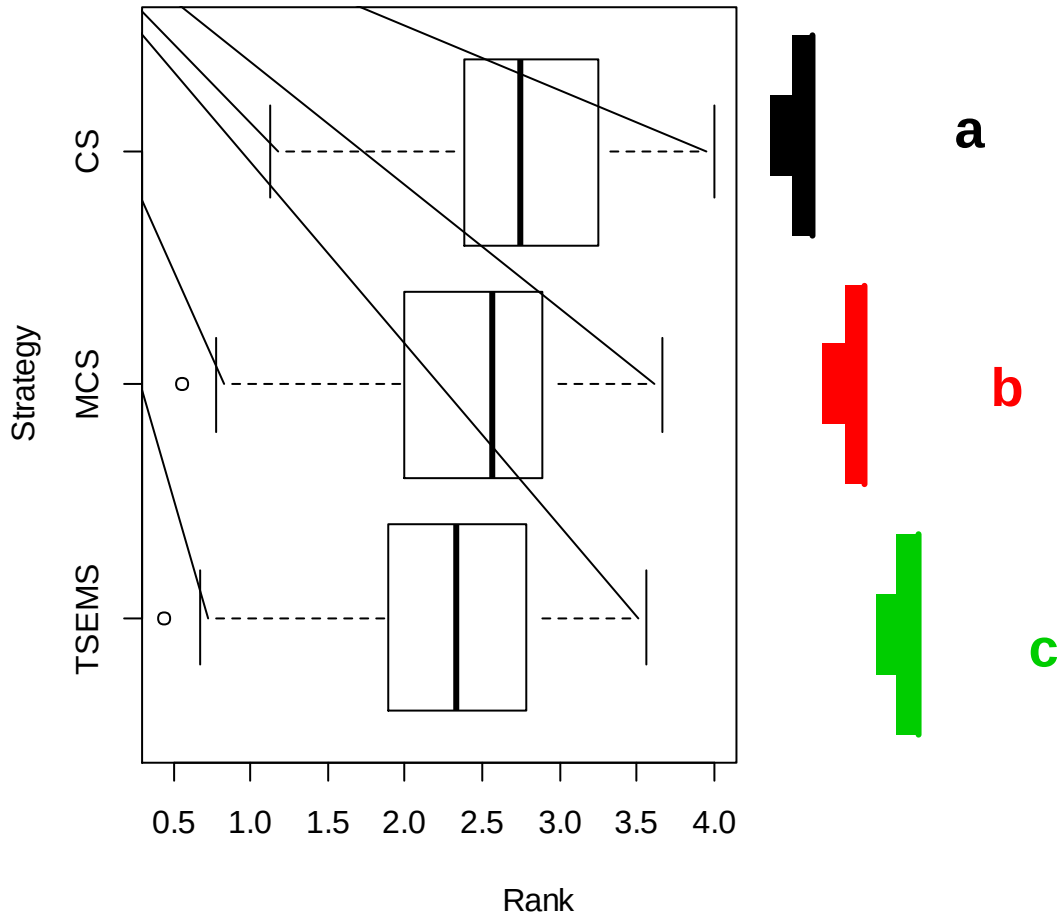
Table 4.10 shows that the various learning strategies have different calculated p values. The calculated p value for cognitive learning strategies is 0.007495, the calculated p

value for the use of metacognitive learning strategies is 1.93E-09 and the calculated p value for the use of time and study environment management learning strategy is 0.001129. This shows that the use of the different learning strategies have different levels of significance with the academic performance of students.

Comparing also the critical p values of the different learning strategies, we observe that cognitive and time and study environment management learning strategies have the same critical values of 0.01. This implies that, if the research hypothesis were tested at a 1% level of significance, then it would have been rejected for the use of these two learning strategies. On the contrary, the critical p value for the use of metacognitive learning strategy is 0.005. This means that, testing the research hypothesis for the use of this strategy at a 1% level of significance, one will still conclude on a significant relationship between its use and the academic performance of students.

