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ROLE OF ACADEMIC SELF-CONFIDENCE AND TECHNOLOGICAL EXPERIENCE IN DETERMINING SECONDARY SCHOOL STUDENTS' ACADEMIC ACHIEVEMENT IN MATHEMATICS IN ANAMBRA STATE, NIGERIA

Anyanwu Adeline Nne & **Emesi Kingsley Ekene**
Department of Educational Foundations
Faculty of Education, Nnamdi Azikiwe University Awka Anambra State
an.anyanwu@unizik.edu.ng;kingsleyemesi@gmail.com

ABSTRACT
Although confidence is one of the major contemporary concerns in psychology of education, extant study has primarily been concerned with its association with technological experience in determining academic achievement. The study aimed to explore the role of academic self-confidence and technological experience in determining secondary school students' academic achievement in mathematics in Anambra State. Four research questions and four null hypotheses guided the study. The study adopted a correlational approach to provide answers to the research questions and testing of the hypothesis. The population of the study comprised of 21204 from which a sample of 600 was drawn. Multi-stage procedure was used to select the sample. Two standardized research instruments namely; Academic Self-Confidence Scale (ASCS) and Media and Technology Usage Experience Scale (MTUES), as well as score from students' promotional examination were used for data collection. Cronbach's alpha was used to determine the reliability of the items in the instruments. A reliability index of 0.81, and 0.79, for academic self-confidence and technological experience respectively. The overall reliability coefficient was 0.8 which shows that the instrument was reliable and good for the study. The Pearson Product Moment Correlation was used to answer research questions 1-3 and test of hypotheses 1-3 while the research question four and hypothesis four were answered and tested with multiple regression. Findings showed that students' academic self-confidence recorded a very low positive relationship academic achievement. Findings also revealed that the variables do not statistically predicted students' academic achievement in mathematics. Based on these findings, it was recommended that school teachers should device new teaching strategies to enhance students' academic self-confidence so that it will boast their confidence to engage in learning.

Keywords: Academic self-confidence, Technological experience and Academic achievement.

Introduction

The poor performance of the students in mathematics in Nigeria has attracted the attention of educational planners, teachers, and researchers. On this issue, researchers have shown tremendous concern about the poor performance of students in mathematics. This abysmal performance indicates poor academic achievement mostly in the domain of mathematics. Academic achievement has been defined as a student's cumulative score in any academic context. These according to Mehrens and Lehmann (2008) are scores characterized the academic scores obtained from achievement test assigned to assess a person's performance in a course of study which he/she has undergone. The study of Emesi (2017) described these as teacher-assigned scores that represent the most salient performance feedback given to the students which serve as achievement indicator in a classroom test.

In an effort towards scientific and technological advancement, the importance of mathematics cannot be overemphasized. Nigeria needs nothing short of good performance in mathematics at all levels of schooling. Unfortunately, the performance of students in mathematics at the end of secondary education has not improved (Yaloye, 2013). In another study, Yusuf (2014) noted that achievement in

mathematics is not only considered as important in its own right as a field of study and research, but also an essential guide to science and technological development in the society. Despite the relevance of mathematics and its achievement, reports from various schools and the information obtained from other standardized examination boards in Nigeria revealed that students still perform abysmally in the subject. Many reasons have been given for dismay performance of students in mathematic context such as; students negative self-esteem, low self-efficacy beliefs and high level of academic disengagement. Despite improvement on these identified variables, the problem still persists. One begin to think of some other variables that could influence, enhance and predict academic achievement in mathematics. Such variables are technological experience and academic self-confidence.

To this end, it will be interesting to describe self-confidence as an individual's personality construct which enables a person to have a positive or realistic view of his or herself in relation with the situation that he /she is into. The study of Miller, George, and Steven (2015) described self-confidence as a person's expectation of his/her ability to achieve a goal in a given situation and is a very influential factor in ensuring that a person's potential is realized. In other words, persons with a high self-confidence has a realistic view of themselves and with capability which makes them persistence in their endeavours. Nested to this present study is academic self-confidence that refers to the standard of ideas or the assurance that a person has in his/her own ability to achieve academically as it was derived from the academic self-confidence scale being developed by Jones (2001). Also, Koarraju and Nadler (2012) described academic self-confidence as students' beliefs that they can perform well in school. It is self-beliefs and constructs that deal with individuals' opinions on how they feel about themselves in achieving academically. In another observation, Stankov, Morony and Lee (2014) noted that academic self-confidence could be describe as the individuals' beliefs that they can accomplish a given task or achieve a desired academic objective. This indicates that academic self-confidence is one of the most influential indicator, facilitator, motivator, and regulator of behaviour in peoples' everyday academic life. For example, a growing body of historical evidence suggests that one's perception of ability or academic self-confidence is the central mediating construct of achievement striving (Bandura, 1977).

