THE FACTOR STRUCTURE AND PSYCHOMETRIC PROPERTIES OF THE STUDY SKILLS QUESTIONNAIRE AND THE MODERATING ROLE OF SELF EFFICACY IN ACADEMIC PERFORMANCE

BY

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ABSTRACT

The purpose of this study was to establish the factor structure and psychometric properties of the Study Skills questionnaire (SSQ) and the moderating role of self efficacy in academic performance. The study utilised a sample of (n=288) first year students doing Selected issues in Psychology at the University of Zimbabwe. A simple random sample was used to select participants in the study. A 64 item SSQ with 8 subscales and a 10 item College Student Self Efficacy scale (CSSE) were used in the study. 102 males and 186 females participated in the study. The two questionnaires were directly administered to the participants. The reliability of the SSQ subscales ranges from 0.71 to 0.87 in the study as compared to the original reliability ranging from 0.85 to 0.86. The overall reliability of the SSQ is cronbach alpha .90 in the study. The results were factor analysed in principal component, oblique direct oblimin with Kaiser Normalisation and delta was set at 0. Two latent factors with eigenvalues greater than 1 were extracted. Factor 1 had motivation, reading and writing loading onto it and factor 2 has test strategy, time management, information processing, concentration and study aids loading onto it. This confirms previous research on the standardisation of the SSQ. Hierarchical regression was done to assess the total variance of study skills and self efficacy in predicting academic performance. Study skills have a variance of 52.5% and self efficacy has an incremental value of 9.3%. Results show that self efficacy moderate the relationship between study skills and academic achievement as indicated by the interaction effect between study skills and self efficacy. However future research should try to increase the scope of the study and increase the number of factors in the study.
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DEDICATION

I respectfully dedicate this project to my late mom Emilda and my dad Mr E N Gwamanda for their aspirations to see me grow into an intellectual. Your support will always be cherished. My wife Fab, your respect for my advancement will forever be honoured.
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CHAPTER ONE

1.0 Introduction

This chapter gives a brief background of the study, the statement of the problem, research questions and objectives, justification of the study and the delimitation of the current study. It also gives a brief overview of the methodology used in the study.

1.1 Background

Since independence, the government of Zimbabwe has given much priority to the education sector among other social services. This was a dawn of a new era for a country which had suffered for close to a century from colonial rule. More schools were built and the infrastructure of the existing ones was improved and more native teachers were trained with more training colleges opened in the first decade. With a move towards high economic growth, education took centre stage. With the passing on of years over the decades, the rate of passing among students was generally increasing, with the availability of materials to use and more qualified personnel. However, recent evidence shows that the pass rate for secondary school education has been declining during the last decade (Marufu, 2013). For ordinary levels the pass rate further declined from a low level of 19.5 % down to 18.4%. Several factors have been established to try to explain the poor performance of students. The School Examination council has put the blame on the rise in candidature by 11.3% (Marufu, 2013) and this makes sense from an administrative perspective but from a psychological point of view it is not valid enough to explain the failures. Other circles have labelled the rise in colleges mushrooming across the country, with poor infrastructure and inadequate material for teaching as major causes. The economic crisis that has bedevilled the country was not an exception (Ndlovu, 2013). This is said to have affected the motivation of teachers with the majority leaving the country for greener pastures. As a result most teachers who are undertaking the teaching duties are unqualified. The list of causes is endless depending on the authority interrogating the matter. The pass rate has generally been very low with the highest figures of only 25% at national level (Ndlovu, 2013).
However, the world over, the student’s academic excellence is of paramount importance to numerous stakeholders, including students themselves, their families, and the nation at large only to mention but a few. In a quest to try and enhance student performance, several researchers and scholars have attempted to establish the skills that influence academic achievement among students. These skills have taken different names; learning strategies, study skills, meta-cognitive skills, and success skills among other names (Bonanle, Morakinyo & Adeuya, 2009). The researchers have found that study skills are good predictors of academic performance among secondary schools and college schools (Jones, 1996), that is, a student with high study skills has a high chance of excelling academically. However, the majority of the studies that has been conducted were done in the western world and very few in Africa and a lot need to be addressed within the local context in relation to cultural and economic variations as well as the effect of moderating variables in the relationship between study skills and academic success. As a country we have never attained high percentages of academic performance with an average having ranged around 25% (Ndlovu, 2013). This has raised the need to look for the factor structure and psychometric properties of the Study Skills Questionnaire (SSQ) within the Zimbabwean context in order to use it to influence student performance.

1.2 Statement of the problem

Numerous researches have been done on study skills and how they affect academic performance among students with instruments developed to assess the level of study skills employed by the students, but most of them have been in the developed world, for example Weinstein and Palmer, (1990). African researches on study skills are very limited and are restricted to West Africa hence the need to assess cultural dynamics in the factor structure of the questionnaire since they are culturally centred and that the theoretical approaches embodying it may be inconsistent. Empirical and conceptual composition of the SSQ across cultures and countries are possible. This follows the importance of confirming the efficacy of the hypothesised factor structure of the SSQ before using it in the local context. This confirmation of the reliabilities and validities makes it possible to do comparative analysis of local and international research. The researcher feels that the studies done in Africa for example Bonanle, Morakinyo and Adeuya, (2009) overlooked the effect of moderating factors like self efficacy in their newly developed questionnaire. They assumed that no
intervening variables exist. Therefore, there is need to assess the degree to which self efficacy moderates the relationship between study skills and academic performance.

1.3 Justification of the study

The assessment of the factor structure and psychometric properties of the SSQ on a Zimbabwean sample will add value because the instrument will be culturally sensitive and can be used to positively change the attitude of students towards school. The assessment of the moderating role of self efficacy on the relationship between study skills and academic achievement gives clarity on whether it is one of the other factors that strengthen this relationship or not. The questionnaire which will be culturally sensitive will assist:

(i) Poorly motivated students in schools through changing their attitude towards school
(ii) Academically challenged students at any level at college through positive feedback
(iii) Students through boosting their learning potential.
(iv) Students to develop awareness of their learning and studying strengths.

1.4 Research questions

• Does the SSQ have sound psychometric properties and factor structure in the Zimbabwean context?
• Does self-efficacy moderate the relationship between study skills and academic performance?

1.5 Objectives of the study

• Establish the factor structure and psychometric properties of the study skills questionnaire
• Determine the influence of self-efficacy in the relationship between study skills and academic performance.

1.6 Hypothesis

1. \( H_0 \): The SSQ will have the same factor structure and psychometric properties in Zimbabwe as in the Nigerian sample

\( H_1 \): The SSQ will have a different factor structure and psychometric properties in Zimbabwe compared to the Nigerian sample

2. Self efficacy moderates the relationship between study skills and academic performance

1.7 Assumptions

The assumptions were that enough resources that aid academic success were at the student’s disposal in the academic institution. It was further assumed that the lecturers were highly motivated and delivered to their fullest potential

1.8 Overview of the methodology

A quantitative research design was used in the research. Simple random sampling was used to select the respondents in the study, giving equal chance to all the participants to take part in the study. Study Skills and Academic Self efficacy questionnaires were administered on a total of 288 students and their reliabilities were assessed. Exploratory factor analysis was then done to assess the latent factors within the SSQ. Two latent factors were identified in the instrument after a principal component analysis rotated through oblimin with Kaiser normalisation. Hierarchical multiple regression analysis was done to verify the model fit of the observed variables. Hierarchical multiple regression was also used to assess the degree to
which self efficacy moderates the relationship between study skills and academic performance.

1.9 Limitations of the study

The study only utilised undergraduate students doing Introduction to Psychology at the University of Zimbabwe. Comparisons across different departments and faculties would have demonstrated the variations in the study skills amongst students in different departments and faculties. However the sample size was big enough to cover enough students giving more room for accurate results.