An ANOVA test was conducted to ascertain if there was a significance difference between the students' use of the three learning strategies. Results indicated that there was a strong significant difference in their use of the learning three strategies ($p < 0.05$). It was necessary to confirm that there was an also significant difference between all possible pairs of learning strategies. This was achieved using a multiple comparison pair wise. t. test. It indeed confirmed that no two strategies were used to the same extend by the students (p-values from all pairs $< 0.05$). This left the question as to which strategy was used the most or the least. The ranking is presented using a multi-comparison box plot in Figure 4.10 indicating that the students used cognitive strategy the most, and time and environmental management strategy the least.

**Figure 4.10: Multi-comparison box plot that ranks the students use of learning strategies**




Judging from the above analysis, it can be concluded that the use of metacognitive learning strategies have a higher level of significance on the academic performance of secondary school students than the use of cognitive as well as time and study environment management strategies. This is represented by the level of significance shown in Table 4.10 and predicted the multi comparison box plot in Figure 4.10.

# CHAPTER FIVE

# DISCUSSION OF FINDINGS, RECOMMENDATIONS AND CONCLUSION

## 5.0 INTRODUCTION

This chapter focuses on discussing the findings that were obtained in this research, based on the formulated research hypotheses and previous research on the topic, recommendations aimed to improve secondary school students' academic performance and ends with a general conclusion on the study while highlighting the limits of the study.

## 5.1 DISCUSSION OF FINDINGS

The main purpose of this study was to investigate whether the use of self-regulated learning strategies significantly influenced the academic performance of secondary school students in Cameroon in general, particularly upper sixth and form five students of two schools: P.S.S and G.H.S Mankon, in the North West Region of Cameroon. To this end, four research hypothesis where formulated as follows:

- There exist a significant relationship between the use of cognitive learning strategies and the academic performance of secondary school students
- There exist a significant relationship between the use of metacognitive strategies and the academic performance of secondary school students.
- There exist a significant relationship between the use of resource management learning strategies and secondary school students; academic performance.
- Some learning strategies have a greater significant relationship on the academic performance of secondary school students than others

The findings of this research reveal that the dependent variable: academic performance of students in this study was generally poor. Some 64.6% of the students that participated in this study had their average mark for both first term and second term of the current school year falling below 10/20. Only 33.4% of the students had an academic performance of above 10/20. This is in line with the MINESEC G.C.E Annual statistics in Table 1.1 of this study that show a poor academic performance of students at the secondary school level.

Statistical analysis using Pearson's correlation coefficient reveal a significant relationship between the use of cognitive self-regulated learning strategies and academic performance with a critical p value of 0.01. These results agree with the findings of Marzieh (2010)that the use cognitive self-regulated learning strategies have a significant influence on the academic performance of students and depart from the findings of Sadi&Uyar (2012) that the use of cognitive self-regulated learning strategies had no relationship with the academic performance of students.

These findings support the view of Cosnefroy, (2011) that deep information processing helps in easily retrieving it. This is why students who use cognitive strategies like elaboration and organisation should be able to retain what they learn better and thus equally recall and apply it during examinations resulting to a good academic performance.

Comparing the academic performance of the students in this study with their use of cognitive strategies, it was realised that most of these students (72%) were using cognitive learning strategies. However, from Table 4.5, 70% of the students who use cognitive learning strategies have a poor performance. This may be an indication that even though the students admit using these strategies, they may be limited to those that enhance only shallow processing of information rather than those that enhance deep processing of information. Craik and Lockhart, (1972) state that when students limit themselves to learning strategies like rehearsal and memorisation, they only shallowly process the information they are learning. As such, when the time comes for them to apply this information during exams, they are unable to do so and a situation of failure like what is being observed by most students in this study will be experienced.

