THE REVIEW OF ADEDEJI TELLA RESEARCH OF THE IMPACT OF MOTIVATION ON STUDENT’S ACADEMIC ACHIEVEMENT AND LEARNING OUTCOMES IN MATHEMATICS AMONG SECONDARY SCHOOL STUDENTS IN NIGERIA

Senin M.S1, Mohd Norazmi bin Nordin2, Fatin Razak3, Robaisya binti Rahmat4, Muhd Zulhilmi bin Haron5

1Independent Researcher, Malaysia
2Cluster of Education and Social Sciences, Open University Malaysia
3Universiti Teknologi MARA Pahang, Jengka Campus, Malaysia
4Universiti Tun Abdul Rahman (UTAR), Malaysia
5Centre of Education Studies, Universiti Utara Malaysia (UUM), Malaysia

ABSTRACT

Various studies are conducted across topics and complement current needs. Writing an interesting research report reflects the quality of a study. According to Creswell (2003), a good study needs to be provided a systematic framework. Each study must set its own study design whether qualitative, quantitative or a combination of the two. Among the research methodology options by the researchers is quantitative because it is easy to obtain results based on numerical arguments. Consistent with the selected article, the methodology of quantitative research was chosen by the researcher, Adedeji (2007), in conducting a study related to motivation and its effect on the achievement of secondary school students in Mathematics in Nigeria with the use of questionnaires. Article review Adedeji Tella (2007). The Impact of Motivation on Student’s Academic Achievement and Learning Outcomes in Mathematics among Secondary School Students in Nigeria. Eurasia Journal of Mathematics, Science and Technology Education. 3 (2), 149 -156”, this will discuss the criticisms and explanations related to the method of conducting the study and how to write the study report.

Keywords: Motivation on Student, Academic Achievement, Learning Outcomes, Mathematics Education, Secondary School in Nigeria.

I. INTRODUCTION

The title set by the researcher that is Adedeji (2007) is related to the effect of motivation on student achievement specifically for the subject of Mathematics in learning which includes secondary school students in Nigeria. If we look at the topic presented by the researcher, it is very much in line with the focus of the study that is the study of the effect of motivation on learning (Abdul Jalil et al., 2021; Mohd Noh et al., 2021; Mustafa et al., 2021; Roszi et al., 2021; Tumisah et al., 2021). It is clearly explained that motivation is the main key in this study. As advocated by Aresearchguide (2015), that the title of the study must be precise and cover aspects of the study. While the hypothesis of this study compares the gender and level of motivation of students in explaining the focus of the study.

In addition, the variables in this study are also motivation and academic achievement are described very well and clearly in the study (Irma et al., 2021; Suzana et al., 2021; Rohanida et al., 2021; Nazrah et al., 2021; Shahrulliza et al., 2021). It can be seen, the researcher has prepared a special section to explain in detail related to motivation and academic achievement. Among the sections are such as Motivation and Mathematics, Achievement Motivation and Achievement Motivation, Child Expectations and Attributions. However, this description only involves some evidence of past research in general and does not specifically involve high school students. The same goes for some studies where the background of the study site is not stated. Only a few other studies involved students in Nigeria.
II. ARTICLE REVIEW

Overall, the background of the study is very well described. The explanations given in stages successfully bring the reader to understand the storyline regarding the effects and implications of motivation in influencing students' academic achievement. The explanation of the background begins with the need of a country for technology which is an important need today. According to Adedeji (2007), on the insistence related to the mastery of technology, the people need to be strengthened with knowledge related to Science as early as in school. Among the important subjects related to Science besides the subject itself is Mathematics. Therefore, the researcher chose Mathematics as a limiting item in this study.

This background-related storytelling journey continues further with closer relevance to the title of the study. The researcher cites several previous studies as a starting point to describe the factors that affect the learning and achievement of students specifically for the subject of Mathematics. Examples are personality and self-concept (More, 1973), sense of inadequacy (Callahan, 1971), motivation and self-confidence (Aiken, 1976) and several other related studies. These studies significantly reveal factors of student academic achievement. Among the most important ones that need to be emphasized is the study by Aiken (1976), which specifically deals with motivation. Although these studies are over 20 years old, but they are actually very relevant to the focus of the study stated by the researcher. As emphasized by the researchers, although many studies have been conducted by previous researchers, they have not been able to find a definitive word on this matter (Mohd Arafat et al., 2021; Sumaiyah et al., 2021; Hifzan et al., 2021; Shahrul et al., 2021; Helme et al., 2021).

