

Interest in Mathematics as a Predictor of Undergraduate Students' Performance in Mathematics

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ABSTRACT

Interest as a construct of motivation in learning improves students' performance in mathematics. Lack of interest in mathematics is a factor discouraging most students from learning mathematics. This study investigates interest in mathematics as a predictor of undergraduate students' performance in mathematics. Correlational research design was adopted. Study population was 348,199 undergraduate students at the Nigeria universities. Sample of 467 students who completed the questionnaire was obtained using random sampling techniques. Instrument for data collection was Students Interest in Mathematics Questionnaire (SIMQ). Validity of the instrument was ascertained by experts in Mathematics Education and Educational Psychology. Reliability of .89 was obtained using Cronbach's alpha. Students' performance in mathematics was obtained from GPA. Data was analysis using multiple regression at 0.05 significant level. Finding reveals interest in mathematics significantly predicts undergraduate students' performance in mathematics. Base on the finding study recommend university authorities in encouraging undergraduate students to developed interest in mathematics for better performance in mathematics.

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INTRODUCTION

In recent times, there has been a heightened focus on the performance of undergraduate students in mathematics, driven by the recognition of mathematics' fundamental role in various aspects of human endeavors. Educators and researchers alike have directed their attention towards identifying the factors that contribute to students' poor performance in mathematics (Shahjahan et al., 2021). Studies have consistently linked students' lack of interest in mathematics (Shoib & Saeed, 2016; Mazana et al., 2020), negative attitudes towards the subject (Sa'ad et al., 2014; Mazana et al., 2019), and mathematics anxiety (Summer, 2020) as significant contributors to this issue. The abstract

nature of mathematics often poses a challenge, leading many students to develop a disinterest in the subject (Yeh et al., 2019). To address this, Azmidar et al. (2017) advocate for the implementation of concrete pictorial approaches to stimulate students' interest in mathematics. Interest emerges as a crucial variable in predicting students' performance in mathematics (Sigh et al., 2002). Obodo (1997) notes that continuous aversion to mathematics results in poor performance among students. Azmidar et al. (2017) characterize interest as a psychological impetus driving students' active engagement in learning. Indeed, interest, as a motivational construct, exerts a significant influence on students' performance in mathematics (Renninger & Hidi, 2011; Sauer, 2012; Ahmed, 2016).

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Students who exhibit interest in mathematics often report higher competencies and develop more positive attitudes towards the subject (Marsh et al., 2005). Toli and Kallery (2021) highlight attention, effort, affect, and experience as key characteristics associated with interest. Fisher et al. (2012) further assert that interest serves as a catalyst for successful learning and performance in mathematics. Additionally, interest functions as an attitudinal variable that predicts students' performance in the subject (Kihwale & Mkomwa, 2020).

Conversely, the lack of interest in mathematics serves as a significant deterrent for many students, discouraging them from actively engaging with the subject (Boniface, 2018; Otoo et al., 2018). Arthur et al. (2014) suggest that students' excitement fosters greater engagement in learning activities. Furthermore, students who demonstrate interest in mathematics exhibit a heightened discernment in their decision to pursue further studies in the subject (Renninger & Hidi, 2016; Azmidar et al., 2017). Studies by Satiyeh and Ali (2014) and Mohamed and Aron (2017) have established a clear relationship between interest and students' performance in mathematics, further emphasizing the pivotal role of interest in shaping academic outcomes in the field.

Objective of the Study

The study sought to determine the interest in mathematics as a predictor of undergraduate students' performance in mathematics.

Research Question

To what extent do interest in mathematics predict undergraduate students' performance in mathematics?

Hypothesis

Interest in mathematics do not significantly predict undergraduate students' performance in mathematics.

THEORETICAL FRAMEWORK

Renninger and Hidi (2011) define interest as the disposition to engage in a particular discipline over time. Wong and Wong (2019) define interest as the state of engaging in learning and confidence in interacting with others. Emefa et al. (2020) sees interest as the psychological state that occur during interaction, willingness, attention and positive feeling towards a particular subject.