As concerns whether the use of metacognitive learning strategies had a significant relationship with the academic performance of secondary school students, statistical analysis using Pearson's correlation coefficient reveal that there exist a significant relationship between the two variables with critical p of 0.005. This finding ties with much of the literature on the use of metacognitive learning strategies and academic performance such as Somaye&Shahla (2016),Hassan & Ahmed (2015) and Khatib (2010).

These findings are in line with Piaget's cognitive theory that states that learning is an active process. Students who use metacognitive learning strategies constantly question their thoughts and Piaget postulates that this helps the accommodation and assimilation of knowledge. This explains their superior academic performance as compared to those who do not engage in the use of these strategies.

These findings also support Flavell's (1976) view that students who are metacognitively engaged in their learning consider and take active control of the processes involved in learning and thinking as they are happening. This control enables them to look for the learning gaps that they have, fill them and this result in a better academic performance.

Regarding the hypothesis that the use of time and study environment management learning strategies has a significant influence on the academic performance of students, the statistical analysis computed between the two variables using Pearson's correlation coefficient reveal that there exist a significant relationship between the two variables with critical p of 0.01.

The above findings are in line with the results of Purdie & Hattie (1996) who concluded that students who make efforts to arrange or control their surroundings to make completing a learning task more likely to occur without interruption are likely to learn more effectively and achieve a good academic performance. This is also in line withZimmerman & Martinez (1986) who found out those students who choose a study environment that is free of distractions so they can concentrate, or restructure the physical environment to be more conducive when preparing for exams end up achieving higher scores than students who make no changes to their study environment.

This finding also ties with the conclusion made by Delucchi et al (1987) that, academic achievement depends not on the total time studying but on effective time management and along with other self-management skills. Students may really desire to accomplish their academic goals but do not know how to structure their efforts in order to plan and carryout these goals. Effort regulation is not simply a reflection of a student's desire to accomplish a task, but a self-management strategy that consist of incorporating other resource management strategies such as study environment and time management.

The fact that all three learning strategies show a significant relationship with academic performance support the view of Zimmerman (1979) that learning requires the engagement of the learner. Effective learning can only occur when students adopt behaviours like the use of learning strategies to enhance their learning. Where such engagement is lacking students are bound to fail.

Concerning the research hypothesis that some self-regulated learning strategies have a greater significant influence on the academic performance of students than others, metacognitive self-regulated learning strategies in this study showed the greatest significant

relationship with performance (p=0.005) while cognitive and time and study environment management strategies stood at the same level of significance (p=0.01 for each). This results are in line with the findings of Marzieh (2010) who concluded that the use of metacognitive learning strategies predict academic performance of students more accurately than cognitive strategies.

The results of this study also reveal that the proportion of students that were currently employing metacognitive learning strategies in their learning is just about halve (51%). Most of the students rely on the use of cognitive learning strategies (72%) while neglecting the use of metacognitive learning strategies. Seeing that the use of metacognitive learning strategies has a more significant relationship to academic performance than cognitive learning strategies, their non-use of these strategies can explain the reason why the still have a poor academic performance.

## 5.2 RECOMMENDATIONS

Following the findings of this research, the following recommendations to students, teachers, guidance counsellors, the state and other researchers have been made:

**For secondary school students**, they should make use of learning strategies while they study. More importantly, they should never neglect the use of metacognitive learning strategies that help them to understand the way they are learning. These strategies will help them to know what they are expected to learn, what they actually know, what they do not know and therefore help them focus their efforts more towards attaining a good academic performance.

**To teachers**, it should be understood that children practice and understand more what they have had the opportunity to see and experience. As such, they should incorporate various learning strategies in their teaching methods with particular emphasis on metacognitive learning strategies. They should equally teach these students some strategies that enhance independent studies.

