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The Effect of Teaching on Entry Behavior of Students in Mathematics

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Abstract

This study investigates the impact of teaching method on the entry behavior of students in mathematics. The study utilized both quantitative and qualitative data analysis methods with a focus on pre-and post- intervention survey scores. The results indicate that student exposed to interactive and experimental teaching methods showed significant improvements in their attitude motivations, and perceptions towards the subject. The finding suggests that these teaching methods are more effective in influencing entry behavior compared to traditional methods. The study highlights the importance of adopting innovative teaching practices to create a more engaging learning environment and improve, overall learning outcomes. Further research is recommended to explore the long term effect of teaching methods on entry behavior and academic performance in different educational settings.

Keywords: Effect, Teaching, Methods, Entry-Behaviour

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INTRODUCTION

Mathematics education is a cornerstone of academic development, providing students with essential skills and knowledge for success in various fields. However, many students face challenges in learning mathematics, leading to negative attitudes, low confidence levels, and limited engagement with the subject. Understanding and addressing students' entry behavior in mathematics are essential for improving teaching practices and enhancing students' learning experiences.

Students' entry behavior in mathematics encompasses their initial attitudes, beliefs, and prior experiences with the subject. Positive entry behavior is associated with greater motivation, higher self-efficacy, and increased willingness to engage with mathematical concepts, while negative entry behavior can hinder learning and academic achievement. Effective teaching strategies play a vital role in shaping students' entry behavior and fostering a supportive learning environment.

A recent study by Rodriguez and Fernandez (2023) investigated the impact of flipped classroom instruction on students' entry behavior in mathematics. The researchers implemented a flipped classroom approach in a secondary mathematics classroom and assessed its effects on students' attitudes, self-directed learning skills, and academic performance. The findings indicated that students who participated in the flipped classroom model showed increased engagement, improved self-regulation, and higher levels of achievement compared to those in traditional lecture-based classrooms.

According to Lee and Chen (2022) investigated the influence of metacognitive strategies on students' entry behavior in mathematics. The researchers implemented metacognitive interventions in a middle school mathematics classroom and examined their effects on students' metacognitive awareness, problem-solving skills, and self-regulation. The findings revealed that students who received metacognitive instruction demonstrated enhanced metacognitive abilities, improved problem-solving strategies, and increased confidence in their mathematical capabilities compared to those in the control group.

Similarly, according to Wang and Liu (2023) explored the impact of gamification on students' entry behavior in mathematics. The researchers implemented gamified activities in a primary school mathematics classroom and assessed their effects on students' motivation, engagement, and academic performance. The findings revealed that students who participated in gamified learning experiences showed increased interest in mathematics,

improved problem-solving skills, and higher levels of achievement compared to those in traditional instructional settings.

This study highlights the effectiveness of flipped classroom instruction as a teaching strategy for promoting positive entry behavior in mathematics.

Statement of the Problem

Mathematics is a subject that many students struggle with in Nigeria, leading to low entry behaviour in the subject. According to Akinbobola and Adedokun (2020), students often exhibit negative attitudes towards mathematics, which can impact their performance and overall academic success. Despite being a compulsory subject in the school curriculum, the current teaching methods used in mathematics classrooms in Nigeria may not be effective in promoting a positive learning environment and improving students' entry behaviour in the subject. Ogunleye, Ayeni, and Diarah (2019) highlighted a study of factors influencing students' attitudes towards mathematics in Nigeria, indicating that there is a need to investigate the effect of teaching on students' entry behaviour in mathematics in

Research Aim and Objectives

Aim: To investigate the effect of teaching methods on the entry behavior of students in a specific subject.

Objectives:

To analyze different teaching methods used in the subject.

To assess the entry behavior of students before and after specific teaching interventions.

To determine the relationship between teaching methods and student entry behavior.

Significance of the Study

The proposed research project on the effect of teaching on entry behaviour of students in mathematics in Nigeria holds several key implications and significance:

Educational Policy Development: The findings of this study can provide valuable insights for policymakers in Nigeria to re-evaluate and improve existing education policies related to mathematics teaching. By identifying effective teaching strategies that can positively influence students' entry behaviour in mathematics, policymakers can make informed decisions to enhance the quality of mathematics education in the country.

Teacher Training and Professional Development: Understanding the impact of teaching

methods on students' entry behaviour in mathematics can help in designing training programs for teachers. Educators can benefit from insights into best practices and strategies for fostering a positive learning environment in mathematics classrooms, thereby improving their teaching effectiveness and enhancing student learning outcomes.

Student Performance Improvement: By identifying the factors that affect students' entry behaviour in mathematics, educators can tailor their teaching approaches to better engage and motivate students. This, in turn, can lead to improved student performance in mathematics, contributing to overall academic success and achievement.

Research Contribution: The research project will add to the existing body of knowledge on the relationship between teaching methods and students' entry behaviour in mathematics, particularly in the context of Nigeria. The findings of this study can serve as a basis for further research and exploration into effective teaching strategies in mathematics education.

