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SELF-REGULATORY STRATEGIES AND EXTRINSIC MOTIVATION AS PREDICTORS OF EFFECTIVE LEARNING OF STATISTICS AMONG UNDERGRADUATE STUDENTS

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Abstract

This study employs descriptive correlational design to determine whether self-regulatory strategies and extrinsic motivation can predict effective learning of statistics among undergraduate students. The study's population sample consists of the second year undergraduate students in five departments of FCE, Okene, Kogi State, Nigeria: an affiliate of University of Ibadan, offering Statistics in Education. Simple random sampling was used in selecting the sample size of 200 across the five departments.One research instrument consisted ofstudents' self-regulatory strategies (SSRS) and students' extrinsic motivation (SEM); and one constructed academic performance proforma were used for the

study. The reliability was obtained through crombach alpha coefficients of 0.85 and 0.78 respectively. Data collected was analyzed using regression analysis, pearsonproduct moment correlation and correlational matrix. The study's results show that self-regulatory strategies and extrinsic motivation have the ability to improve students' academic performance, and revealed more to academic performance of students taking statistics.

Keywords: Self-regulation, self-regulatory strategies, extrinsic motivation, statistics.

Introduction

Education is seen by the Federal Republic of Nigeria in her Education Policy as an instrument par excellence in affecting national development of the country. According to Lawer, Isaac, Seth and Nashiru (2016), education is the second item on the Millennium Development Goals and a key priority of every government, and the most important investment a country can make in its people for better development. Through education activities offered in schools, the students are expected to acquire technical and vocational skills that are necessary for economic development. Also, the school, through its teachers is required to develop and promote a desire in the students for self-improvement, self-reliance, self-esteem e.t.c. These could be achieved by teachers exposing the students to self-regulation and metacognitive process of learning.

Self-regulation refers to one's ability to understand and control his/herlearning environment. This ability involves goal setting, self-monitoring, self-instruction, and self-reinforcement (Dignath and Buttner, 2018). Self-regulation should not be confused with a mental ability or an academic performance skill. Instead, self-regulation is a self-directive process and set of behaviors, whereby learners transform their mental abilities into skills and habits

through a developmental process that emerges from guided practice and feedback (Msayar and Akhmal, 2016).

It is the feelings, thoughts and behaviors that an individual develops on his or her own so as to achieve a setobjective.Dignath and Buttner (2018)opined it as the processes by which people regulate their thoughts, emotions, attention, behaviour and impulses. People generate thoughts, feelings and actions and adapt those to the attainment of personal goals.Therefore, it is a process managed by the individual in transforming his or her mental abilities into academic skills. According to Pajares (2008), self- regulation is a metacognitive process where students understand and evaluate how they behave as well as plan alternative routes to success; and Dignath and Buttner (2018), stressed that, self-regulation is to produce thoughts and emotions which are necessary for learning and motivation of an individual, to plan his or her behaviors based on these thoughts and emotions and to achieve them gradually. It can be stated that the individuals with self-regulation skills are aware of their responsibilities, active and constructive in the learning process and can regulate their objectives, easily get their act together, rivet their attention and maintain their attention span.

Self-regulatory is significant because the purpose of education is to enhance lifelong learning skills. After graduating from high school or university, young adults can learn very important abilities through unofficial ways (Zimmerman, 2008). Self-regulatory includes strategic performance adjusting processes and self-monitoring (Zimmerman, 2010).

Behavioural self-regulation involves self-observing and strategically adjusting performance processes, such as one's method of learning (Msayar and Akhmal, 2016). Individuals regulate their own functioning in order to achieve goals or change how they are thinking. The self-regulation of cognition and behaviour are important aspects of learning and the extent to which school students become self-regulators of their own learning influences their academic success (Zimmerman, 2008; Zimmerman andSchunk, 2011).