1.10 Definitions of key terms

**Study skills** refers to the competence in acquiring, recording organising, synthesising, remembering and using information and ideas and are among the skills that can be modified for learners of all ages (Harvey, 1995).

**Academic self-Efficacy** refers to the student’s beliefs in their capabilities to learn or perform behaviour at designated levels (Bandura, 1986, 1977).

**Academic achievement** refers to achievement in terms of actual mark or score obtained in an exam.

**Moderator variable** is an independent variable that affects the strength and or direction of the association between independent variable and criterion variable.

1.11 Delimitation of the study

The current study assessed the factor structure and psychometric properties of the SSQ and the moderating effect of self efficacy on the relationship between study skills and academic performance.
achievement. The study made use of samples of first year psychology students at the University of Zimbabwe.

1.12 Organisation of the dissertation

Chapter one as indicated, provides the background of the study, statement of the problem, justification of the study, research questions and objectives, brief overview of the methodology used in the study, limitations of the study and definitions of key terms. Chapter two outlines the review of the empirical and theoretical literature related study skills and academic self efficacy. The theoretical model to be tested is also demonstrated in chapter two. Chapter three presents the methodology used in the study. These include the research design, the sampling procedure used, the instrumentation, data analysis procedures and ethical consideration. Chapter four outlines the results found in the study in graphical and table form. A brief discussion of the results is given in chapter five. Chapter five also gives a summary of the results and the degree to which research questions are answered by the results. This chapter also gives conclusions drawn from the study and recommendations for future research.
CHAPTER TWO

2.0 Introduction

This chapter outlines the literature which is related to the current study. Theoretical explanations of study skills and self efficacy will be explained. The relationship of study skills and self efficacy with academic achievement will be critically discussed. This chapter will also demonstrate the model depicting the theoretical relationships between study skills and academic achievement and the moderating role of self efficacy.

2.1 Literature review

The concept of study has been defined as a systematic acquisition of knowledge and an understanding of facts and principles that calls for retention and application (Mace, 2002). Kelly (1998) defines study as the application of one’s mental capacity to the acquisition, understanding and organisation of knowledge which often involves some formal learning. Okorodudu (2000) explained study as subject matter mastery which involves hard work. However, in the broader literature study skills refers to the student’s knowledge of appropriate study strategies and methods and the ability to manage time and other resources to meet demands of the academic tasks (Osa-Edoh & Alutu, 2012). Harvey (1995) defines study skills as competence in acquiring, recording, organising, synthesising, remembering and using information and ideas and is among the skills that can be modified for learners of all ages.

Researchers have attempted to assess the skills which are employed by students in their studies. Several instruments have been developed to measure these skills and their influence on academic performance. Michael and Zimmerman (1985) developed the Study Attitudes and Methods Survey Revised Short Form. Karnes and Bear (1990) developed the process skills rating scales, Jackson, Keid and Cednic (1979) developed the Study Habits Evaluation and Instruction Kit (SHEIK). SHEIK measures skills although it was standardised on a New

2.2 Models of study skills

Students’ learning is rooted in the approaches that the student uses in their studies. Several approaches have been looked into by researchers who were trying to make sense on the individual differences in student performance. Two of the approaches will be discussed here.

2.2.1 Information processing model

This approach is grounded in the information processing approach of memory which postulates that information that is processed at deeper levels is likely to be remembered by people than information processed at surface level (Craik & Lockhardt, 1972). With deep processing an individual relates new knowledge with the existing information. The surface approach focuses on memorisation which only pays attention to new information without relating it to old or existing information. Entwistle, Hanley and Hounsell, (1979) further expanded the information processing approach by adding a third dimension resulting in three processing approaches. The third pillar, which is the strategic approach, is driven by the person’s desire to attain higher grades with no regards to learning. Literature has acknowledged this general framework and the efficacy of the deep approach to studying (Watkins, 1983). Entwistle et al., (1979) also looked into the motivational determinants associated with the processes. According to them the deep approach is driven by the individual’s commitment to learning and their internal motivation. The surface approach is influenced by external motivation.
2.2.2 Meta-cognitive skill model

Meta-cognitive processes have been defined as awareness of one’s cognitive processes and products and the active monitoring and resultant regulation of those processes in relation to cognitive objects and the data they contain (Flavell, 1976). Students whose meta-cognitive and self regulation abilities are high are likely to be actively involved in their own processes of learning (Zimmerman, 1986).

2.3 Dimensions of study skills

Research on study skills has found several factors that have a bearing on student achievement. These study skills encompass a variety of activities including time management, setting appropriate goals, selecting main ideas, appropriate study environment, employing appropriate note taking strategies, concentrating, self testing and managing anxiety (Osa-Edoh & Alutu, 2012). Numerous studies have found a positive relationship between study skills and academic success in college students (Jones & Slate, 1992; Jones, Slate, Perez & Marini, 1993; Lazarous, 1991 & Miller, 1991). Some of the study skills are briefly described below.

2.3.1 Study Environment

Of the variables that constitute study skills the study environment has been found to have much influence on the success of students in their studies. The environment has been found to have a bearing on how students master on their areas of specialisation (Ruch, 1995). The study area is on its own stimuli which should elicit the desire to study (Osa-Edoh & Alutu, 2012). The chair and desk should enable the student to maintain an erect position which is comfortable for reading (Ruch, 1995). The desk should also have enough space to accommodate all the reading materials of the student. Temperature and humidity also impact
on the bodily functioning of the student. High temperatures compromise bodily functioning, hence the need for abundant fresh air in the study room.

Glaring light is not good for study as it strains the eyes of the reader and may cause headaches, therefore bulbs should be covered or light coloured to reduce the intensity (Hills & Ballow, 2000). Insufficient light on the other hand has the same effect of straining the eyes. However, light should not directly shine on the desk for it affects the reader.

Some students may enjoy background music during study and research, Hills and Ballow (2000) found that if the music is not noisy it may function as a neutraliser of some external stimuli which may disturb the study process. The findings indicated above implies that efforts should be made to ensure that the environment for study is fit for optimum performance though the student needs to make an extra effort to behave in the correct way.

2.3.2 Time Management

Time management has been defined as strategies for managing, planning and using time appropriately. It has been found to predict college grand point average and quality of academic performance in terms of the relationship between specific study skills and academic achievement (Britton & Tesser, 1991). The amount of time that the student allocates on their courses, the time of the day on which they study affects the student’s success. Allocating appropriate time for the different courses and setting time limits enables students to fulfil their set goals and avoid any form of distraction (Robinson, 1990). Diarising all the activities to be done enhance proper time management (Hills & Barrow, 2000).

However on the other side is procrastination which according to Steel (2007) consists of an intentional delay on a course of action despite the knowledge of the negative results of such actions. Such delay usually results in poor performance (Klassen, Krawchik & Rajani, 2005). In academic contexts postponement of activities like exam preparations and doing homework
late, constitute academic procrastination and students usually feel very uncomfortable as a result. Anecdotal evidence suggests that 95% of college students procrastinate (Ellis & Knaus, 1997). Other researchers estimate the variance of procrastination to range from 25 to 50% and this is usually dependent on the academic task at hand (Solomon & Rothblum, 1984). Van Erde (2003) found a moderate to strong negative correlation between academic procrastination and academic performance. Effects of stress, guilt, low self esteem, neuroticism and low grade have been found to be related to procrastination. Time management and procrastination appear to be on opposite ends of a continuum, such that more of the other leads to less of the other. So students should maximise on appropriate time management for them to be successful in their school.