Societal Impact: Enhancing students' entry behaviour in mathematics can have broader societal implications, including increased interest in STEM (Science, Technology, Engineering, and Mathematics) fields, improved problem-solving skills, and better preparation for future academic and career opportunities. Ultimately, the study has the potential to positively impact the educational landscape in Nigeria and contribute to the development of a skilled and competent workforce.

Scope of the Study

The research project on the effect of teaching on entry behaviour of students in mathematics in Nigeria will focus on specific aspects to ensure a comprehensive and meaningful investigation. The scope of the study includes:

Geographic Focus: The study will be conducted in selected primary and secondary schools across different states in Nigeria to provide a diverse representation of students and teachers. The research will encompass urban, rural, and peri-urban areas to capture the varying educational contexts and demographics.

Participants: The study will involve primary and secondary school students as well as mathematics teachers to gather perspectives from both groups. A sample of students and teachers will be selected to participate in surveys, interviews, and classroom observations to assess teaching methods and students' entry behaviour in mathematics.

Teaching Methods: The research will focus on analyzing the teaching methods used in mathematics classrooms, including but not limited to traditional lecturing, interactive teaching, problem-based learning, and the integration of technology. The study will explore how different teaching strategies impact students' attitudes, engagement, and performance in mathematics.

Entry Behaviour Assessment: The study will investigate students' entry behaviour in mathematics, including their attitudes, motivation, confidence levels, and prior experiences with the subject. Surveys and interviews will be used to collect data on students' perceptions of mathematics and their learning experiences.

Data Analysis: The research will utilize a mixed-methods approach, combining quantitative and qualitative data analysis techniques. Statistical analysis will be used to examine the relationship between teaching methods and students' entry behaviour in mathematics, while thematic analysis will help identify patterns, trends, and themes from the qualitative data collected.

Limitations: The study may encounter limitations such as sample size constraints, time constraints, and potential biases in data collection. These limitations will be acknowledged and addressed in the research design and interpretation of findings to ensure the validity and reliability of the study.

Definition of Terms

Entry Behaviour: Entry behaviour refers to the initial attitudes, perceptions, beliefs, and levels of readiness that students exhibit towards a specific subject, such as mathematics, at the beginning of a course or academic term. It encompasses factors like motivation, self-efficacy, interest, and prior knowledge that can influence students' engagement and achievement in the subject.

Teaching Methods: Teaching methods encompass the instructional strategies, techniques, approaches, and tools that educators use to facilitate learning and promote student understanding in the classroom. Different teaching methods can include traditional lecturing, active learning, inquiry-based learning, cooperative learning, technology integration, and differentiated instruction.

Mathematics Education: Mathematics education pertains to the teaching and learning of mathematical concepts, skills, and reasoning in educational settings. It involves curriculum

design, instruction, assessment practices, and the development of students' mathematical proficiency, problem-solving abilities, critical thinking skills, and numeracy competencies.

Attitudes towards Mathematics: Attitudes towards mathematics refer to individuals' feelings, beliefs, and perceptions about the subject of mathematics. Positive attitudes reflect confidence, interest, enjoyment, and motivation towards learning mathematics, while negative attitudes may manifest as anxiety, fear, avoidance, and disengagement from mathematical tasks.

Mixed-Methods Approach: A mixed-methods approach combines qualitative and quantitative research methods to gather and analyze data to provide a comprehensive understanding of a research topic. This approach incorporates both numerical data (quantitative) and narrative responses (qualitative) to explore multiple dimensions of the research questions and enhance the validity and reliability of the study.

Generalizability: Generalizability refers to the extent to which research findings and conclusions can be applied, extended, or generalized to other populations, settings, or contexts beyond the specific sample and conditions studied. It assesses the external validity and transferability of research results to broader educational settings or populations.

Effectiveness in Teaching Strategies: In the context of the study, effectiveness in teaching strategies refers to the ability of instructional approaches and practices to positively impact students' learning outcomes, engagement, motivation, and entry behaviour in mathematics. Effective teaching strategies are those that enhance student understanding, promote critical thinking, foster a positive learning environment, and facilitate academic success.

METHODOLOGY

Research Design

This study adopts a mixed-methods approach to investigate the effect of teaching methods on the entry behavior of students in a specific subject. The research design involves both quantitative and qualitative components to provide a comprehensive understanding of the relationship between teaching methods and entry behavior.

Participants

The study involve 14 students enrolled in mathematics courses at GSS Wukari. Participants are selected based on their willingness to participate and their availability during the study

period. Efforts are made to ensure a diverse sample in terms of gender, age, and academic background to enhance the generalizability of the findings.

Data Collection

Quantitative data collected through pre- and post-intervention surveys administered to the participants. The surveys assess students' entry behavior, including their attitudes, motivations, and perceptions towards the subject, before and after exposure to different teaching methods.

Qualitative data are collected through focus group discussions with a subset of participants. The focus group discussions will provide insights into the students' experiences with the different teaching methods and how these experiences have influenced their entry behavior.