On this end, it is acceptable to say that academic self-confidence is not only a motivational perspective by itself, but a judgment about capabilities of accomplishment of some academic goal; and therefore, must be considered within a broader conceptualization of motivation that provides the academic goal contexts. This shows that academic self-confidence is a potent predictor of an individual's performance, given the appropriate skills and adequate incentives. As this has been conceived as students' perceived ability and perceived competence, it describes a person's perceived capability to accomplish a certain level of academic tasks (Koarraju and Nadler, 2012). For this reason, Bandura (1977) described academic self-confidence as people's judgments of their capability to perform specific academic tasks. Bandura's observation also purported that academic self-confidence is a product of a complex process of self-persuasion that relies on cognitive processing of diverse sources of confidence information. Sequel to the above observations, linking academic self-confidence to technological experience of the students to see how each can influence each other in determining mathematics achievement is one of the major aims of the study. As digital technology is one of the world's amazing inventions that is sweeping very fast across the globe. The speed of the release of new technology now has jumped exponentially to impact both positively and negatively to many academic domain. With the invention of internet facilities, the explosion in digital connectivity is shaping the academic society as many students have been positively and negatively influenced by this digital technological experience.

Technological experience has becomean integral part of life in the 21st century with it's

presence increasingly influencing almost every facet of our lives. According to Mustafaoglu, Zirek, Yasaci, and Ozdincler (2018) digital technology's integration into the daily lives of children and it's influence on their cognitive, emotional, and social development continues to increase, it offers many opportunities for children to play, to explore, and to learn. These learning opportunities constitute a critical developmental influence on the children's academic domain. Moreover, Anyanwu and Emesi (2019) were of the view that within the domain of mathematics education, technological experience is perceived as one of the valuable tools and the affordances of this allow mathematics learning to be reshaped and practiced in distinctive ways. In another observation, Gupta and Liyagat (2018) captured that technological experience has been defined as competence, knowledge based skills, and dispositions people have developed in the process of interactions with digital technological apparatus which enable themto contribute to the digital society. In their observation, Carle, Jaffee and Miller (2015) added that technological experience as a result of digital technological innovations is reputed to offer rich pedagogical opportunities to transform students' learning, by improving students' confidence. This shows that technology experience may facilitate students' academic self-confidence and academic achievement by enhancing their learning experience.

On the other hand, Anyanwu and Emesi (2019) in their contribution described technological experience as the combination of digital knowledge, skills, and competencies as a result of digital exposure that facilitates students' interest to engage more meaningfully in their academic contexts. Simply put, it is the combination of technological knowledge, skills, and competencies that help individuals to live and contribute meaningfully to the ever-changing digital society. Suffice it to say that many studies have revealed that the construct of academic self-confidence and technological experience can influence and determine students' academic achievement. For instance, the study of Anyanwu and Emesi (2019) revealed that a very low positive relationship was recorded between students' technological experience and academic achievement in mathematics, but the regression analysis revealed that the relationship was not significant. Also, the study of Alias, Hafir (2019) that examined the relationship between academic self-confidence and cognitive performance, recorded a positive statistical relationship between academic self-confidence and cognitive performance, while the regression analysis indicated a significant relationship. The study of Karimi and Sasdatmand (2014) which recorded a meaningful relationship between students' technology lesson and self-confidence and they have a significant relationship with academic achievement is also an evidence that students' confidence has a link with their digital learning exposure and learning contexts.Considering the importance or impact of information technology usage in the societal context, Goncalves, Martins, Percira, Oliveira, and Ferreira (2012) study considered that this usage makes our society more complete and able to evolve, since it contribute to increase peoples' quality of life, as well as the competitiveness and productivity of enterprise. It is on this note that the present study aimed to examine the relationship between students' academic self-confidence and technological experience as variables that may jointly determine students' achievement in mathematics.

Therefore, determining the degreeto which students' engage with technological experience in learning as it may have a link with their academic self-confidence in determining their achievement academically has been a debating issue among the scholars in the field of educational research. The problem is could the academic self-confidence and technological experience jointly predict mathematics achievement at secondary school students in Anambra State. Then as a result of paucity of research on these variables in determining academic achievement in Nigeria academic literature, the researchers aimed to examine the role of academic self-confidence and technological experience in determining students' academic achievement in mathematics in Anambra State.