After the researcher evaluated extensively related to this problem, the researcher narrowed the scope to the factors and effects of motivation on student achievement. Taking the basis of Tella’s (2003) study, found that individual students' internal factors related to thinking style, intelligence and personality play including self-motivation play a very important role in influencing student achievement. These descriptions are comprehensive and make it easier for the reader to understand the background of this study well. Explanations that touch on the scope in the focus of the study also make this study easy to follow from one section to another.

The focus and purpose of the study are explained briefly and concisely in one section of its own. The purpose of the study is explained in the form of hypotheses where the researcher will eventually try to prove the hypothesis. According to David (2006, 16), These hypotheses present an assertion about two or more concepts that attempts to explain the relationship between them. Because the study was conducted quantitatively and was deductive in nature, the purpose setting and hypotheses of the study were determined through a margin of error based on a 0.05 result on the validity test. Adedeji (2007) in this study set hypotheses such as, H01: There is no significant difference in the effect of motivation on the academic performance of male and female students in mathematics and H02: There is no significant difference in the academic achievement of highly motivated and low motivated students in the test mathematical achievement. This hypothesis clearly explains the motivational factors in student achievement either based on gender or level of motivation.

Research Questions

As explained in the previous section, the research questions are not specifically explained in this study. There is no special section designated for the description of the research questions. The researcher should set a sub topic for the research question where the reader can make reference whether it is relevant or not. According to Hulley et al (2007, 20), the characteristics of a good research question, assessed in the context of the intended study design, are that it be feasible, interesting, novel, ethical, and relevant. The researcher only set the purpose of the study which was accompanied by two hypothesis discussions because this study used a quantitative research method. The hypothesis set forth is indeed with respect to the title that has been given. Only it is classified to the level and also the gender factor in terms of motivation.

Relevant questions basically need to be explained in the study so that the reader can easily understand the requirements and findings of the study that will be obtained. According to Kdc2 (2015), research questions must be research-friendly where they are determined based on answerability. Arthur (2014), states that this question can invite the reader to find answers to the questions raised. However, the use of hypotheses for this quantitative study is the right choice of the researcher because it leads to the proof of numerical answers at the end of the study.

Literature Review in Article
Literature review is an important aspect of a study. This survey is fundamental to the problem and also the focus of this study. The selection of literature review should be relevant and coincide with the title of the study so that it facilitates researchers to obtain information and be able to collect data in a concrete and focused manner (Farah et al., 2021; Syahrul et al., 2021; Quah et al., 2021; Ahmad Syarifuddin et al., 2021; Jumiah et al., 2021). These studies and journals can also be used as support for each statement made so that the researcher does not move alone. According to Gregory et al (2007,3), a review of the literature is also conducted, among other things, to determine if a theoretical gap exists. Without any support and scientific evidence, a study can be categorized as weak and not up to standard. However, according to Aresearchguide (2015), the selection of literature must be accurate and reliable because it will be an argument to the study.

In this study, several journals and past studies have been reviewed by researchers in determining the direction of the study. Among the selected studies are such as Gesinde (2000), related to the comparison of different levels of motivation of students towards academic achievement in school. In addition, the researcher has also reviewed a study conducted by Yoloye (1976) who has conducted a descriptive study related to the causes and poor academic achievement in Northern Nigeria. Similarly, the study by Skaalvik, 2006; Sandra, 2002) revealed a significant relationship between academic performance and motivation.

All studies selected and reviewed by the researcher coincide with the study conducted. These studies are directly related to the effect of motivation on students' academic achievement although not specifically on the subject of Mathematics. Good selection because of the basis of the same study that has been conducted by previous researchers. However, not all selected studies are current and up -to -date. Based on this study, Adedeji (2007) conducted this study in 2007. So, the study that can be considered current in nature is no later than 1997. This should be taken into account because a good literature review is within 10 years from the date of the study (Mohd Ali et al., 2021; Parimala et al., 2021; Siti Jamilah et al., 2021; Nor Fauziyana et al., 2021; Noel et al., 2021). Researchers should look to fresher and more recent studies. It is emphasized by Aresearchguide (2015), that the selection of research sources must be accurate and current as well as factual. According to NDA (2015,2) as well, there is evidence of a systematic approach to the review of literature which should summarize and evaluate the knowledge base to date.