2.3.3 Concentration

Unwanted distractions pose a great challenge to students in their quest to achieve academic goals. This is so because distractions are inevitable and for students to be successful they should continuously exert much effort in the face of those distractions. This is usually the case for example when students are doing homework, paying attention during a lecture and during a test (Parks-Stamm, Golwitzer & Oettingen, 2010). Therefore one’s ability to focus on a task is essential for effective study. Robinson (1990) found five factors which influence the student’s concentration. These are psychological conditions (personal conflicts that are not properly handled and keeps flashing in one’s mind), nature of the study materials (materials not convenient), poor lighting, internal and external distractions. These negatively impact on the student. External distractions can only be avoided if the student chooses an environment that stimulates them to study (Oladele, 2000). Such environments avoid indecision, daydreaming, physical fatigue and anxiety (Bonanle et al., 2009; Weinstein, 1992).

The ability of the student to concentrate enables them to remember much of the important information. Oladele (2000) found four types of remembering which are recognition, recall, reproduction and performance. The interaction of these forms of remembering, facilitate the student to automatically perform even the other habits they have learnt. Working memory was also found to play a vital role in a variety of regulatory functions for example retrieval of
information from long term memory (Baddeley, 2000). According to Alloway and Alloway (2010) multiple components within the working memory temporarily store and manipulate some information and these components do this as a coordinated activity. Beilock and Carr (2005) found the predictive utility of working memory to academic achievement to be very positive.

### 2.3.4 Study aids and note taking

The positive impact of note-taking and reviewing has encouraged researchers to look into the processes students engage in during note taking and reviewing (Grabe, 2005). From the student’s perspective, note taking stimulates them to attend lectures, and to comprehend the materials they will have learnt and subsequent recall (Kobayashi, 2005). Instruction on note taking strategy significantly influences academic achievement (Haghverdi, Biria & Karimi, 2010). These are in support of the perspective that the process of effective note taking plays a major role in academic performance.

### 2.3.5 Test strategies

Counsellors, educators and researchers have for a long time paid particular attention to the emotional experiences of students especially during their test writing. Anxiety during examination writing was found to have detrimental effects on overall exam performance, test performance and overall student well being (Bannacio & Reeve, 2010). Hunsley’s (1985) study also found that test anxiety is related to poor performance of students. An inverse relationship was also found between test anxiety and grand point average in students (Chapell, 2005). Efforts should be made to ensure the levels of anxiety for the students are lower so that students’ performance can reach optimal levels. As a result test results would reflect the student’s level of knowledge on the subject matter.
2.3.6 Information processing and organisation

This dimension is grounded in the information processing model of memory. Most students who face challenges at school lack skills of self organisation than intellectual skills. Those who are self disciplined and organised are highly motivated in school (Komarraju, Karau & Schmeck, 2009). The degree of information processing also plays a major role in academic achievement. Information processing happen at two levels: surface level and deep level processing. Surface level information processing consists of strategies such as memorisation, repetition and analysing information. Deep level processing involves relating new information with already learned information, structuring information and critical thinking (Rozendaal, Minnaert & Boekaert, 2003). These two levels of processing embed a sense of self regulation in them such that students who tend to memorise the information presented to them by the lecturer rely more on external regulation. However, students at deep level processing are likely to be self regulating (Vermunt & Verloop, 1999). Students should be taught to utilise deeper levels of processing as this can sustainable and leads to better performance.

2.3.7 Motivation and attitude

Intrinsic and extrinsic drives are some of the important psychological aspects in education. Intrinsic motivation refers to behaviour done because something is inherently interesting while extrinsic motivation refers to doing something because it leads to a desired outcome (Deci, Vallerand, Pelletier & Ryan, 1999). Komarraju et al., (2009) found that the variations in academic success result from individual differences in motivation and achievement.

2.3.8 Reading and selecting main ideas

Early successful reading has been found to have positive implications on academic and psychological outcomes (Kern & Friedman, 2009). College education requires a student to
comprehend the academic materials and the conceptual framework such reading comprehension strategies play a critical role in the process. With reading comprehension strategies, students can manage to recall major points, select important information from less important and think about the main ideas and the ability to comment on the main subject (Cogmen & Saracaloglin, 2009). Van Dijk and Kintsch’s (1983) strategic discourse processing theory identified three levels of mental representations which can be developed when a student is reading. These are the surface structure with phrases and words, the text base for the semantic content and the rhetorical structure and the situation model in which prior knowledge influences the student’s inferences on elaborated text content. The various mental representations have a relationship with the levels of text processing (Lonka, Ylanne & Maury, 1994). Successful student in examinations and tests use more reading strategies (Taraban, Kerr & Rynearson, 2000).

Weinstein and Palmer (1990) found ten dimensions of study skills which tapped into three broad categories. The categories are self regulation, skill and will. The self regulation category has dimensions such as concentration, time management self testing and study aids. The skill component has information processing, selecting main ideas and test strategies. Lastly the will component has anxiety motivation and attitude. All these form what they called Learning and Study Strategies inventory (LASSI). However Bonanle et al., (2009) factor analysed the LASSI and came up with two categories, will and skill with eight dimensions. Will component has writing, reading and motivation and the skill component has time management, concentration, test strategies, study aids and information processing. This study’s main aim was to assess the factor structure and psychometric properties of the newly developed SSQ and the degree to which self efficacy moderates the relationship between study skills and academic performance. Eight dimensions are measured in the instrument and have sound reliabilities ranging from .85 to .86.

2.4 Social cognitive theory

Self efficacy is rooted in Bandura’s (1986) social cognitive theory which focuses on the person’s beliefs in their capabilities to learn or perform behaviour at designated levels
Research has shown that self efficacy influences learning as well as academic achievement (Pajares, 1996). It has been found to account for 14% of the variance in academic performance and 12% of variance of academic persistence. In a study done on engineering and science students, those with high self efficacy earned higher grades and were persistent in their majors (Lent, 1986).

Much of the interest in self efficacy stems from Bandura’s claims (1977, 1982, 1984, 1986, 1989, 1991, 1993) that the way a person judges their capability towards a certain task strongly predicts the performance that will result from that task and moderates the other factors that influence that performance. In other words if a student judges a situation as attainable then it’s likely that they will highly perform that task. The sources of information that student appraise their self efficacy are vicarious experience, persuasion from others and performance accomplishment. Various researches, including Bandura have shown how students’ perception on their ability to perform a task greatly affects their success. Bandura (1994) said that learners who possess high levels of self efficacy are not intimidated and challenged by complex assignments and projects which they see as an opportunity for growth and mastery. In difficult situations such students persist until success is achieved. To them failure is temporary, but those with low self efficacy feel threatened by the failures and they try to avoid them. They attribute their failure to their lack of capacity and ability to persist in the face of difficulties.

Research on perceived academic self efficacy and student learning have confirmed that perceived self efficacy greatly influences the aspiration of student level of interest in academic pursuit, academic accomplishment and how they prepare themselves for different occupational careers (Bandura, 1989; Zimmerman, et al., 1992). Student’ academic self efficacy beliefs affect their choice of tasks, persistence, effort, resilience and academic achievement (Bandura, 1997; Schunk, 1995)
2.5 Development of self efficacy for students

Self efficacy varies along three dimensions, which are strength, level and generality (Bandura, 1997). There is variance in the level of difficulty on tasks that people can perform, strength of their beliefs in their ability to succeed at some level of difficulty. On generality, efficacy beliefs associated with one activity can be generalised to similar situations within the same activity domain or across a range of activities (Holladay & Quinones, 2003). There exists a general form of self efficacy that applies to a range of activities in the domain of learning in the university. Measured effects of generalised self efficacy on expected and actual performance are small particularly when student ability and other influences are taken into account (Valentine, Dubois & Cooper, 2004). Valentine et al., (2004) in a meta-analysis, estimated a mean effect on actual performance of 0.08 although the correlations of up to 0.36 are reported in the literature. However the effects are statistically significant.