**To guidance counsellors** to whom students always run to for help in studying, they should find out the learning strategies that these students are employing, how they are employing them and then provide advice to fill the gaps in their use. Emphasis should be laid on the use of metacognitive learning strategies. Also, during their information session on

study techniques, they should encourage students to use many learning strategies and emphasize on the importance of the use of metacognitive learning strategies

**To the state**, it is recommended that student teachers should be taught on how can effectively incorporate the teaching of learning strategies especially the metacognitive strategies in their teaching.

Guidance counsellors who are charged with the counselling of these students should be taught this topic during their training as well because they will face the challenge of meeting students' needs in this domain.

The state should also increase the number of guidance counsellors being trained to ensure that students in all secondary schools in Cameroon (both public and private) have at least one guidance counsellor to meet students' learning needs.

**As regards recommendations for future studies,**

- Research should be carried out with respect to the relationship between the use of learning strategies and performance in specific domains. This research was focused on general academic performance. Focusing on specific subject areas may give different results and provide additional information in this respect.
- Also, research should be carried out to access the impact of gender on the use of learning strategies. This will explain if the gap in the academic performance of boys and girls can be explained by the learning strategies they use. This will go a long way to provide help in bridging the performance gap between the different sexes.
- Further study on this topic should be carried out with a qualitative methodology. Such a methodology will help to explain exactly how students use learning strategies and then those that are more associated to performance could be encouraged
- The effect of learning strategies and other variables on performance should be studied so that the performance of students will be enhanced.

## CONCLUSION

This research on the self-regulated learning strategies of secondary school students and academic performance of secondary school students was born from the observation that students at this level make use of learning strategies aimed at regulating their learning but still end up performing poorly. It had as aim to establish whether the use of self-regulated learning

strategies by secondary school students had a significant relationship with the academic performance. To this end, this research investigated the main strategies that these students were employing. Four research hypothesis where formulated: there exist a significant relationship with the use of cognitive learning strategies and the academic performance of students; there exist a significant relationship with the use of metacognitive learning strategies and the academic performance of secondary school students; there exist a significant relationship with the use of time and environmental management learning strategies and the academic performance of secondary school students and lastly, some learning strategies have a greater significant relationship on the academic performance of secondary school students than others. The findings obtained reveal that these students mainly use cognitive learning strategies (70% of them) and also all the hypotheses of the study were confirmed after carrying out statistical computation with the Pearson's correlation coefficient. The comparison between the use of cognitive learning strategies and academic performance obtained a p value of 0.01, metacognitive learning strategies p value 0f 0.005 and time and study environment management a p value of 0.01. The use of metacognitive learning strategies showed a more significant association with academic performance than any of the other two variables with a p value of 0.005 as opposed to 0.01 for each of the other two learning strategies.

## REFRENCES


Abbott, J., (1994). Learning makes sense: recreating education for a changing future. Letchworth, Hertfordshire.

Alexander, P. A., Graham, S., & Harris, K. R. (1998). "A perspective on strategy research: Progress and prospects", Educational Psychology Review, 10, 129-154

Alikhani, S; Markazi, M; Broumand, S; Zand, B and Mitra (2005). 'Studying the effective factors on students' academic failure between the years of 2001- 2004 in army medical science university", Research and scientific magazine of army medical science, university of Islamic Republic of Iran. Period 4, No. 2.

Al-Khatib, S.A., (2010). "Meta-cognitive self-regulated learning and motivational beliefs as predictors of college students' performance", International Journal for Research in Education (IJRE) (27)

Amin, M.E. (2005). Social science research, conception, methodology and analysis, Kampala: K.U.P

Baker, L., & Brown, A. L. (1984). Metacognitive Skills and Reading. In P. D. Pearson, R. Barr, M. L. Kamil& P. Mosenthal (Eds.), Handbook of Reading Research (pp. 353 - 394). New York: Longman.