Interest is the feeling to know and learn more about a subject, interest attract the attention towards a phenomena and serves as motivational variable for educational attainment (Sumaila & Bello, 2018). Disha (2016) states that interest is a condition stimuli express as like or dislike of activities. Interest places emphasis on attributes such as emotion, perceive value, knowledge and engagement (Renninger & Hidi, 2011).

Muller and Louw (2004) states that intrinsic motivation is associated with curiosity and exploration while extrinsic motivation is the willingness to attain desirable outcome. Interest in mathematics as complex behavioural learning its importance cannot be over emphasis (Mohamed & Aron, 2017). Lack of interest in mathematics is developed by most students due to difficulties experience in solving problems in mathematics (Aguila et al., 2012). Negative perception about mathematics is widely spread among students due to the belief that mathematics is difficult (Galamidis, 2002). Peteros et al. (2020) assert that recognising and awarding students for excellent performance would boost their interest in mathematics. Sigh et al. (2002) found motivation and interest as instruments for enhancing students' performance in mathematics.

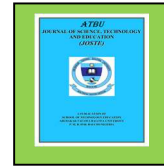
Studies reveals Interest Driven Creator (IDC) promotes students interest in mathematics (Wong & Wong, 2019; Wong et al., 2020). Wong et al. (2020) highlights the models use in developing students' interest to include triggering, immersing and extending. Triggering involves catching students interest through attention arresting situations while immersing means a maintain response to engage in learning activities (Harackiewicz et al., 2016). Onah and Anamezie (2022) in their study on interest as a predictor of

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students' academic performance found interest as a significant predictor of academic performance. Arhin and Yanney (2020) in determining relationship between students' interest and performance in mathematics found a significant positive relationship between interest and students performance in mathematics.

Tembe *et al.* (2020) in their study on interest in mathematics as correlates of performance in mathematics found a significant positive relationship between interest in mathematics and students performance in mathematics. Wong and Wong (2019) in examining relationship between students' interest and academic performance in technology enhance learning environment found a significant relationship between interest in mathematics and students performance in mathematics. Fakolade (2019) study on relationship between senior secondary students' interest and academic performance found a significant positive relationship between interest and students' academic performance.

Long (2019) investigates the association between interest and performance in mathematics among Malaysia undergraduate students finding reveal significant relationship between interest and students performance in mathematics. Sumalia and Bello (2018) in their study on gender, interest and school type as predictor of performance in trigonometry found interest as predictor of students' performance in trigonometry. Mohamed and Aron (2017) in their study on high school students' interest and performance in mathematics found significant difference between interest and students performance in mathematics. Anigbo (2016) in investigating factors affecting interest in mathematics found interest as a predictor of student performance in mathematics. Arhin and Yanney (2020) determines relationship between interest and students' performance in mathematics finding reveals less interest in mathematics among students. Kihwele (2022) conducted a study in promoting students' interest and performance in mathematic using mathematics King and Queen Initiative finding

reveal significant impact of interest on students' performance in mathematics.

Kpolovie *et al.* (2014) study on secondary students' interest in learning found a significant correlation between interest in learning and academic performance. Review indicates studies on relationship between interest and students performance in mathematics however not much is known of study on interest in mathematics as a predictor of undergraduate students performance in mathematics. This research gap necessitates the study on interest in mathematics as a predictor of undergraduate students' performance in mathematics at the Nigeria universities.

METHODOLOGY

Study adopted correlational research design to determine the predictive effects of interest in mathematics on undergraduate students' performance in mathematics. Study population was 348,199 undergraduate students at the Nigeria universities. Sample of 467 students obtained from twelve randomly selected universities participated in the study. Instruments for data collection was Students Interest in Mathematics Questionnaire (SIMQ). SIMQ validity was ascertained by experts in fields of Mathematics Education and Educational Psychology who critically examine each items on the instrument, corrections and suggestion given were effected before the administration of SIMQ on the students. Reliability of SIMQ was obtained as .89 using Cronbach's alpha. Data for the study collected was analysed using multiple regression at 0.05 significant level.

RESULTS

Multiple regression determines predictive effect of explanatory variable (interest in mathematics) on dependent variable (performance in mathematics). The regression model contributes 86.0% variance on performance in mathematics and adjusted R square of 73.7% is consider goodness fit for the model (Cohen *et al.*, 2018). F statistics is significant at ($F(1,443) = 415.756, P < 0.05$).