Furthermore, Msayar and Akhmal, (2016) have suggested a four stage process. In the first stage, learners acquire self-regulatory skills and strategies most rapidly from social sources such as observing the processes being modelled, verbal descriptions and social guidance, and feedback. An imitative level of self-regulatory competence is reached when the learner's performance emulates that of the observed model. The internalization of the strategy is the next stage and is apparent through the ability of the learner to use the strategy independently. Someone's actions and mental processes depend on one's beliefs and motives. According to Soleymani and Rekabdar (2016), life in today's modern and complicated world requires creative thoughts and dynamic ideas. They further observed that learning Mathematics effectively promote these qualities. In recent decades, the study of effective parameters in learning Mathematics has attracted the attentionof scientists in the field of education. Research results (Bartels and Magun-Jackson, 2009) have shown that understanding Mathematics, statistics and other related analyticssubjects not only depends on cognitive structures, but also on motivational and emotional factors such as belief, attitudes and anxiety. Self-regulation is related to intrinsic motivation in many ways as it concerns with its strategies and outcomes such as self-concept, self-reliance, self-esteem etc.

Self-regulatory strategies consist of a combination of different methods, aimed at letting the students take control of their own learning process by thinking about what, and how to learn, for example, by self-assessing, becoming aware of intended learning outcomes, conducting metacognitive reflections, and monitoring the learning process (Sautelle, Bowles, Hattie, and Arifin, 2015).

Ramdass and Zimmerman (2011) identified specifically, three components of self-regulation: cognition, metacognition, and motivation. The cognition component includes the skills and habits that are necessary to encode, memorize, and recall information as well as think critically. Within the metacognition component are skills that enable learners to understand and monitor their cognitive processes. The motivation component portrays the

beliefs and attitudes that affect the use and development of both the cognitive and metacognitive skills. They added that metacognition is sub-divided into three components as metacognitive knowledge, metacognitive experience, and metacognitive strategies.

Dignath and Buttner (2018) explicitly points out the role of motivation as essential factor in self-regulation strategies, claiming that without motivation to achieve a valuable outcome, self-regulation is impossible, and according to Rieser,Naumann, Decristan, Fauth, Klieme, andButtner, (2016), more motivated students tend to use self-regulation strategies to greater extents than less motivated students. Effectively, self-regulation strategy is based on a number of different strategies, such as metacognitive thinking, self-assessing, self-monitoring (learning process), and the understanding of intended learning outcomes, to make the learner steer emotionally, cognitively and motivationally towards achieving a goal (Sautelle et al., 2015). Msayar and Akhmal, (2016) connect motivation, self-regulation and emotions as codependent and equally cognitively necessary, in learning of statistics.

From a strictly biological point of view, motivation is goal-oriented/needs-driven behavior through neurological activities as influenced by biological (for instance, hormonal) & psychological factors, experiences, and contextual settings, that produce specific responses under different circumstances (Simpson and Balsam, 2016). Essentially, motivation as it occurs in the brain is a very complex process that involves several different biological systems in order to be explained (Simpson and Balsam, 2016). In other words, although motivation potentially can be steered towards reaching certain goals as proposed by self-regulation strategies, it is a phenomenon far too complex to simply "control" or get access to.

Motivation is a dynamic and temporary situation which should be separated from personality or emotion. Motivation is the desire and interest to do something. According to Kulwinder (2011):

One of the most important factors that lead one to their goals is the drive. This drive is known as motivation. It is a zest and determination with a kind of excitement that leads one to persevere to reach greater heights, in no matter what avenue of their life; be it – personal or professional. The drive may come from an internal or external source. The individual determines this. The factors that motivate an individual keep changing as one climbs the ladder of age and maturity. And also, achievement of one goal sets the ball rolling for another one to be achieved. Thus, to be motivated is a constant need. There are times when one faces a period of de-motivation and everything seems bleak. It is then that they need to find what would motivate them back into action. (Kulwinder, 2011)

Therefore, motivation is the activation of goal-oriented behavior. It is said to be intrinsic or extrinsic.Intrinsic Motivation refers to motivation that is driven by an interest or enjoyment in the task itself, and exists within the individual rather than relying on any external pressure. Intrinsic motivation has been studied by social and educational psychologists since the early 1970s. Research has found that it is usually associated with high educational achievement and an output of effective self-regulatory strategies of the students. That is why Kulwinder, (2011) referred self-regulation strategies as an intrinsic motivation.