2.6 Measuring self efficacy in academic settings

Most research on academic self efficacy has focused on high school students’ self efficacy and they have utilised scales by Bandura (Bandura, 2001; Zimmerman, 1995). Bandura’s instrument measures a variety of academic activities in relation to general performance at school, and the scale cannot be valid outside school settings. Researchers have developed several self efficacy scales for post high school students (Elias & Loomis, 2000; Wood & Locke, 1987). Of the scales neither of them dominates the other as they were developed to address specific outcomes. Wood and Locke (1987) scale is one such scale that assess the general academic self efficacy. Its focus is on six activities that are generally done by students in their studies. These are memorisation, note-taking, discriminating concept, explaining concept, understanding and concentration. They focused their attention on the level and strength of students’ efficacy beliefs.
2.7 Self efficacy for college students

Self efficacy influences the individual’s level of commitment to successfully reach desired outcomes. As the self efficacy theory states, the strength and level of efficacy beliefs determine the course of action in an individual’s behaviour, the level of effort to be exerted and the sustainability of the effort exerted. According to Bandura (1993) human beings make decisions based on their perceived self efficacy by pursuing activities and situations which they feel are within their capacities for success, and avoid situations they feel will lead to failure. When perception of self efficacy is strong, much effort is put in order to fulfil the task despite the challenges faced in the process. However despite it (self efficacy) being an important factor on human behaviour it must be noted that self efficacy is not the only factor that influences performance since behaviour is a function of several variables. Factors like outcome expectations, skills and perceived value of outcomes comes into play (Schunk, 1991). If an individual has insufficient skills, self efficacy will produce weak performance outcomes. Bandura (1997) says that self efficacy beliefs are not stable once they are formed; rather there is a variation in the strength of the beliefs as a result of the individual’s evaluation on new information. However with the passage of time and accumulation of more information, self efficacy beliefs are likely to be stable.

2.8 Self efficacy for self regulated learning

Self regulated learning has been defined as self generated feeling, thoughts and actions which have an orientation towards the students’ attainment of goals (Zimmerman & Schunk, 1989). Personal interest and satisfaction are the major drivers of academic focused behaviours. Self-regulated learners are behaviourally and meta-cognitively active and they use their meta-cognitive strategies to fulfil academic activities (Ablard & Lipschultz, 1998). They exert much effort and are persistent in their accomplishment of goals (Wolters, 1998). Research evidence supports that for students who engage in academic activities there is a likelihood of high academic achievement (Zimmerman, 1989). As a result, students who are self regulated learners are high achievers (Zimmerman & Martinez-Pons, 1990). The use of self regulating
strategies enhance the students’ ability to organise and transform information, self rewarding and punishment based on performance and ability to seek peer and adult assistance.

Self efficacy motivates students through goal setting, self evaluation and strategy and it induces a sense of agency (Zimmerman, 2000). The more the students judge themselves as more capable the more challenging the goals they pursue (Zimmerman, Bandura & Martinez Pons, 1992). In a study by Zimmerman et al., (1992) self efficacy had an incremental validity of 35% in predicting college students’ final grades in a writing course when compared with the verbal subscale of Scholastic Aptitude test.

2.9 Educational correlates of self efficacy

Several research findings confirm the existence of high correlation between self efficacy and achievement outcomes (Bandura, 1997; Parajes, 1996; Schunk, 1995). There is also high correlation between self efficacy and indexes of self regulation especially effective use of strategies for learning. Students whose self efficacy is high in problem solving tend to persist longer and display greater performance monitoring than students with lower self efficacy (Bouffard-Bouchard, Parent & Larivee, 1991). There is also high positive correlation between self efficacy and the goals of the student in course achievement, their satisfaction with potential grades and actual achievement (Zimmerman & Bandura, 1994).

2.10 Predictive utility of self efficacy

The utility of self efficacy in predicting outcomes has also been tested using causal models. Schunk (1981) used path analysis to produce a correlation matrix comparing long division instructional treatment, self efficacy, persistence and achievement as compared to prior experience, maths anxiety, and perceived usefulness of Mathematics or self Concept. Mathematics self efficacy was found to predict achievement in Mathematics (Parajes & Miller, 1994). Mathematics self efficacy like mental ability which is presumed to be the
highest predictor of academic achievement has also been found to highly predict achievement (Parajes & Kranzler, 1995)

With the positive influence that self efficacy has on academic achievement it is necessary to assess the degree to which it moderates the relationship between study skills and academic success for students.

Figure 1. The relationship between study skills, self efficacy and academic achievement

The model in figure 1 above demonstrates that study skills influence academic achievement as supported by the literature. The aim of this study is to determine the degree to which self efficacy moderates influence of the student’s study skills on their academic achievement.

2.11 Chapter summary

Academic excellence is at the epicentre of any education system within a focussed economy and the determinants of success draws attention of educationists, students among other major stakeholders. This chapter gives a brief literature review of the studies that tried to explain the relationship between skills of studying and their influence on academic performance. Two models which embed studying are briefly explained, followed by a description of various
skills used in studying by students. The self efficacy theory is also described in this chapter, and its implication on academic performance clearly explained. Efforts are also made to demonstrate how self efficacy for students develops, its predictive utility and its educational correlates. The chapter ends by illustrating the theoretical model being tested in this study.
CHAPTER THREE

3.0 Methodology

The goal of this study was to assess the factor structure and psychometric properties of the study skills questionnaire and the moderating effect of self efficacy in academic performance. This chapter outlines the methodology used in the study. It gives the research design, the sample, instrumentation, the procedure used, data analysis and ethical considerations.

3.1 Research design

The current study was guided by a quantitative research design. The quantitative approach enabled the easy identification of the variables that predicts the criterion under study. This design was chosen because of the nature of the variables under study (independent and dependent).

3.2 Participants

Participants were drawn from randomly selected first year students doing Selected Issues in Psychology, a first year course at the University of Zimbabwe. These students are majors in Psychology, Sociology, Social work, Occupational Therapy, Nursing Science, and Physiotherapy. These students were chosen because they could easily comprehend the questionnaire and were readily available for the study. The assumption was that the lecturers at the University of Zimbabwe are motivated to teach. The other assumption was that the learning conditions at the university are favourable for effective learning of the students especially with the availability of reliable internet facilities and improvement on the library services.
3.3 Sampling technique

A simple random sampling was used to select the subjects for the study. This technique was used since it is easy to use and allowed equal chances of participation to the subjects. A sample of \( n = 288 \), was used in the study. 183 females participated in the study constituting 63.5%. 102 males participated in the study constituting 35.4% as indicated in table 1 below. 300 questionnaires for the two questionnaires, study skills and self efficacy, were each distributed and administered and 288 were filled and returned giving a response rate of 96%. Informed consent was obtained from the respondents before the subjects participated in the study with the consent form attached to the questionnaires. All the information about the study was made available to the participants. To ensure confidentiality respondents were not required to give their names in the study but rather numbers were be allocated to them. Their numbers on their tutorial group register were used. Respondents were given the freedom to exit the process if they felt like doing so. Table 1 below summarises the demographics (departments and gender)

<table>
<thead>
<tr>
<th>Department</th>
<th>psy</th>
<th>soc</th>
<th>soc wrk</th>
<th>HO T</th>
<th>NS</th>
<th>PT</th>
<th>Gender</th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>90</td>
<td>66</td>
<td>54</td>
<td>27</td>
<td>29</td>
<td>22</td>
<td>102</td>
</tr>
<tr>
<td>%age</td>
<td>31.3</td>
<td>22.9</td>
<td>18.8</td>
<td>9.4</td>
<td>10.1</td>
<td>7.6</td>
<td>63.5</td>
</tr>
<tr>
<td>F</td>
<td>183</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>183</td>
</tr>
<tr>
<td>%age</td>
<td>56</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>56</td>
</tr>
</tbody>
</table>

As can be seen in table 1 above 90 Psychology students participated in the study constituting 31.3%, Sociology, 66 constituting 22.9%. 54, 18.8%, came from Social Work, 27, 9.4% came from Occupational Therapy, 29, 10.1% came from Nursing Science and 7.6%, 22 came from Physiotherapy.
Table 2 Mean and standard deviations of age, gender and department

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>288</td>
<td>20.090</td>
<td>.85946</td>
</tr>
<tr>
<td>Gender</td>
<td>288</td>
<td>1.6667</td>
<td>.53452</td>
</tr>
<tr>
<td>Department</td>
<td>288</td>
<td>2.6701</td>
<td>1.60103</td>
</tr>
</tbody>
</table>

Table 2 above shows the standard deviations and means of the demographic characteristics. It can be seen from table 2 above that the mean age was 20 years with a standard deviation of 0.859. The standard deviations for gender and department are 0.535 and 1.601 respectively.