Relevant and uptodate studies among them are from Harju and Eppler (1997) investigating the relationship between college students learning and performance orientation. Moreover, an acceptable study is Cheung (1998) who hypothesized that the conception of success affects both the propensity to goals and the achievement of actual performance. The researcher also chose the study by Ajayi (1998) who found that there is a significant difference between academic performance and motivation. Subsequent studies are (Broussard and Garrison, 2004; Skaalvik and Skaalvik, 2004; Skaalvik and Skaalvik, 2006; Sandra, 2002), revealing a significant relationship between academic performance and student motivation.

The researcher conducted a critique and drew excellent conclusions in relation to the journals he reviewed. Each selected study was summarized and given an adequate description. These studies also provide a broad overview to the researcher and provide important information to the researcher in continuing his research. According to Kdc2 (2015), a literature review is the basic framework to a study that applies existing knowledge.

Research Methodology in Article

The design of the study is briefly explained under the sub -heading of methodology. This brief description states that the researcher used only one method in obtaining information for this study (Ahmad Shafarin et al., 2021; Junaidah et al., 2021; Farah Adibah et al., 2021; Ahmad Shakani et al., 2021; Muhamad Amin et al., 2021). According to David (2006,19), this methodology, in turn, will be influenced by the theoretical perspectives adopted by the researcher, and, in turn, by the researcher’s epistemological stance. Because this study was conducted entirely quantitatively, the researcher continued to take decisions based on the achievement of the questionnaire administered to the target group. The research methodology must be stated in the study as emphasized by the NDA (2015,3) that is, the methodological choices are discussed within the report and the limitations of the methodology are acknowledged. As stated by this researcher, Adedeji (2007), this study is an ex-post facto design where the researcher has no direct control over the independent variable i.e. motivational effect because the study sample answered the questionnaire based on their own perceptions.

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Overall, the design of this study is very suitable in collecting information quantitatively because the results can directly answer the questions and also the focus of the study that has been set. This concise study design should provide a clearer explanation to make it easier for the reader to understand the course of the study, especially for new researchers. According to the NDA (2015,2), the report includes a concise review of the methodology employed in the research within the body of the report with a more technical description. This statement is supported by Tamsin (2006,2), the methodology stated is appropriate to the research question. As a suggestion, the researcher can provide a mind map in explaining with respect to the design of this study.

**Population and Sample in Article**

The population selected in this study by the researcher can be considered as quite large because it involves two districts in the state of Oyo in Nigeria namely Ibadan North West and Ibadan South West. With a population of 450 people, it is very enough to represent the entire secondary school students in Nigeria. The population consisting of high school students also coincides with the focus of this study. 10 schools were selected which involved 450 people of the study sample who were randomly selected to answer the questionnaire provided.

Sample size, whether large or small, plays an important role in determining the findings of future studies. According to Gregory et al (2007,10), then a smaller sample of between ten to fifteen people may yield sufficient results.

Overall, the researcher has described well the involvement of the population and sample in this study. The researcher also explained how the sample was selected, where the population and this sample were selected and the researcher also stated the age level of the students randomly and also on average. This random sampling is often used in scientific studies. According to John (2013), this method provides an opportunity for all populations to be Successfully selected. Although this statement makes it easier for readers to know the selected sample, but this sampling can be questioned its reliability because in all selected samples may have the same weighting or almost the same.

Regarding the gender of this sample, the researcher did not explain exactly how many of them included males and females. Similarly, their level of motivation, was also not explained because the sample was randomly selected. The explanation regarding the gender and motivation level of the sample is to fulfill the hypothesis stated in the early part of this study. Based on the questions and purpose of the study, the sample size selected is not suitable to represent the whole of Nigeria because the selection was only made among students in two provinces only. According to John (2013), who gave an example of that, at least 1000 respondents were selected across America for the representation of that Country. Limitations in the administration of the questionnaire and the selection of the sample are also expressed indirectly by stating the number of samples selected and the number of schools involved. This is also important to note so that the reader can know the limitations of the study sample that has been selected. According to Ashish (2015), the description related to the limitations of the study must be explained correctly so that it supports the results of the study if there is any relevant debate.