According to Marilyn, Linda and Tamera (2003), there are three subcategories of intrinsic motivation: Firstly, intrinsic knowledge, or feeling of satisfaction of gaining knowledge. Secondly, intrinsic accomplishment, or feeling of fulfillment by achieving something.And third, intrinsic stimulation, or doing something because it is enjoyable.Msayar and Akhmal, (2016) have found that students' intrinsic motivation for doing school work is derived from a mix of reasons, such as interest, level of fun, and enjoyment. Finally, according to Ortega (2009), due to the inherent and subconscious nature of intrinsic motivation, high levels of learner autonomy are a prerequisite for achieving high levels of intrinsic motivation. Intrinsic motivation is a source that is central to the nature of the

organism. Intrinsic motivation depends on the innate need for competence and self-determination. It provides the fuel for various behaviors and psychological processes. Intrinsic needs are different from primary drives because they are not based in tissue deficits and they do not function cyclically. However, both of them are innate and provide an energy source for behavior. In addition, intrinsic motivation can increase or decrease the intensity of drives and also influence the way one satisfies his/her drives (Kulwinder, 2011).

Extrinsic motivation is conventionally defined as motivation originating from an external factor or outcome, such as a reward or a punishment (Marilyn et al, 2003)). According to self-determination theory, extrinsic motivation can be placed on a continuum depending on how much the external motivational factors have been internalized. He went further to expressing the procedure as follow: the first step is external regulation, in which the motivation is completely dependent on getting an external reward for doing something. In the second step, introjected regulation, the orientation is still governed by external regulation; however, the individual has internalized the purpose of doing something.Kulwinder (2011) stressed that:

Introjected regulation refers to an internalized external regulation but which is not truly accepted as one's own. It is some form of partially internalized extrinsic motivation. It is a type of internalized regulation that is very controlling. Introjection-based behaviors are performed in order to avoid guilt or to produce ego enhancements and feelings of worthiness. This type of regulation depends on contingent self-esteem.(Kulwinder, 2011).

During the third step, identified regulation, a person might be motivated to do something not for the value in itself, but for another purpose, such as learning to drive better in order to help someone else. In the last step, the extrinsic motivational factors become completely embraced by the self, and a person does something, neither for the rewards nor enjoyment, but rather, for

the inherent and acknowledged value of doing it, and although not intrinsic motivation in itself, it resembles it.

There is a significant relationship between motivation, self-regulation and academic achievement (Mahmoodi, Kalantarib andGhaslanic, 2014). Past literatures view it as thus:motivational control and the process of regulation lead to positive conditioned results on academic performance (Schunk, 2005). Self-regulation learning is related to motivation (Schunk andErtmer, 2010; Pintrich, 2010; Zimmerman, 2010). Self-regulation increases learning and maintains motivation (Schunk andErtmer, 2010). Ekhlas and Shangarffam (2013) found correlations between academic self-regulated strategies and reading, writing, speaking, listening, and language experience. Though, Heikkilä and Lonka (2006) detected a low positive relationship between academic average and self-regulated learning; Marilyn et al (2003) found a weak correlation between aptitude and achievement, accounting for only 52% of the variance in academic achievement; and Barış (2015) showed in his work that there was no correlation between GPA and academic motivation and academic self-regulation learning. In other words, the students' academic motivation and academic self-regulated learning total scores, together, did not predict their GPA.Msayar and Akhmal, (2016) determined that self- regulated learning and motivation had positive effects on academic achievement.

Academic achievement orperformance is the extent at which a student, teacher or institution has achieved their long-term educational goals. Cumulative GP and completion of educational benchmarks such as secondary school, diplomas and bachelor's degrees represent academic achievement. It is commonly measured through examinations or continuous assessments.Students' academic achievement in higher education is attained through effective learning; and learning is the process of acquiring new knowledge, behaviours, skills, values, attitudes and preferences which are also obtainable in statistics.