Bandura, A. (1986). Social foundations of thought and action: A social cognitive theory. Englewood Cliffs, NJ: Prentice Hall

Biggs, J., & Moore, P., (1993). The Process of Learning (3rd ed.).New York: Prentice Hall

Boekaerts, M. (1997). "Self-regulated learning: A new concept embraced by researchers, policy makers, educators, teachers, and students", Learning and Instruction, 7, 161-186

Boekaerts, M., Maes, S. &Karoly (2005). "Self–regulation across domains of applied psychology: Is there a consensus?" Journal of Applied Psychology, 54(2) 149-152

Carver, C. S., &Scheier, M. F. (1990). Principles of self-regulation action and emotion", In T. Higgins & R. Sorrentino (Eds) Handbook of motivation and cognition. New York: Guilard Press.

Chen, C. S. (2002). “Self-regulated learning strategies and achievement in an introduction to information systems course”. Information Technology, Learning, and Performance Journal, 20 (1), 11-25

Cobb, J.R., (2003). The relationship between self-regulated learning behaviours and academic performance in web-based courses. Unpublished doctoral dissertation, University of the Virginia State at Blacksburg

Corno, L. and Mandinach, E. (1983). “The role of cognitive engagement in classroom learning and motivation” Educational Psychologist, 18: 88-108.

Cosnefroy, L. (2011). L’Aprenissageautoregule: Entre cognition et motivation,Presse universitaires de Grenoble, Grenoble

Craik, M.I.F, and Lockhart, S.R (1972). “Levels of Processing: A Framework for Memory Research”, Journal of verbal learning and verbal behaviour 11, 671-684

Creswell, J.W. (2012). Planning, conducting and evaluating quantitative and qualitative research”, Educational Research,(4th ed.). Pearson, New York.

Cross, D. R. & Paris, S. G. (1988). “Developmental and instructional analyses of children’s metacognition and reading comprehension”, Journal of Educational Psychology, 80(2), 131-142.

Danuwong, C., (2006). The role of metacognitive strategies in promoting learning English as a foreign language independently, Unpublished doctoral dissertation, Edith Cowan University

Delucchi, J., Thomas, J. and Rohwer, Jr. (1987). “Study time allocation as a function of grade level and course characteristics”, Contemporary educational psychology, vol 12, 365-380

Deming, M., Valeria-Gold, M., &Idleman, L. (1994). “The reliability and validity of the learning and study strategies inventory (LASSI) with college development students”, Research and Instruction, 33 (4), 309-318

Dignath, C., &Büttner, G. (2008). “Components of fostering self-regulated learning among students. A meta-analysis on intervention studies at primary and secondary school level”, Metacognition Learning, 3, 231-264.

Eldredge, J. & Palmer, D. (1990). “Learning and study strategies inventory-high school version”, Journal of Reading, 34 (2), 146-149

Ericsson, A., & Lehman, A. (1996). “Expert performance: Its structure and acquisition”. American Psychologist, 49, 725-747.

Flavell, J. H. (1979). “Metacognition and cognitive monitoring: A new area of cognitive developmental inquiry”, American Psychologist, 34(10), 906-911

Freeman, R.E (2004). “A Stakeholder Theory of Modern Corporations”, Ethical Theory and Business, 7th edn.

Garcia, T., &Pintrich, P. R. (1996). Assessing students’ motivation and learning strategies in the classroom context: The motivated strategies for learning questionnaire. In Alternatives in assessment of achievements, learning processes and prior knowledge, Boston: MA, Kluwer

Graham, S., & Harris, K. (1989b). “Improving learning disabled students’ skills at composing essays: self-instructional strategy training”, Exceptional Children, 56, 210-214.

Hadji, C. (2012). L’autoregulation, une voie pour la ressite scolaire. Reed Business Information

Hadwin& Winne, (1995). “Studying as self-regulated learners”, Educational psychologist 30 (4) 173-187

Hassan, R. & Ahmed, S., (2015). “Studying the relationship between self-regulation and high school students' academic motivation of the second course in county of larestan”, Indian Journal of Fundamental and Applied Life Sciences Vol.5 (S1), pp. 455-467

Hennessey, M. G. (1999). Probing the dimensions of metacognition: Implications for conceptual change teaching-learning, Paper presented at the annual meeting of the National Association for Research in Science Teaching, Boston, MA.