Table 3 Frequencies of the age groups

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>73</td>
<td>25.3</td>
<td>25.3</td>
<td>25.3</td>
</tr>
<tr>
<td>20</td>
<td>150</td>
<td>52.1</td>
<td>52.1</td>
<td>77.4</td>
</tr>
<tr>
<td>Valid</td>
<td>21</td>
<td>13.9</td>
<td>13.9</td>
<td>91.3</td>
</tr>
<tr>
<td>22 and above</td>
<td>25</td>
<td>8.7</td>
<td>8.7</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>288</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Table 3 above shows the percentage contributions of the various age groups that participated in the study. 19 years age group contributed 25.3%, 20 years, 52.1%, 21 years, 13.9%, and 22 and above contributed 8.7%.

3.4 The instruments

3.4.1 The Study Skills Questionnaire

The SSQ questionnaire by Bonanle, Morakinyo and Adeuya, (2009) was used to measure the study skills of the students in the study. The SSQ has 64 items which are grouped into 8 subscales. The score of the least response has a score of 1 and the highest option of 4.
Two broad categories have been found to relate to the SSQ. These are will and skill. The skill component assesses test strategies, information processing, study aids, concentration and time management. Information processing measures the student’s ability to strategise and use their reasoning skills to link what is being learnt and what they have already learnt. Their acquisition of knowledge and its retention is also measured under information processing. Test strategies measure the student’s preparedness on the test and their ability to apply test strategies. Study aids measures how the student make use of the relevant support materials. It also assesses the student’s ability to comprehend their text books and their use of alternative sources of information. Concentration measures how attentive the student is during lectures and study and their ability to reduce distraction from negative external stimuli. Time management measures the degree to which the student adheres to their principles of time management and their ability to allocate appropriate time to the various courses.

The will component has the reading, motivation and writing dimensions. Motivation domain assesses the student’s self discipline and diligence towards academic projects. Reading and writing involve the ability of the student to read and write meaningful information.

The New Study Skills Questionnaire was adapted from the Learning and Study Strategies Inventory (LASSI) by Weinstein and Palmer, (1990). The reliability of LASSI is 0.82. The sub scales of LASSI ranges from 0.73 to 0.89. LASSI has three broad categories which are self regulation, will and skill. Self regulation has time management, concentration, self testing and study aids. This category measures the student’s ability to self regulate and have overall control over their learning. The will component has motivation attitude and anxiety. This category measures the student’s ability to be receptive to new knowledge and the zeal to exert more effort for academic attainment. The skill component has selecting main ideas, information processing and test strategies.
3.4.2 Reliability

The new study skills questionnaire has an original split half reliability of 0.823 for the first part which comprised time management, concentration, study aids and test strategy. The split half reliability for the second part comprising information processing, motivation, reading and writing is 0.802. The sub scales have reliability ranging from 0.85 to 0.86. With time management subscale having reliability of 0.86, information processing, 0.86; concentration, 0.86; study aids, 0.85; test strategies, 0.85; selecting main ideas, 0.86; writing, 0.86 and motivation, 0.86. The reliability of the SSQ in the current study was cronbach alpha 0.90. With the time management subscale having reliability of 0.71; concentration, 0.87; study aids, 0.71; test strategies; 0.88; information processing, 0.73; selecting main ideas, 0.87; motivation, 0.75 and writing at 0.82.

3.4.3 College student self efficacy questionnaire and its reliability

Academic self efficacy was assessed using the college student self efficacy questionnaire (CSSE) by Laundry (1992). The questionnaire has ten items which measures the strength of students’ efficacy beliefs. The CSSE has an original reliability of cronbach alpha 0.82. The CSSE has a reliability of cronbach alpha 0.84 in the current study. The college student self efficacy questionnaire was adapted from Zimmerman, Bandura and Martinez-Pons (1992) self efficacy for self regulated learning.

3.5 Procedure

The researcher obtained an approval letter from the Department of Psychology and was then given permission by the Registrar to conduct the research. Lecturers, Teaching Assistants and the students who participated in the research were formally informed and their consent was obtained. The researcher utilised tutorial time to easily get access to the students and administered his instruments with the help of Teaching Assistants. A pilot study was initially
conducted to test the behaviour of the instruments within the local setting. No changes were done to the SSQ since it had reliability of 0.73 and is above the minimum of 0.70. The college student self efficacy questionnaire was piloted and had reliability of 0.76. Criterion scores (mid semester examination results) were obtained from the lecturers within the department of Psychology.

3.6 Data analysis

Exploratory factor analysis was done to explore the underlying factor structure of the variables within the SSQ. Two latent factors were identified in the instrument after a principal component analysis rotated through oblique direct oblimin with Kaiser Normalisation. This oblique solution was used since there is correlation between the subscales of the SSQ. It was also used because the variables are continuous. Pearson correlation was used to determine the degree of relationship between the study skills at global level and academic grades. Pearson correlation was also used to assess the level of relationship between the sub scales of the SSQ and academic grades. The relationship between self efficacy and sub scales of the study skills questionnaire were assessed using hierarchical multiple regression analysis. The statistical analysis measured and tested the differential effect of the study skills on performance on mid semester examinations as a function of self efficacy. Hierarchical multiple regression was also used to assess the degree to which self efficacy moderates the relationship between study skills and academic performance. Table 4 below shows the correlations between subscales of the SSQ and average exam score and self efficacy.
Table 4 above demonstrate the correlations between the various subscales of the study skills questionnaire with the criterion variable (average exam score) and the moderator (academic self efficacy). There is high correlation between average exam score and time management of
r=0.62, with motivation r=0.482, study aids r=0.539, and test strategy r=0.536. Average exam score and information processing have a high correlation of r=0.517, concentration, r=0.366, reading, r=0.253 and writing, r=0.340, (n=288), p<0.01. Correlations between subscales of the SSQ and academic self efficacy are as follows: with time management, r= 0.35, motivation, r= 0.64, study aids, r= 0.472, test strategy, r= 0.478, information processing, r= 0.517, concentration, r=0.556, reading, r= 0.375 and writing at r= 0.234(n=288; p<0.01).

**Table 5. Correlations study skills, academic self efficacy and average exam score at global level**

<table>
<thead>
<tr>
<th></th>
<th>Average exam score</th>
<th>Study skills total</th>
<th>Academic Self efficacy total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson correlation</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study skills</td>
<td>.713</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>Academic Self efficacy</td>
<td>.665</td>
<td>.574</td>
<td>1.000</td>
</tr>
<tr>
<td>Study skills</td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
</tr>
<tr>
<td>Academic Self efficacy</td>
<td>.000</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>Average exam score</td>
<td>288</td>
<td>288</td>
<td>288</td>
</tr>
<tr>
<td>Study skills</td>
<td>288</td>
<td>288</td>
<td>288</td>
</tr>
<tr>
<td>Academic Self efficacy</td>
<td>288</td>
<td>288</td>
<td>288</td>
</tr>
</tbody>
</table>

Table 5 above indicates the Pearson correlations between the predictors and the criterion variable. There is significant positive correlation between study skills and average exam score, r= 0.713. Academic self efficacy and average exam score have a significant positive correlation of r= 0.665. The predictors study skills and academic self efficacy are highly correlated at r= 0.574 (p<0.01)
Figure 2. The model for assessing the moderating effect of self efficacy

![Diagram showing the model for assessing the moderating effect of self efficacy]

The product of study skills and academic self efficacy was obtained in order to assess the level of significance in predicting academic performance.