Statistics is the discipline that concerns the collection, organization, analysis, interpretation and presentation of data. It deals with every aspect of data, including the planning of data collection in terms of the surveydesign and experiments. For example, when collecting census data using traditional methods become challenging, statisticians develop specific designs and survey samples to collect data. Representative sampling assures that inferences and conclusions can reasonably extend from sample to the population as a whole. It is a crucial process behind how we make discoveries in science, make decisions based on data, as well as predictions. It is also a field of study that paves way for the comprehension of other subjects or courses much more deeply. It keeps us informed about, what is happening in the world around us especially these days the world cannot live without information and much of these information are determined mathematically usingstatistical approach. Therefore, to be informed, correct data and statistical concepts are necessary.

Despite all the emphasis laid on Statistics, performances in the subject have remained consistently low among undergraduate students of Nigeria higher institutions. Its teaching and learning has become illusive, where majority of the students have been entertaining fear over the learning of the subject as it might be associated with lack of motivation and self-regulatory strategies. This causes tremendous consequences on the students' understanding, learning and performance.

This therefore, instigated the researchers to investigate on self-regulatory strategies and extrinsic motivation as factors that can predict learning of statisticsamong undergraduate students of Federal College of Education, Okene, Kogi state, an affiliate of University of Ibadan, Nigeria.

Statement of the problem

Poor performance of students in statistics among undergraduates are of serious concern to the government and parents, especially when compared

against the resources spent each year in training and retraining of teachers. The use of various approaches and strategies in teaching statistics would have no doubt solved the problem of poor performance in the subject;yet, no meaningful solutions have been reached to curb poor performance in statistics among undergraduates especially, in Federal College of Education, Okene, Kogi state, Nigeria. It can be observedthat the same teachers who produced the best students are also accused of those that failed. This shows that there are other factors apart from the teachers' effect that can be attributed to the students themselves.

However, several studies have tried correlating the effects of various psychological and social variables such as emotional intelligence, self-esteem, learner autonomy, achievement motivation, among others on students' academic performance. The results from these studies have shown to varyamong different individuals, thus,there are still grey areas in understanding the possible strategies of self-regulation on learning of Statistics among undergraduate students in Nigeria**.**

Purpose of the study

The main purpose of the study is to investigate self-regulatory strategies and extrinsic motivations as predicting variables to the learning of statistics among undergraduate students of Federal College of Education, Okene, Kogi state, Nigeria. In addition, this studywill investigate the extent and direction of the relationship as well as the combined and relative predictive impact of self-regulation and motivation on students' academic performance in statistics.

Research Questions

1. To what extent do the following four self-regulatory strategies correlate with learning of statistics, (self-assessment, knowledge of intended learning outcomes, setting and achieving goals, and self-monitoring)?

2. To what extent does the level of extrinsic motivation correlate with learning of statistics?

3. What is the combined and relative predictive impact of self-regulation and motivation on students' academic performance in statistics?

Method

This study adopted descriptive correlational research design with the aim of investigating self-regulatory strategies and extrinsic motivation as predicting variables to effective learning of statistics among undergraduate students.The population of the study consist of all the second year undergraduate students of five departments in the Federal College of Education, Okene, Kogi state, Nigeria, who took statistics course in education. Simple random sampling technique was adopted to select participants for the study. Out of 5 departments, 40 students were selected from each of the department, making the total participants to be 200 students. One research instrument and one constructed academic performance proformais used for the study. The research instrument used consisted of two sections: the first section consists of student self-regulatory strategies (SSRS) which is made up of four other sub-sections that measured student's self-assessment, knowledge of intended learning outcomes, setting and achieving goals, and self-monitoring; the second section includes indicators of student's extrinsic motivation(SEM) as it relates to learning of statistics. The first section of the instrument is made up of 20 items scale, while the second section is 10 items scale. The validity of the instruments was obtained through experts in test and measurements in the department of educational psychology, Federal College of Education Okene, Kogi State of Nigeria,and the reliability using Crombach alpha with coefficients of 0.85 and 0.78 respectively. The academic performance proforma was use to collect the results of the studentsafter their 2018/2019 second semester examinationin statistic.Data collected was analyzed using regression analysis, Pearson Product Moment Correlation and correlational

matrix. All statistical analysis was performed using SPSS software (version 23.0). The statistical significance was determined as $p<0.5$.