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Research Questions

1. What is the relationship between students' academic self-confidence and their academic achievement in mathematics?
2. What is the relationship between students' technological experience and their academic achievement in mathematics?
3. What is the relationship between students' academic self-confidence and their technological experience?
4. What is the proportion of variance in academic achievement in mathematics that is explained by the predictive strength of academic self-confidence and technological experience?

Hypotheses

1. There is no significant relationship between students' academic self-confidence and their academic achievement in mathematics.
2. There is no significant relationship between students' technological experience and their academic achievement in mathematics.
3. There is no significant relationship between students' academic self-confidence and their technological experience.
4. The proportion of variance in academic achievement in mathematics that is explained by the predictive strength of academic self-confidence and technological experience is not significant.

Research Method

The researchers used a correlational research design and questionnaires to collect data for the study. The population of the study consisted of 21204 being the total number of students in senior Anambra State. A sample size of 600 questionnaires were administered to respondents and collected for data analysis. Multi-stage sampling procedure was used to select the respondents. The procedures for the selection were as follows: In stage one, three education zones were selected from the six education zones in the state by simple random sampling. Then in stage two, from each sampled education zone, one local government area (L.G.A) was selected through simple random sampling given a total of three (3) L.G.As. In stage three, from each sampled L.G.A, 10 schools were randomly selected giving a total of 30 schools. Then, from each of the schools, 20 SSII students were selected for the study using a table of simple random sampling. This gave a total number of 600 students used in the study.

The study adapted two standardized research questionnaires namely, Jones (2001) Aacademic self-Confidence Scale (ASCS) and Rosen, Whalig, Carrier and Rokkum (2013) Media and Technology Usage and Attitude Scale (MTUAS). The students' achievement scores were obtained from the schools before the start of the administration of the other two instruments. The students' achievement scores in mathematics from the state wide senior secondary one (SS1) promotion examination were obtained from the schools before the administration of the instruments.

The methods used for validating the instruments were face and content validity by the three experts from the Faculty of Education, Nnamdi Azikiwe University Awka. Cronbach's alpha reliability method was used to determine the internal consistency of the items in the research questions such as 0.81 and 0.79 for academic self-confidence and technological experience respectively. The overall reliability coefficient was 0.8 which shows that the instrument was reliable and good for the study.The Pearson Product Moment Correlation Coefficient was used in answering research questions one to three and testing of hypotheses one to three. Multiple regression was used to answer research question four and to test hypotheses four at 0.05 level of significance. The decision rule for null hypotheses with P-value higher than 0.05 was not rejected, while the hypotheses with P-value lower than 0.05 was rejected. The guide for interpretation of correlation results was done in accordance with Okoye (2015). Rough guide for interpreting

correlation coefficient values when a large number of pairs of scores have been correlated. The decision rules to interpret the research questions were presented as follows: r= ± .00, no relationship; r = ± 0.0 to ± 0.2, very low relationship; r = ± 0.2 to ± 0.4, low relationship; r = ± 0.4 to ± 0.6, medium relationship; r = ± 0.6 to ± 0.8, high relationship; and r = ± 0.8 to ± 1.0, very high relationship.

Presentation of Results

Research Question 1: What is the relationship between students' academic self-confidence and their academic achievement? (N= 600)

Variables	Academic achievement (r)	Remarks
Academic self-confidence	0.12	A very low positive relationship

The results in table 1 reveal very low positive relationship between students' academic self-confidence and their academic achievement.

Research Question 2: What is the relationship between students' technological experience and their academic achievement? (N= 600)

Variables	Academic achievement (r)	Remarks
Technological experience	-0.05	A very low negative relationship

The results in table 2 reveal very low negative relationship between students' technological experience and their academic achievement.

Research Question 3: What is the relationship between students' academic self-confidence and their technological experience? (N= 600)

Variables	Technological experience (r)	Remarks
Academic self-confidence	.236	A very low negative relationship

The results in table 3 reveals very low positive relationship between students' academic self-confidence and their technological experience.

Research Question 4: What is t*he proportion of variance in critical thinking that is explained by students' students' learning strategies and their self-directed learning?* (N= 600)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.015[a]	.000	-.003	7.32259

Table 4 reveals that the proportion of variance in academic achievement that is explained by students' students' academic self-confidence and technological experience is 0%. While R adjusted is -.003 with standard error of 7.32259.

Hypothesis 1: There is no significant relationship between students' academic self-confidence and their academic achievement in mathematics. (N = 600)

Variable	Mathematics achievement (r)	P-value	Remark
Academic self-confidence	0.12	.761	NS

NS-Non-Significant correlation at 0.05 level of significance.