**Instruments Used in Article**

The instruments used in this study are modifications of the Motivation for Occupational Preference Scale (MOPS) by Bakare, (1977) and the Motivation for Academic Study Scale by Osiki (2001). The researcher has named this modified questionnaire as Motivation for Academic Performance Questionnaire (MAPQ). As usual, this questionnaire uses the Likert scale method which is divided into two parts, namely the demographics of the participants and also the items of the questionnaire. The use of such questionnaires is highly relevant and appropriate to obtain accurate results.

Indeed, this Likert scale is widely used in research around the world. The modifications made by the researcher are appropriate because it can help the researcher to obtain more coherent data. According to NSW (2015,2), research instruments are well designed to obtain responses that will answer the questions - they do not include the examination of unnecessary elements and instruments are appropriate for use with participants in terms of language, complexity and length (Santibuana et al., 2021; Nor Diana et al., 2021; Zarina et al., 2021; Khairul et al., 2021; Rohani et al., 2021).

In addition, the researcher also conducted a validity test on the items of this questionnaire where it was administered to 50 high school students who were not involved as a sample of the study. The results in this validity test show a high validity rate and prove that this item can be used in this study. This is stated briefly and
The study was conducted concisely and quantitatively concisely. The researcher explained well starting with the title of the study, purpose of the study, hypotheses, and also details regarding the key words for this study such as motivation and student achievement in Mathematics. The description continues further with the study methodology which includes design, population, sample and instrumentation. The researcher then explained about the data collection, analysis and also the results obtained. As stated by John (2013) that the research procedure must go through several stages namely generating research ideas, formulating research problems, constructing research questions or hypotheses, designing research to answer questions, collecting data, data analysis and interpretation (Badaruddin et al., 2021, Abdul Rasid et al., 2021). Data collection was conducted only by analyzing the responses of students to the questionnaire conducted. According to Super Admin (2007), the study procedure needs to be fully clarified so that the next researcher is easy to make reference and proceed to the next relevant study. Researchers have explained that more than 480 students underwent this test, yet only 450 people were selected to analyze their responses through this questionnaire test. The researcher also explained the way how this test was administered with the help of Mathematics teachers. A description of the questionnaire as well as the requirements of the items contained therein was also given before the test was administered.

The description of this data collection procedure is well explained by the researcher even though it is brief. This indicates that the researcher has good knowledge in quantitative data analysis. According to Tamsin (2006,2), those involved in designing, conducting, analyzing and supervising the research should have a full understanding of the subject area. The descriptions made also seem easy to understand. According to Kdc2 (2015), data collection methods need to be well described so that they are easy to understand. The course of this procedure is easy to understand by the reader because the method of data collection used is only with the administration of the questionnaire test. However, it is not explained how the 450 respondents were selected among the more than 480 respondents involved. In conclusion, the procedure carried out if matched with the method of data collection as well as the focus of the study, is very timely and easy to manage.

The data analysis made by the researcher is an analysis that is very much in line with the design of this study. Such an analysis provides a clear picture and answer to the research questions that have been set in the hypothesis. According to Gregory et al (2007,11), the method of data analysis and results reporting are directly related to the type of questions used. Researchers have used t-test method as well as analysis of variance (ANOVA) as a method of data analysis. The researcher has presented a good data analysis where the use of tables is easy to understand. According to Oancea (2009,3), regarding the presentation of findings as follows, ‘style (compliance with guidelines; non-discriminatory writing; good use of tables and figures).

Three tables were prepared in analyzing the data obtained through the questionnaire test. These three tables provide clear answers to the hypotheses outlined at the beginning of the study. According to NSW (2015,1), quantitative methods allow generalization, prediction and the testing of hypotheses. The researcher also explicitly stated the answers for both research hypotheses. The first hypothesis that the relationship between gender factors and academic achievement shows the opposite. With the findings obtained, it turns out that the gender-related hypothesis does not affect a student's academic achievement. The researcher then stated that the first hypothesis was rejected.