Results

Table 1:Summary analysis of mean scores and standard deviation on the four student self-regulatorystrategies.

Self-regulatory strategies	**Self-assessment**	**Knowledgeof intended learning outcomes**	**Setting and achieving goals**	**Self-monitoring**
Mean	10.0	13.82	14.75	15.20
Standard deviation	5.32	6.66	5.00	5.00

Table 1 shows the mean and standard deviation of students' response to the four self-regulatory strategies(self-assessment, knowledge of intended learning outcomes, setting and achieving goals, and self-monitoring) and the extent they correlate with learning of statistics. Self-monitoring has the highest mean value of 15.20 with SD value of 5.00, setting and achieving goals has the mean value of 14.75 and SD value of 5.00, while knowledge of intended learning outcomes and self-assessment has the means values of 13.82 and 10.70, and SD values of 6.66 and 5.32 respectively.

Table 2:Correlation matrix of the four Self-Regulatory Strategies andAcademic Performance of student in Statistics

Self-Regulatory Strategies	SA	KILO	SAG	SM
Self-Assessment (SA)				
Knowledge of Intended Learning Outcomes (KILO)	0.413**			

Setting and Achieving Goals (SAG)	0.311**	0.257**	0.564**	
Self-Monitoring (SM)	0.456**	0.457**	0.325**	
Academic Performance in Statistics (APS)	0.425**	0.698**	0.524**	0.660**

Note ** Correlation is significant at the 0.01 level (2-tailed).

In order to find the extent which, the four self-regulation strategies correlate with learning of statistics, Pearson correlation coefficient was calculated. The results of this analysis are shown in Table 2. These results show that there is a positive and significant Correlation between all research variables, at 0.01 level, and indicate that the group is coherent. Academic performance and Knowledge of Intended Learning.

Outcomes are related the most ($r = .698$, $p < 0.01$), while Self-Monitoring and Setting and Achieving Goals correlate with Academic Performance in Statistics at ($r = 0.660$, $p < 0.01$) and ($r = 0.524$, $p < 0.01$) respectively. Out of the four self-regulation strategies, self-assessment is the least connected to academic performance ($r = 0.425$, $p < 0.01$). Based on the results of this analysis, the four self-regulatorystrategies correlate positively and significant with the academic performance of student in statistic. This implies that as the four self-regulatorystrategies increases the academic performance of student in statistic also increases.

Table 3:Pearson Correlation showing the relationship between extrinsic motivation and academic performance of students in statistics

Variables	**N**	**r-cal**	**r-tab**
Extrinsic motivation	200	0.833	0.195
Academic performance in statistics	200		

P< 0.05 (significant Result)

In order to test for relationship among the two variables, correlation analysis was carried out to determine such relationship using Pearson Correlation method. As presented in Table 3,it can be observedthat there is a strong positive relationship between extrinsic motivation and academic performance of students in statistics ($r=0.833$, $p< 0.5$). This shows that both extrinsic motivation and academic performance of students in statistics were tending towards the same direction. As extrinsic motivation increases positively, academic performance of the student follows the same pattern of increase.

Table 4: The combined and relative predictive impact of self-regulation and motivation on students' academic performance in statistics.

Regression analysis

Model	β	t-value	Significance	Model R square (R^2)
self-regulation	0.708	0.540	0.000	0.56
Extrinsic Motivation	0.322	0.496	0.000	

In order to test for combined and relative predictive impact of self-regulation and motivation on students' academic performance in statistics, multiple regression analysis was carried out to determine such relationship as presented in Table 4.From Table 4,it is observed that the independent variables when combined together had significant effect on the academic performance of the respondents. The value of R^2 is 0.56. The implication of this finding suggeststhat the combined influence of the two independent variables accounted for 56% of the total variance in academic performance. This percentage also implies that there were other factors not included in this study that can also influence academic performance.