The results in table 5 reveal that there is no significant relationship between students' academic self-confidence and their academic achievement in mathematics. (r =0.12 <0.05). (N = 600)

Hypothesis 2: There is no significant relationship between students' technological experience and their academic achievement in mathematics.

Variable	Mathematics achievement (r)	P-value	Remark
Technological experience	-0.05	.903	NS

NS-Non-Significant correlation at 0.05 level of significance.

The results in table 6 reveals that there is no significant relationship between students' technological experience and their academic achievement in mathematics. (r = -0.05< 0.05). (N = 600)

Hypothesis 3: There is no significant relationship between students' technological experience and their academic achievement in mathematics.

Variable	Technological experience (r)	P-value	Remark
Academic self-confidence	.236	.000	S

S-Significant correlation at 0.05 level of significance.

The results in table 7 reveals that there is a significant relationship between students' academic self-confidence and their technological experience. (r = .236> 0.05).

Table 8: Multiple Regression of Students' Academic Self-confidence and their Technological Experience on Students' Achievement Mathematics. (N =600)

Model	Unstandardized Coefficients B	Standardized Coefficients Std. Error	Beta	T	Sig.
1 (Constant)	47.012	1.353		34.754	.000
Academic self-confidence	.004	.013	.014	.342	.732
Technological experience	-.007	.038	-.008	-.199	.842

The table 8 shows a multiple regression run to predict students' academic achievement from academic self-confidence and technological experience. The results in the table also reveals the relative contribution of each variable, however reveals that academic self-confidence is the most potent predictor of students' academic achievement than the other variable (β = .014, t

= .342, P = .732) followed by technological experience (β = -.007, t = -.199, P = .842). Conclusively, the null hypothesis was accepted, then it was concluded that students' academic self-confidence and technological experience does not significantly predicted their academic achievement in mathematics.

Discussion

Findings from table 1 reveal very low positive relationship between students' academic self-confidence and their academic achievement in mathematics. It also, recorded a no significant relationship between the two variables. This supported the study of Alias and Hafir (2019) that recorded a positive statistical relationship between academic self-confidence and cognitive performance. Then, the hypothesis testing does not support the study of Alias and Hafir's study that recorded a significant relationship between academic self-confidence and cognitive performance.

Findings from table 2 reveal very low negative relationship between students' technological experience and their academic achievement. It also, recorded a no significant relationship between the two variables. This does not support the study of Anyanwu and Emesi (2019) that recorded a very low positive relationship between the two variables. Then, on the hypothesis testing the findings supported the study of Anyanwu and Emesi as both recorded no significant relationship between the two variables.

Findings from table 3 reveal very low negative relationship between students' technological experience and their academic self-confidence, while a significant relationship existed between the two variables. This supported the study of Karimi and Sasdatmand (2014) which recorded a meaningful relationship between students' technology lesson and self-confidence and they have a significant relationship with academic achievement.

Findings from table 4 reveal that the proportion of variance in academic achievement in mathematics that was explained by students' academic self-confidence and technological experience is 0%. Therefore, this findings show that the proportion of variance which students' academic self-confidence and technological experience has contributed does not explain mathematics achievement.

Conclusion

The behavioural outcome of the present study is portraying that academic self-confidence and technological experience play the role of both indicator and facilitator of learning among the students at a low level of estimated association. As the findings from the study revealed a very low positive and a very low negative relationship among the variables that predicted academic achievement, it shows that these variables can stand as robust predictors of learning if properly guided and utilized.

Recommendations

Based on the findings, the following recommendations were made.

1. The school teachers should device new teaching strategies to enhance students' academic self-confidence so that it will boast their confidence to engage in learning.
2. Government should play their path by providing modern technological apparatus to facilitate teaching and learning since the students' technological experience has recorded a very low negative relationship with academic achievement of the students.
3. Based on the approach adopted for the study, the findings should be a source to develop the a behavioural intervention which education policy makers, school administrators, counselors, parents and teachers could utilize in improving students' self-confidence as well as sealing off the gaps in the usage of modern technological equipment in teaching and learning
4. The significant and positive relationship that existed between students' academic self-confidence and technological experience is an indication that if these constructs are properly developed, students will be more diligence in

achieving their academic goals. Therefore, teachers should see this as an opportunity to change their teaching techniques to enable them transform students' academic self-confidence towards focusing attention on digital learning.

5. Finally, it is recommended that a follow-up study should be conducted to determine how the subject being taught with the use of technological equipment within the classroom has influenced the development of students' academic self-confidence.

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