Hofer, B., Yu, S., &Pintrich, P.R. (1998). Teaching college students to be self-regulating learners. In D.H. Schunk& B.J. Zimmerman (Eds.), Self-regulated learning: From teaching to self-reflective practice (pp. 57-85). New York: Guilford.

Iran-Nejad, A. (1990). “Active and dynamic self-regulation of learning processes’, Review of Educational Research, 60, 573-602.

Kaya, S &Kablan, Z., (2013). “Assessing the relationship between learning strategies and science achievement at the primary school level”, Journal of Baltic Science Education, Vol. 12, No. 4.

Krejcie, R., & Morgan, D., (1970). “Determining sample size for research activities and Educational activities”. Journal of Educational and psychological measurement, 30, 608.

Kuhn, D. & Dean, D. (2004). “A bridge between cognitive psychology and educational practice”, Theory into Practice Journal, 43(4), 268-273.

Lachman, J., (1997).“Learning is a process: towards an improved definition of learning”, The Journal of Psychology 131: 477-480

Landline J, Stewart J. 1998. “Relationship between Metacognition, Motivation, Locus of Control, self-efficacy and Academic Achievement’, Canadian Journal of Counselling, 32(3), 200-212.

Lawanto, O. and Santoso, H. (2013). “Self-regulated learning strategies of engineering college students while learning electric circuit concepts with enhanced guided notes”, International Educational Studies, 6(3): 88-104

Lazin, R., & Neumann L. (1991). “Student characteristics as predictors of drop-out from medical school”, journal of Medical Education, 25 (5): 390-404.

Marton, F., Dall'Alba, G.&Beaty, E., (1993). “Conceptions of learning”, International Journal of Educational Research, 19: 277- 300

Marzieh, Y (2010). “Relationship between learning strategies and academic achievement; based on information processing approach”, Procedia Social and Behavioural Sciences 5 (2010) 1033–1036 Available online at www.sciencedirect.com

Mayo, (1993). “Health and Acedemic achievement”, Atlanta, GA: U.S. Department of Health and Human Services; 1993. Available online at www.cdc.gov/healthyyouth www.cdc.

Melburg, V., Lettus, M., &Bonesteel, J. (1993). Modifications of the LASSI for adult learners in distance education programs: a preliminary report, Paper presented at the Adult Learner Conference, University of the State of New York.

Mesri, K. (2008). "A disturbing drop in universities", Jems, vol 3 No. 2505, available online at http://jems.science-line.com

Miles, M. B., & Huberman, A. M. (1994). Qualitative data analysis: An expanded source book (2nd ed.). Newbury Park, CA: Sage

MINESEC, (2009). The guidance counsellor's terms of reference in Cameroon, National Printing Press, Yaounde-Cameroon.

Nist, S., Mealey, D., Simpson, M., & Kroc, R. (1990). "Measuring the affective and the cognitive growth of regularly admitted and developmental studies students using the learning and studies strategies inventory (LASSI)", Reading Research and Instruction, 30, 44-49.

Online Psychology Dictionary, available online at http://www.itseducation.asia

Pintrich, P.R., D.A.F. Smith, T. Garcia and W.J. McKeachie, 1991. A manual for the use of the motivated strategies for learning questionnaire, Ann Arbor: University of Michigan, National Center for Research to Improve Postsecondary Teaching and Learning

Pintrich, P. R., Smith, D. A. F., Garcia, T., &McKeachie, W. J. (1993). "Reliability and predictive validity of the motivated strategies for learning questionnaire", Educational and Psychological Measurement, 53 (3), 801-813

Pintrich, P. R. (1995). Understanding self-regulated learning, In P. R. Pintrich (Ed.), Understanding self-regulated learning (pp. 3-12). San Francisco, CA: Jossey-Bass.