Table 6. Predictive utility of SSQ and CSSE

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>Change Statistics</th>
<th>Durbin-Watson</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>R Square Change</td>
<td>F Change</td>
</tr>
<tr>
<td>1</td>
<td>.713</td>
<td>.523</td>
<td>.522</td>
<td>7.95397</td>
<td>.525</td>
<td>315.472</td>
</tr>
<tr>
<td>2</td>
<td>.784</td>
<td>.616</td>
<td>.613</td>
<td>7.14447</td>
<td>.093</td>
<td>69.482</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Study skills
b. Predictors: (Constant), Study skills, Academic Self efficacy
c. Dependent Variable: average exam score

Table 6 above shows the degree to which the model predicts the criterion. The R value for model 1 represents the correlation between study skills and average exam score which is pegged at \( r = .713 \). \( R_2 \) which is the degree of variability is in the criterion variable accounted for by study skills is \( R_2 = .523 \). This means study skills account for 52% of variance in academic performance. In model 2 when academic self efficacy is added the variance increases to \( R_2 = .616 \). The adjusted \( R_2 = .613 \) which indicates that the cross validity of the model is very good. The difference between R2 and adjusted R2 is 0.3% which is very small. The Durbin-Watson of 1.961 indicates tenable independent errors. This value is within the acceptable range of greater than 1 and less than 3.
CHAPTER FOUR

4.0 Results

This chapter provides the relationship between the factor structure of the Nigerian study and that of the Zimbabwean study. The degree to which the hypothesis are confirmed is also demonstrated in this chapter.

4.1 Factor structure of the SSQ

The purpose of this study was to establish the factor structure of the Study Skills Questionnaire on a Zimbabwean sample. The first study in sub-Saharan Africa was by Bonanle et al., (2009) who found two latent factors within the SSQ, that is, will and skill after doing exploratory factor analysis. The will factor had three dimensions loading onto it, reading, writing and motivation. The skill component had five components loading onto it. These are information processing, time management, test strategies, concentration and study aids. The current study employed principal component analysis and rotation was done through oblique direct oblimin with Kaiser normalisation as was done in the previous study. Two latent factors were established with eigenvalues greater than, confirming the two factors originally found on a Nigerian sample as indicated in table 7 below. The null hypothesis was confirmed. The scree plot in figure below also confirms the two latent factors obtained. Reading, writing and motivation loaded onto factor one and time management, concentration, study aids, test strategy and information processing loaded onto factor two as shown in table 8 below.
Table 7. Explanation of the variance on the factors extracted

<table>
<thead>
<tr>
<th>Factor</th>
<th>Initial Eigenvalues</th>
<th>Extraction Sums of Squared Loadings</th>
<th>Rotation Sums of Squared Loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>% of Variance</td>
<td>Cumulative %</td>
</tr>
<tr>
<td>1</td>
<td>3.490</td>
<td>43.622</td>
<td>43.622</td>
</tr>
<tr>
<td>2</td>
<td>1.868</td>
<td>23.356</td>
<td>66.978</td>
</tr>
<tr>
<td>3</td>
<td>0.984</td>
<td>12.295</td>
<td>79.273</td>
</tr>
<tr>
<td>4</td>
<td>0.745</td>
<td>9.318</td>
<td>88.591</td>
</tr>
<tr>
<td>5</td>
<td>0.488</td>
<td>6.105</td>
<td>94.696</td>
</tr>
<tr>
<td>6</td>
<td>0.283</td>
<td>3.541</td>
<td>98.236</td>
</tr>
<tr>
<td>7</td>
<td>0.134</td>
<td>1.669</td>
<td>99.906</td>
</tr>
<tr>
<td>8</td>
<td>0.008</td>
<td>0.094</td>
<td>100.000</td>
</tr>
</tbody>
</table>

Extraction Method: Principal component.
Rotation Method: Oblimin with Kaiser Normalisation

Table 7 above indicate a total explanation of the variance attributed to the latent factors within the SSQ. The first two factors have eigenvalues greater than 1 and are more meaningful. Factor 1 and 2 explain 43.6% and 23.3% respectively giving a cumulative total of 66.97%. The extraction sum of squared loadings further confirms the 2 factors extracted.
The scree plot above demonstrates that two factors have been extracted from the analysis. Two factors are well above the bend (point of inflexion) and have eigenvalues above 1 as indicated in the plot above.
Table 8. Factor loadings of the two latent factors

<table>
<thead>
<tr>
<th>Variables</th>
<th>Factor1</th>
<th>Factor2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading</td>
<td>.999</td>
<td></td>
</tr>
<tr>
<td>Motivation</td>
<td>.978</td>
<td></td>
</tr>
<tr>
<td>Writing</td>
<td>.858</td>
<td></td>
</tr>
<tr>
<td>Time management</td>
<td>.999</td>
<td></td>
</tr>
<tr>
<td>Information processing</td>
<td>.994</td>
<td></td>
</tr>
<tr>
<td>Test strategy</td>
<td>.865</td>
<td></td>
</tr>
<tr>
<td>Study aids</td>
<td>.734</td>
<td></td>
</tr>
<tr>
<td>concentration</td>
<td>563</td>
<td></td>
</tr>
</tbody>
</table>

Table 8 above shows the factor loadings of the two latent constructs. Three of the dimensions (reading, writing and motivation) load on to factor 1 and time management, study aids, information processing, concentration and test strategies load on to factor 2.

Table 9. Communality, component, pattern and structure matrix of the subscales of SSQ

<table>
<thead>
<tr>
<th>Variables</th>
<th>Communality</th>
<th>Component matrix</th>
<th>Pattern matrix</th>
<th>Structure matrix</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Factor 1</td>
<td>Factor 2</td>
<td>Factor 1</td>
</tr>
<tr>
<td>Reading</td>
<td>.640</td>
<td></td>
<td>.798</td>
<td>.078</td>
</tr>
<tr>
<td>Study aids</td>
<td>.919</td>
<td></td>
<td>.040</td>
<td>.959</td>
</tr>
<tr>
<td>Test strategy</td>
<td>.450</td>
<td></td>
<td>.096</td>
<td>.667</td>
</tr>
<tr>
<td>Information processing</td>
<td>.929</td>
<td></td>
<td>.031</td>
<td>.964</td>
</tr>
<tr>
<td>Motivation</td>
<td>.717</td>
<td></td>
<td>.847</td>
<td>.036</td>
</tr>
<tr>
<td>Writing</td>
<td>.711</td>
<td></td>
<td>.843</td>
<td>.040</td>
</tr>
<tr>
<td>Concentration</td>
<td>.463</td>
<td></td>
<td>.118</td>
<td>.666</td>
</tr>
<tr>
<td>Time management</td>
<td>.529</td>
<td></td>
<td>.024</td>
<td>.728</td>
</tr>
</tbody>
</table>

Table 9 above displays the component, pattern and the structure matrix of the subscales of the SSQ. The table shows that on all the predicted factors the variables have high factor loadings and are highly correlated.
Results from regression analysis confirm that study skills predict academic performance of students as illustrated by a variance of 52% in table 6 above. Self efficacy also independently predicts academic achievement indicated by the incremental value of 9% illustrated in table 6 above. Table 10 below illustrates subscales of the SSQ as predictors of academic performance.