However, each of the independent variables made a significant contribution to the prediction of academic performance. Considering the extent

of their contribution, self-regulation made the most significant contribution (Beta=0.708, t= 5.40, $p<0.05$) to the prediction. Extrinsic motivation made positive significant contribution (Beta =0.322, t = 4.96, $p<0.05$) to the prediction.

Discussion

This research investigated the Self-regulatory strategies and extrinsic motivation as predictors of effective learning of statistics among undergraduate students. According to result from this study the four self-regulation strategies; self-assessment, knowledge of intended learning outcomes, setting and achieving goals, and self-monitoring correlates highly and positively with the academic performance of students in statistics. This shows that self-regulation strategies are important aspects of learning statistics among students; and that the extent to which school students become self-regulators of their own learning influences their academic success, and increases learning. This agrees with the findings of Mahmoodi, Kalantarib and Ghaslanic(2014),which showed a significant relationship between self-regulation and academic achievement. Though, Heikkilä and Lonka (2006) detected a low positive relationship between academic average and self-regulated learning.

The correlation coefficient ($r=0.833$, $p< 0.5$) as presented in Table 3 showed that there is a strong positive relationship between extrinsic motivation and academic performance of students in statistics. This suggeststhat the more students are motivated, the more they perform better in their academic work. In other words, the higher their motivation, the higher their academic performance. This finding agreed with that of Msayar and Akhmal (2016), determined that self-regulated learning and motivation had positive effects on academic achievement.

The regression analysis indicated that the independent variables when combined together had significant effect on the academic performance of the respondents. The value of R^2 is 0.56, this implies that the combined influence of

the two independent variables accounted for 56% of the total variance in academic performance. Each of the independent variables made a significant contribution to the prediction of academic performance. Considering the extent of their contribution, self-regulation made the most significant contribution (Beta=0.708, t=5.40, p<0.05) to the prediction, while extrinsic motivation made positive significant contribution (Beta=0.322, t=4.96, p<0.05) to the prediction. These suggest that self-regulation and extrinsic motivation had the capacity of predicting academic performance. This finding is in line with (Schunk and Ertmer, 2010), who determined that self- regulation and motivation had positive effects on academic achievement. Ekhlas and Shangarffam (2013) also found correlations between academic self-regulated strategies and reading, writing, speaking, listening, and language experience.

Conclusion

Base on the finding of this study, the following conclusions were arrived at; self-regulatory strategies (self-assessment, knowledge of intended learning outcomes, setting and achieving goals, and self-monitoring) has the ability to improve students' academic performance and revealed more about academic performance of students in statistics.

Extrinsic motivation has a positive contribution to the improvement of academic performance of students in statistics. That is, students when motivated can perform better in their academic pursuit.

Recommendations

It is then recommended that self-regulation strategies (self-assessment, knowledge of intended learning outcomes, setting and achieving goals, and self-monitoring) should be among the various approaches and strategies use in teaching statistics as well as other related courses. This would have no doubt in solving the problem of poor performance in the subject.

Research should be conducted on the possible effect of some of these self-regulatory attributes namely (emotional intelligence, self-esteem, self-efficacy, achievement motivation, learner autonomy and academic procrastination), as well as relate or differentiate it with self-regulatory strategies on learning of statistics among undergraduate students in Nigeria**.**

Students should always be motivated to improve in their academic pursuit, since one of the most important factors that lead one to their goals is the drive and this drive is known as motivation.

Moreover, these factors (self-regulatory strategies and extrinsic motivation) should be brought down to lower educational levels (primary and secondary schools), since they are the foundingstones of higher education.

REFERENCES

Barış C., (2015). Academic Motivation and Self-Regulated Learning in Predicting Academic Achievement in College.*Journal of International Education Research, Turkey. 11 (2),* 101-102

Bartels, J. M., &Magun-Jackson, S. (2009). *Approach-avoidance motivation and meta-cognitive self-regulation:* The role of need for achievement and fear of failure. Learning and Individual Differences, 19, 459-463.