Pintrich P.R., Zusho A. (2002). "The development of academic self-regulation: the role of cognitive and motivational factors", In A. Wigfield, J.S. Eccles (Eds.), Development of achievement motivation, A volume in the educational psychology series. (pp. 249284) San Diego, CA, US, Academic Press.

Pressley, M. and K.R. Harris, 2006. Cognitive strategies instruction: From basic research to classroom instruction, Handbook of Educational Psychology, 2: 265-286.

Pritchard, A., (2009). Ways of learning:Learning theories and learning styles in the classroom, Second ed, , London, New York, Routledge.

Prus, J., Hatcher, L., Hope, M., &Grabiel, C. (1995). 'The learning and study strategies inventory (LASSI) as a predictor of first-year college academic success", Journal of the Freshman Year Experience, 7 (2), 7-26.

Purdie, N., & Hattie, J. (1996). "Cultural differences in the use of strategies for self-regulated learning", American Educational Research Journal, 33 (4), 845-87

Sadi, O. &Uyar, M. (2012). "The relationship between cognitive self-regulated learning strategies and biology achievement: A path model", Journal ofSocial and Behavioural Sciences 93 (2013) 847 – 852

Schunk, D. H. (2001). Social-cognitive theory and self-regulated learning. In: B. J. Zimmerman & D. H. Schunk (Eds.), Self-regulated learning and academic achievement: Theoretical perspectives (2nd Ed). Mahwah, NJ: Lawrence Erlbaum Associates Inc.

Schunk D., & Zimmerman, B.J. (1994). Self-regulation of learning and performance: Issues and educational applications, Hillsdale: Erlbaum

Simona, S. & Carlo, C. (2015). "Metacognitive and Self-Regulated Learning Strategies Profiles: An Exploratory Survey of a Group of High School Students",Mediterranean Journal of Social Science,Vol 6, No 4 S3

Simsek, A., &Balaban, J. (2010). "Learning strategies of successful and unsuccessful university students", Contemporary Educational Technology, 1, 36-45

Somaye, S &Shahla, S, (2016). "The relationship between metacognitive and self-regulated learning strategies with learners' L2 learning achievement", International Journal of Research Studies in Language Learning 2016 April, Volume 5 Number 2, 97-106

Spinath B. (2012). Academic achievement, in Encyclopedia of Human Behaviour, 2nd Edn, eds Ramachandran V., editor. (San Diego, CS: Academic Press ;), 1–8.

Weinstein, C. & Meyer, R. (1986). The teaching of learning strategies. In M. Wittrock (Ed.), Handbook of research on teaching (pp. 315-327), New York: Macmillian

Weinstein, C., Schulte, A., &Cascallar, E. (1983). "The learning and studies strategies inventory (LASSI): initial design and development", Technical Report, U. S. Army Research Institute for the social and behavioural sciences, Alexandria, VA

Winne, P. (1996). "A metacognitive view of individual differences in self-regulated Learning", Learning and individual difference, 8 (4), 327-353

Wolters, C. A. (1999). "The regulation between high school students' motivational regulation and their use of learning strategies, effort, and classroom performance", Journal of Learning and Individual Differences, 11 (3), 281-299

Zare-ee, A., (2007). "The relationship between cognitive and meta-cognitive strategy use and academic achievement", Journal of Applied Psychology, 2(5): 105 -119

Zimmerman, B.J. (1989).Zimmerman, B. J. (1989). Models of self-regulated learning and academic achievement. In B. J. Zimmerman & D. H. Schunk (Eds.), Self-regulated learning and academic achievement: Theory, research, and practice (pp. 1-25). New York: Springer-Verlag.

Zimmerman B. J. (1990). "Self-regulated learning and academic achievement: an overview", *Educational Psychology* 25 3–17.