In contrast to the results of the analysis to answer the second hypothesis related to the level of student motivation in influencing the academic achievement of a student, especially for the subject of Mathematics. Through the presentation of the table shown, the results prove that the second hypothesis is acceptable where the level of motivation is very significant on the academic achievement of students. Each significant and relevant result ratio is clearly stated by the researcher by stating specific figures.

The results obtained in the table, are restated by the researcher for the purpose of explanation to the results. Overall, the data analysis performed coincided with the study design and successfully provided answers for both hypotheses set. Although the researcher did not state the reason for the choice of how this data analysis was
made, but the style of presentation and description involving the sentences and tables given is very relevant and easy to understand by the reader. According to John (2013), among the methods of data interpretation that are often used are such as tabulations, charts, tables, graphs, plots, histograms and others.

Overall, the results of this study are acceptable although they are not stated in detail especially in relation to the argument of the use of t-test and ANOVA. There is also confusion in the calculation of the results in the F-Ratio section of Table 3 that the researcher states that the number is 23.01, but the correct calculation gives the answer 2301. Such small errors may be avoided in the next study because such errors will give significant impact on the results of the study.

Findings and Discussion in Article

Findings and discussions conducted at the end of this study revolve around the factors and implications of motivation on students' academic achievement for the subject of Mathematics. The discussions conducted coincide with the findings obtained through data analysis. Clearly this discussion is not out of the context of the study. According to the NDA (2015,4), clear links are identified between data, interpretation and conclusions such that others can follow a coherent, convincing and objective ‘decision trail’. By relating the findings and answers to the hypotheses obtained, the researcher stated implicitly related to the role of motivation in influencing students' academic achievement. Taking some examples of studies that have been conducted, the researcher compared the findings of his study with those studies. There are two different results namely pros and cons.

This study indirectly refutes the study conducted by Saina et al (1998) which stated that gender differences between males and females affect students' academic achievement, especially for the subject of Mathematics. The researcher argued that the study could not be in line with the results of his study due to environmental differences. The study conducted by Saina et al (1998) is to cover students in Asia and not in African countries like Nigeria. Geographical and environmental differences may influence academic achievement and do not depend on gender differences.

Other studies cited by the researcher such as the study by Bank & Finlapson (1980) are parallel and coincide with the findings obtained by the researcher. In the study, they stated that the level of motivation of a student greatly affects his academic achievement. Similarly, the study of Ayotola (1998) which stated that several factors related to motivation play an important role in influencing the continuity of student learning. It is also agreed by John (1996) in his study which found that motivation is an important factor in influencing academic achievement.

The implications, recommendations and direction of the next study are clearly stated in this study. In addition to some suggestions to improve student performance in the subject of Mathematics, the researcher also mentioned the implications that require many parties to work together in helping students achieve better results in academic achievement, especially for the subject of Mathematics. The researcher also hopes that this study can be a useful resource to the relevant parties in continuing the noble efforts for the benefit of students. However, the researcher did not clearly state the limitations of this study to be used as a source.

III. CONCLUSION

In conclusion, this study has a very meaningful impact on education practitioners in the study country of Nigeria. With the increasing demand for mastery of information technology, then the mastery of Science-related subjects such as Mathematics, should be given due emphasis by the parties involved. The researcher's initiative in highlighting the factors to improve student achievement in the subject of Mathematics is very much needed by the readers of this study in general and teachers in particular. Some of the recommendations proposed at the end of the study should be given attention so that it can be applied to secondary school students in Nigeria.

This simple but concise study gives the impression that a quality study is a study that has its own impact and meaning to the reader as well as other researchers. By using only one research instrument, namely the questionnaire, the researcher has succeeded in proving the two hypotheses that have been proposed whether they are accepted or rejected. The use of a quantitative research methodology which involves proof through such figures will present a rigid and accurate result. In terms of writing, this study is reported briefly and uses sentences that are easy to understand. For readers who are not directly involved in the context or environment in the study, it is very easy to understand. Similarly, for other researchers who want to make this article as a
reference, it is very accurate and easy to understand. A clear description of something in the study, makes this study very reader friendly. The selection of literature reviews is also very numerous, varied and relevant to the study conducted.

However, there are some things that can be suggested for improvement such as a description of the limitations and limitations of the study should be reported. The same goes for the method of determining the respondents

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