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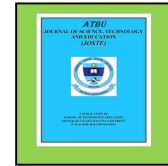


Table 1: Multiple Regression Analysis on Interest in Mathematics as a Predictor of Students Performance in Mathematics

Model		Unstandardized Coefficients		Standardized Coefficients		Sig.
		B	Std. Error	Beta	T	
1	(Constant)	-.420	.263		-1.596	.111
	Interest in Mathematics	.019	.003	.385	5.625	.000

a. Dependent variable: Performance in Mathematics, Significant at 0.05 level

Table 1 reveals that interest in mathematics has a significant positive relationship with the outcome variable, as indicated by the significant standardized coefficient and the low p-value. Specifically, for every one-unit increase in interest in mathematics, the outcome variable increases by 0.019 units, holding all other variables constant. The standardized coefficient of 0.385 indicates that interest in mathematics explains a substantial portion of the variance in the outcome variable.

FINDING

The study delved into the correlation between students' interest in mathematics and their performance at the undergraduate level. Through rigorous analysis, it revealed a compelling link between these variables, emphasizing the pivotal role of interest in shaping academic outcomes. Surprisingly, the findings showcased interest in mathematics as a potent predictor of success in the subject. This highlights the importance of fostering a genuine curiosity and passion for mathematics among students from early stages of education.

Moreover, the research elucidated that heightened interest in mathematics corresponds to enhanced performance levels among undergraduates. This suggests that when students are genuinely engaged and intrigued by the subject matter, they are more likely to invest effort and time into mastering mathematical concepts, ultimately yielding better results academically. Conversely, the study underscored the detrimental impact of waning interest on students' mathematical proficiency, indicating a direct correlation between lack of enthusiasm and poor performance. This highlights the critical need for educational strategies aimed at nurturing and

sustaining students' interest in mathematics throughout their academic journey.

In essence, the study underscores the intricate interplay between interest and performance in mathematics among undergraduate students. It advocates for educational interventions that prioritize cultivating and maintaining students' enthusiasm for the subject, recognizing it as a key determinant of their success. By acknowledging and addressing the significance of interest, educators and policymakers can devise targeted approaches to promote mathematical literacy and academic achievement among undergraduates.

DISCUSSION OF FINDING

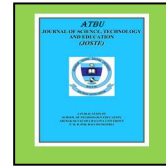
Interest in mathematics has emerged as a consistent predictor of undergraduate student performance, aligning with several notable studies in the field. Kpolovie (2014) similarly identified interest as a key predictor of students' academic performance, reinforcing the notion that genuine enthusiasm for the subject directly correlates with success. Anigbo (2016) further corroborated these findings in their research on factors influencing students' interest in mathematics, highlighting interest as a significant predictor of performance in the subject. Similarly, Sumaila and Bello (2018) provided support for this relationship, underscoring the importance of interest in predicting students' mathematical proficiency. However, divergent perspectives exist within the academic discourse. Yu and Sigh (2016), in contrast to the aforementioned studies, did not find interest to be a significant predictor of performance in mathematics. This contradiction challenges the prevailing consensus and underscores the complexity of factors influencing academic achievement in the field of

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mathematics. Nevertheless, the present study aligns with the majority of research findings, reaffirming interest in mathematics as a robust predictor of undergraduate students' performance in the subject. By acknowledging and addressing the role of interest, educators and policymakers can implement targeted interventions to enhance students' engagement and ultimately improve their mathematical outcomes.

CONCLUSION

The interest of students significantly influences their performance in mathematics; those who demonstrate interest in the subject are more inclined to pursue studies in mathematics. Conversely, a lack of interest in mathematics is identified as a factor that hinders many students from engaging effectively with the subject. The findings of the study serve to raise awareness among educational policymakers regarding the predictive effects of interest in mathematics on students' performance in the subject. This insight can inform the development of policies aimed at enhancing students' interest and engagement with mathematics, thereby fostering improved academic outcomes.

RECOMMENDATION

Based on the findings the study recommends that:

1. University authorities to encourage undergraduate students to develop interest in mathematics considering its role on performance in mathematics.

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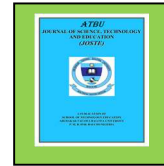
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