Zimmerman, B. (1986). "Becoming a self-regulated learner: Which are the key sub-processes?" Contemporary Educational Psychology, 11, 307-313

Zimmerman, B. J. (2002). 'Becoming a self-regulated learner: An overview", Theory in to Practice, 41 (2), 64-70

Zimmerman, B. & Martinez-Pons, M. (1986). "Development of a structured interview for assessing student use of self-regulated learning strategies", American Educational

Research Journal, 23, 614-628

Zimmerman, B. J., &Kitsantas, A. (1997). "Developmental phases in self-regulation: Shifting from process to outcome goals", Journal of Educational Psychology, 89, 29–36

Zimmerman, B., &Schunk, D. (2001). Self-regulated learning and academic achievement: theoretical perspectives. Mahwah, NJ: Lawrence Erlbaum Associates, Inc

## APPENDIX

**Questionnaire Administered to Students**

Dear students, I am Ambe Odette Ngwen, a Guidance and Counselling student from the Department of Sciences of Education of the Higher Teachers' Training College (ENS) Yaounde, carrying out an investigation for my end of training research project. The following questionnaire is for research purpose only. All the information you provide shall be kept confidential. Please, you are required to kindly and entirely fill this questionnaire and answer the questions as honest as possible.

### A. STUDY HABITS

This section seeks to get information on some of your study habits. There are no right or wrong responses. Tick the column on the table against each statement that corresponds to your opinion about the statement

| number | statement | Not at all true of me | Not true of me | neutral | True | Verytrue of me |
|---|---|---|---|---|---|---|
| 1 | When studying, I try to relate the material to what I already know | | | | | |
| 2 | When I study, I outline my material to help me organise my thoughts | | | | | |
| 3 | I make a lists of important terms when I am studying and memorize the lists. | | | | | |
| 4 | When studying, I read my class notes over and over again | | | | | |
| 5 | When I study, I write brief summaries of the main ideas of what I a studying | | | | | |
| 6 | I make charts and diagrams or tables to help me organize the material that I study | | | | | |
| 7 | When I study, I practice saying the material to myself over and over. | | | | | |
| 8 | When studying, I memorise | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | key words to remind me of important concepts in my notes | | | | | |
| 9 | I ask myself questions to make sure I understand the material that I am studying | | | | | |
| 10 | I try to change the way I am studying in order to fit the subject requirements and the teacher's teaching style | | | | | |
| 11 | When studying, I try to determine the concepts I do not understand well | | | | | |
| 12 | I often find that I have been reading my notes but don't know what it is all about | | | | | |
| 13 | I try to think through a topic to decide what I am supposed to learn from it when studying | | | | | |
| 14 | If the subject material I am reading is difficult to understand, I change the way I read the material | | | | | |
| 15 | During class time I often miss important points because I'm thinking of other things. | | | | | |
| 16 | When studying, I set goals for myself in order to direct my activities for each study period. | | | | | |
| 17 | When reading, I make up questions to help me focus on my reading | | | | | |
| 18 | I often study in a place where I can concentrate on what I am studying | | | | | |
| 19 | I make good use of my study time. | | | | | |
| 20 | I find it hard to stick to a study timetable. | | | | | |
| 21 | I have a regular place set aside for studying | | | | | |
| 22 | I make sure at the end of each | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | week I finish what I plan to study for the week | | | | | |
| 23 | I attend my classes regularly | | | | | |
| 24 | I rarely find time to review my notes or readings before an exam | | | | | |
| 25 | I often find that I don't spend very much time studying because of other activities | | | | | |
| 26 | I make sure I do all my assignments on time | | | | | |

**SECTION B: ACADEMIC PERFORMANCE**

Underline the range that corresponds to your response

27. What was your average for the First term? a) 0-5 b) 5-10 c) 10-15 d) 15-20

28. What was your average for the Second term? a) 0-5 b) 5-10 c) 10-15 d) 15-20

Thanks for your cooperation