Dignath, C. &Buttner, G., (2018).Teachers' direct and indirect promotion of self-regulatedlearning in primary and secondary school mathematics classes:Insights from video-basedclassroom observations and teacher interviews. *Metacognition Learning.*13(2), 127-157.

Ekhlas, N.N., &Shangarffam, N. (2013).The relationship between determinant factors of self-regulation strategies and main language skills and overall proficiency.*Procedia-Social and Behavioral Sciences*, 70, 137 – 147.

Kulwinder, (2011).Study of Achievement Motivation in Relation to Academic Achievement of Students.*International Journal of Educational Planning & Administration Rajasthan, India.*2 (1), 161-171

Lawer, P. K., Isaac, A. A., Seth, A. A., &Nashiru, N. K. A. (2016). Effective classroom management, self-esteem and academic achievement of Dormaa senior high school Ghana.*International Journal of Social Science and Humanities Research,* 4(1), 292- 299.

Mahmoodi, M.H., Kalantarib, B., &Ghaslanic, R. (2014).Self-Regulated Learning (SRL), Motivation and Language Achievement of Iranian EFL Learners.*Procedia - Social and Behavioral Sciences 98,* 1062–1068.doi:10.1016/j.sbspro.2014.03.517.

Marilyn R., Linda G., & Tamera M. (2003).*Aptitude, Motivation, and Self-regulation as Predictors of Achievement among Developmental College Students.*Research and Teaching in Developmental Education Vol. 20 (1), 5-21

Msayar, H., &Akhmal, R., (2016). The relationship between test anxiety and academic self-regulated learning among foundation students in Lium.*Science Journal of Education,* 4 (2), 39-45

Ortega, L. (2009). *Understanding second language acquisition.* Oxon: Routledge.

Pajares, F., (2008).*Motivational role of self-efficacy beliefs in self-regulated learning.* In D. H.Schunk& B. J. Zimmerman (Eds.), *Motivation and self-regulated learning: Theory, research and applications* (pp. 111-139). New York: Erlbaum.

Ramdass, D., & Zimmerman, B., (2011).Developing self-regulated skills: The important role ofhomework. *Journal of Advanced Academics*,22(2), 194–218.

Rieser, S., Naumann, A., Decristan, J., Fauth, B., Klieme, E., &Buttner, G. (2016). Theconnection between teaching and learning: Linking teaching quality and metacognitive strategy use in primary school*, British Journal of Educational Psychology*,86.

Sautelle, E., Bowles, T., Hattie, J., &Arifin, D. N. (2015). Personality, Resilience, Self-Regulation and Cognitive Ability Relevant to Teacher Selection.*Australian Journal of Teacher Education.*Volume 40, Issue 4

Schunk, D. H. (2005).*Self-regulated learning: The educational legacy of Paul R. Pintrich.* Educational Psychologist, 40, 85-94.

Schunk, D.H. &Ertmer, P.A. (2010). *Self-regulation and academic learning self-efficacy enhancing interventions.* In M.Boekaerts, P.R. Pintrich& M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 631-649). Academic Press: San Diego

Simpson, E., H., & Balsam, D., P. (2016). *Behavioral Neuroscience of Motivation,* Current Topics in Behavioral Neurosciences, Volume 27.

Soleymani, B., &Rekabdar, G. (2016).*Relation between Mathematics self-efficacy and Mathematics achievement with control of Mathematics attitude.*Applied Mathematics, 6(1), 16-19.

Zimmerman, B.J. (2010). *Attainment of self-regulation: A social cognitive perspective.* In M.Boekaerts, P.R. Pintrich& M. Zeidner (Eds.*), Handbook of self-regulation (pp. 13-39).* Academic Press: San Diego.

Zimmerman, B. J., &Schunk, D. H. (2011).*Self-regulated learning and performance.*In B. J. Zimmerman and D. H. Schunk (Eds.), *Handbook of self-regulation of learning and performance* (pp. 1-12). New York: Routledge.