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>35.147</td>
<td>3.801</td>
<td></td>
<td>9.247</td>
</tr>
<tr>
<td>Gender</td>
<td>-1.623</td>
<td>.963</td>
<td></td>
<td>-1.686</td>
</tr>
<tr>
<td>Age</td>
<td>.484</td>
<td>.587</td>
<td></td>
<td>.825</td>
</tr>
<tr>
<td>department</td>
<td>.283</td>
<td>.318</td>
<td></td>
<td>.888</td>
</tr>
<tr>
<td>Time management</td>
<td>.747</td>
<td>.185</td>
<td>.314</td>
<td>4.031</td>
</tr>
<tr>
<td>motivation</td>
<td>.018</td>
<td>.172</td>
<td>.010</td>
<td>.106</td>
</tr>
<tr>
<td>Study Aids</td>
<td>.061</td>
<td>.140</td>
<td>.030</td>
<td>.438</td>
</tr>
<tr>
<td>Test Strategy</td>
<td>.509</td>
<td>.155</td>
<td>.320</td>
<td>3.288</td>
</tr>
<tr>
<td>Information Processing</td>
<td>.458</td>
<td>.894</td>
<td>.205</td>
<td>.512</td>
</tr>
<tr>
<td>Concentration</td>
<td>.088</td>
<td>.889</td>
<td>.040</td>
<td>.099</td>
</tr>
<tr>
<td>Reading</td>
<td>.154</td>
<td>.142</td>
<td>.065</td>
<td>1.079</td>
</tr>
<tr>
<td>Writing</td>
<td>.124</td>
<td>.144</td>
<td>.054</td>
<td>.860</td>
</tr>
</tbody>
</table>

Time management as a subscale can significantly predict academic performance as indicated by the independent significance (sig=.000). The other subscales can significantly predict but there is shared variance in their predictions (p<0.01).
Table 11. ANOVA display of overall data fit

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>19958.537</td>
<td>1</td>
<td>19958.537</td>
<td>315.472</td>
<td>.000</td>
</tr>
<tr>
<td>Residual</td>
<td>18093.960</td>
<td>286</td>
<td>63.266</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>38052.497</td>
<td>287</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 12. Model parameters

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>T</th>
<th>Sig.</th>
<th>Correlations</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
<td></td>
<td>Tolerance</td>
</tr>
<tr>
<td>1 (Constant)</td>
<td>15.139</td>
<td>3.336</td>
<td>4.538</td>
<td>.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study skills</td>
<td>.340</td>
<td>.019</td>
<td>.724</td>
<td>17.762</td>
<td>.000</td>
<td>.724</td>
</tr>
<tr>
<td>(Constant)</td>
<td>13.860</td>
<td>3.001</td>
<td>4.619</td>
<td>.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Study skills</td>
<td>.237</td>
<td>.021</td>
<td>.505</td>
<td>11.199</td>
<td>.000</td>
<td>.724</td>
</tr>
<tr>
<td>Academic Self efficacy</td>
<td>.741</td>
<td>.089</td>
<td>.376</td>
<td>8.336</td>
<td>.000</td>
<td>.670</td>
</tr>
</tbody>
</table>

The ANOVA table displayed above shows the degree to which the model is a significant fit of the overall data. The last column of the table shows the significant level, (indicated by sig) of less than 0.05 which indicates the best fit of the regression model. The $F$-ratio for the first model is $315.472$ which is very unlikely to have happened by chance. For model 2 the $F$-ratio is $230.246$. The $F$-ratio for model 2 is less than that for the first model because the percentage increase of the second predictor is less than the variability of the first predictor.
Table 12 above demonstrate the parameters of the model. The positive $b$-values confirm a positive relationship between the predictors and the criterion. If study skills increases by 1 unit then average exam score increases by 0.23 all other factors held constant. Positive $b$-values indicate a positive relationship and negative values indicate negative relationships.

4.2 Moderating role of self efficacy

The interaction of the predictors was done and the results are illustrated below in table 13. The centrality of study skills and self efficacy and also the product of the two predictors was computed and run into regression as demonstrated below. Study skills $\times$ academic self efficacy significantly predicted giving $\text{sig F change}$ of .000. This illustrates that self efficacy moderates the relationship between study skills and academic achievement. Hypothesis 2 was confirmed.

Table 13 Interaction between study skills and self efficacy

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>Change Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>R Square Change</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F Change</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>df1   df2</td>
</tr>
<tr>
<td>1</td>
<td>.569$^a$</td>
<td>.324</td>
<td>.319</td>
<td>8.3073</td>
<td>.324</td>
</tr>
<tr>
<td>2</td>
<td>.625$^b$</td>
<td>.391</td>
<td>.384</td>
<td>7.90045</td>
<td>.067</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), centrality study skills, centrality self efficacy

b. Predictors: (Constant), centrality study skills, centrality self efficacy, study skills $\times$ academic self efficacy
Figure 4 below illustrates the graphical interaction of study skills and academic achievement. The positive beta values less than 0.005 indicate the presence of an interaction.

Figure 4 Interaction plot of study skills and self efficacy

![Interaction plot of study skills and self efficacy](image)

Of the plot above the beta value for the simple slope of high level of self efficacy is $\beta = 0.344$, for the simple slope of medium level self efficacy the beta value is $\beta = 0.225$ and for the simple slope of low level self efficacy the beta value is $\beta = 0.106$, $p < .05$ for all the slopes. These values demonstrate the existence of an interaction.

4.3 Chapter summary

Chapter four provides results of the study. It gives the factor structure of the Nigerian sample and the similarity with the Zimbabwean sample. The interaction between study skills and self efficacy is also given.
CHAPTER FIVE

5.0 Discussion

5.1 Study skills

This is the first study in Zimbabwe to look into the factor structure and psychometric properties of the study skills questionnaire and the moderating role of self efficacy among university students. The process of administering the SSQ is easy and it is a self report questionnaire. Though as a self report questionnaire, it has its own weakness of self serving bias efforts were made to ensure anonymity through making sure their names were not indicated. This instrument will assist students who would want to benefit from educational interventions through identifying areas they may need to improve and then working towards improving those areas.

In relation to the factor structure of the SSQ the results from the local study indicates that there are similar factors in Zimbabwe as those from West Africa (Nigeria) where the instrument was standardised by Bonanle et al., (2009). Following the same procedure as they did in their exploratory factor analysis, the two factors were established. The various dimensions loaded into the factors in the same manner as they did with the Nigerian sample. In other words the factor structure between the two samples (Zimbabwean and Nigerian) is the same. This implies that for use in Zimbabwe there is no need to alter the nature of the SSQ since it shows that the same study skills that were assessed with the instrument when it was standardised are the same skills that are being measured in the local context. However there is need to employ various rotations in order to establish how the instrument will behave. Efforts should be made to assess the whole instrument as a single entity instead of focussing on the individual dimensions.

In terms of predictive utility, the results from this study indicate that the study skills are an important predictor of academic achievement to a greater extent. Time management has proved to be an independent predictor of academic performance as found by Britton and Tesser (1991) who said that in terms of the relationship between specific study skills and
academic achievement time management can predict the grand point average and the quality of academic performance. Other study skills like study aids, information processing and test strategy also had high positive correlations (of 0.539, 0.517 and 0.536) respectively with the average exam score which confirms that they play a significant role in student performance. Most of the study skills moderately predict academic performance; in fact they do so in terms of shared variance as indicated by the results from regression analysis which shows significance levels of greater than .000. However as a holistic instrument the study skills questionnaire can to a greater extent predict academic achievement.

5.2 Self efficacy

Self efficacy on the same hand has proved to be an important component in as far as academic performance is concerned. Results from this study shown that self efficacy should not be taken for granted when assessing critical factors affecting academic achievement. An incremental value of 9% as demonstrated by results from regression analysis is very significant in influencing student performance. Parajes and Kranzler (1995) although they focused on mathematics self efficacy, they found it to highly predict achievement outcomes. This implies that when teaching study skills to students’ efforts must also be made to improve their efficacy beliefs. The high correlation of $r=0.547$ between self efficacy and study skills indicates the interaction of the two factors. The results of this study by adding self efficacy have added more information in the domain of learning since its moderating role should be attended in order to get maximum benefit from the interventions.

5.3 Limitations of the study and directions for future research

Even though the study confirmed the predictive utility of SSQ and self efficacy in academic performance, it is still haunted by the fact that they are self report questionnaires which gives much room to the respondent to answer in any way they seem like. Given the bigger number of the subjects involved in the process, chances are high that some of the subjects got clues from their fellow students which to some extent may have distorted the responses. However efforts were made during debriefing for them to try to be as sincere as possible in their responses and also not to indicate their names. Also of concern is validity evidence of the instrument. Future studies should make efforts to establish the validity evidence of the SSQ.
It is a very reliable instrument but meta-analyses should be done to establish the validity of the SSQ. Future research should also try to increase the scope and broaden the spectrum of study by way of increasing the number of factors that come into play. Efforts should also be made to do confirmatory factor analysis as a way of assessing model fit.

5.4 Conclusion

Excellence marks success in most activities and academic excellence is not an exception. Study skills as has been found in the literature and further confirmed in this study are a critical aspect in academic performance. They should be taught in areas they are a deficiency so as to maximise effort. Students can benefit much especially if their areas of weakness are identified and effort is exerted towards that. In the same hand self efficacy beliefs also add value to academic excellence. These beliefs need to be harnessed with study skills in order to get maximum benefit. Resultantly they should be used concurrently since they have an interaction.


Appendix 1

STUDY SKILLS QUESTIONNAIRE

My name is Gwamanda Nelson. I am a Master of Occupational Psychology student in my final semester and carrying out a research on the level of study skills amongst first year Psychology students at the University of Zimbabwe. This information can be used to help identify areas of strength and potential change, so be as open as possible. The information will be used strictly for academic purposes and will remain confidential. May you please respond to each statement on a 4 point scale to best reflect what you actually do or have done as a student. Please be advised that participation is voluntary.

<table>
<thead>
<tr>
<th>Scale: 1= Never</th>
<th>2= Sometimes</th>
<th>3= Usually</th>
<th>4= Always</th>
</tr>
</thead>
</table>

**Gender …………………… Student Number……………… Tutori al group……………..**

**TIME MANAGEMENT**

1. I arrive at classes and other meetings on time. 1 2 3 4
2. I devote sufficient study time to each of my subjects. 1 2 3 4
3. I schedule definite times and outline specific goals for my study time. 1 2 3 4
4. I prepare a study plan for everyday. 1 2 3 4
5. I avoid activities which tend to interfere with my planned schedule. 1 2 3 4
6. I study when I am most alert. 1 2 3 4
7. At the beginning of the semester, I make up daily activity and study schedules. 1 2 3 4
8. I do my assignments well in advance. 1 2 3 4

**CONCENTRATION**

1. I have a habit of studying at the same place. 1 2 3 4
2. I study in a place free from auditory and visual distractions. 1 2 3 4
3. I find that I am able to concentrate – that is, give undivided attention to the task for at least 20 minutes. 1 2 3 4
4. I am confident with the level of concentration I am able to maintain. 1 2 3 4
5. I have an accurate understanding of the material I wish to remember. 1 2 3 4
6. I learn with the intention of remembering. 1 2 3 4
7. I practice the materials I am learning by reciting out loud. 1 2 3 4
8. I recall readily those things which I have studied. 1 2 3 4

**STUDY AIDS**

1. While I am taking notes, I think about how I will use them later. 1 2 3 4
2. I understand the lecture and classroom discussion while I am taking notes. 1 2 3 4
3. I organize my notes in some meaningful manner (such as outline format). 1 2 3 4
4. I review and edit my notes systematically. 1 2 3 4
5. I always make notes from books other than the recommended textbooks to help understand my subjects. 1 2 3 4
6. I utilize internet and library resources effectively 1 2 3 4
7. When reading, I mark or underline parts I think are important. 1 2 3 4
8. I write notes in the book while I read. 1 2 3 4

**TEST STRATEGIES**

1. I try to find out what the exam will cover and how the exam is to be graded. 1 2 3 4
2. I feel confident that I am prepared for the exam. 1 2 3 4
3. I try to imagine possible test questions during my preparation for an exam. 1 2 3 4
4. I take time to understand the exam questions before starting to answer. 1 2 3 4
5. I follow instructions carefully when taking an exam. 1 2 3 4
6. I usually get a good night’s rest prior to a scheduled exam.  
7. I am calmly able to recall what I know during an exam.  
8. I understand the structure of different types of tests and am able to prepare for each type.

INFORMATION PROCESSING
1. When reading, I can distinguish readily between important and unimportant points.  
2. I break assignments into manageable parts.  
3. I maintain a critical attitude during my study, thinking before accepting or rejecting.  
4. I relate material learned in one subject to materials of other subjects.  
5. I try to organize facts in a systematic way.  
6. I use questions to better organize and understand the material I am studying.  
7. I try to find the best method to do a given job.  
8. I solve a problem by focusing on its main point.

MOTIVATION
1. I sit near the front of the class if possible.  
2. I am alert in classes.  
3. I ask the teacher questions when clarification is needed.  
4. I volunteer answers to questions posed by teachers in the class.  
5. I participate in meaningful class discussions.  
6. I attend class regularly.  
7. I take the initiative in group activities.  
8. I use a study method, which helps me develop an interest in the material to be studied.

READING
1. I survey each chapter before I begin reading  
2. I follow the writer’s organization to increase meaning.  
3. I review reading material several times during the term.  
4. When learning a unit of material, I summarize it in my words.  
5. I am comfortable with my reading rate.  
6. I look up parts I don’t understand.  
7. I am satisfied with my reading ability.  
8. I focus on the main point while reading.

WRITING
1. I find that I am able to express my thoughts well in writing.  
2. I write rough drafts quickly and spontaneously from notes.  
3. I put aside a written assignment for a day or so, then rewrite it.  
4. I review my writing for grammatical errors.  
5. I have someone else read my written work and consider their suggestions for improved writing.  
6. I am comfortable using library sources for assignments.  
7. I am able to narrow a topic for an essay, etc.  
8. I allow sufficient time to collect information, organize material, and write the assignment.
Appendix 2

COLLEGE STUDENT SELF EFFICACY OPINIONNAIRE

Instructions: Please read each statement below carefully and indicate how much you agree or disagree with each statement by marking your answer according to the 4 point key below. Mark your answer by completely filling in one and only one circle on the answer sheet.

1 = Strongly Disagree  2 = Disagree  3 = Agree  4 = Strongly Agree

1. Even when I make a disappointing grade I am able to study hard for the next exam.  
   1 2 3 4

2. Even if I fail a few courses, I will persist until I get my bachelor’s degree.  
   1 2 3 4

3. I prefer class work that is challenging so I can learn new things.  
   1 2 3 4

4. I am able to overcome financial difficulties while in college.  
   1 2 3 4

5. Even when study materials are dull and uninteresting, I keep working until I finish.  
   1 2 3 4

6. I am able to persistently work at my career goal even when I get frustrated.  
   1 2 3 4

7. I am able to organize my activities so that I can meet all course deadlines.  
   1 2 3 4

8. Soon after the end of a lesson, I am able to remember all of the key concepts.  
   1 2 3 4

9. I can understand all of the key concepts covered in my course.  
   1 2 3 4

10. When I am confronted with a problem, I can usually find several solutions.  
    1 2 3 4
Appendix 3

CONSENT FORM

I………………………………… Freely and voluntarily agree to participate in the research titled “The factor structure and psychometric properties of the study skills questionnaire and the moderating role of self efficacy in academic performance”. I understand that I will respond to the questionnaire. I further understand that refusal to participate or withdrawal from the study when I feel like will not involve any penalties or loss of benefits to which I am entitled to. I also understand that my confidentiality and anonymity will be guaranteed.

The aims of the study have been explained to me and I have read and understood the contents of the project.

Signature of participant  Researcher’s signature  Witness

…………………………  ……………………………  …………