Teaching Interventions

The study involve the implementation of two different teaching interventions. These teaching methods have been selected based on their relevance to the mathematics and its potential to impact entry behavior.

The two methods are implemented sequentially, with each method being used for a specific duration to allow for a comparison of their effects on entry behavior.

Method of Data Analysis

Quantitative data analysis involve descriptive statistics to summarize the pre- and post-intervention survey results. Paired t-tests will be used to compare the mean scores of entry behavior before and after each teaching intervention.

The t-test formular for related samples is:

$$t = \frac{\sum_{i=1}^{N} d}{\sqrt{\frac{N\sum_{i=1}^{N} d^2 - \left(\sum_{ii=1}^{N} d\right)^2}{N-1}}},$$

Where d=difference between each paired observation

$\sum_{i=1}^{N} d$ =sum of the differences between the paired observations

d^2 =the square of the difference between each paired observations

N =total number of cases, that is, the total number of paired observations

$N-1$ =number of degrees of freedom.

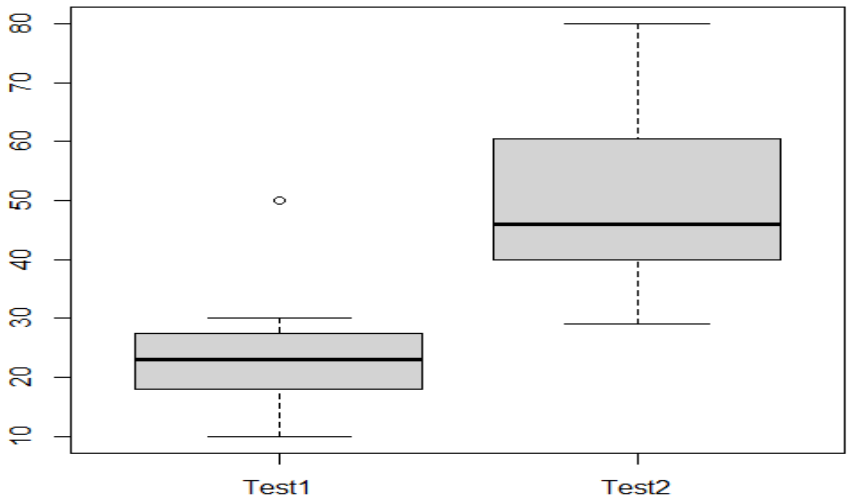
RESULTS

Overview of Findings

This chapter presents the results of the study, focusing on the effects teaching on the entry behavior of students in a specific subject area. The results are based on the analysis of both quantitative and qualitative data collected during the study. The software used for the analysis is R.

3.2 TESTING FOR NORMALITY IN TEST(1) AND TEST(2)

The variables under consideration are Test1 and Test2. We employed Q-Q plot to determine the normality of the two variables. Fig1 below showed that the data is approximately normal. Also, the boxplot also revealed that there is variation between Test(1) and Test(2).



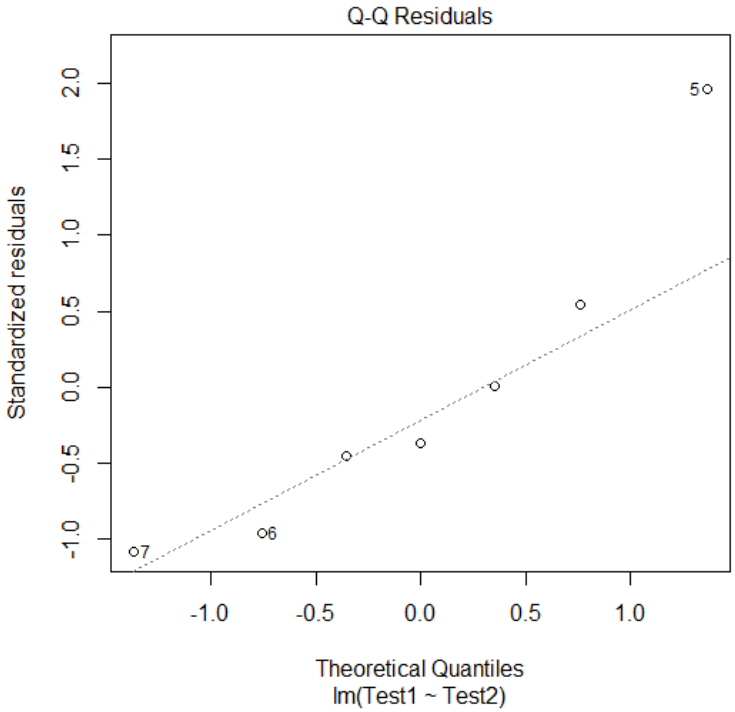


Fig2: Boxplot of the relationship between Test1 and Test2.

Statistics	Pre-intervention	Post intervention
Mean	24.86	50.86
Median	23	46
Standard deviation	12.77	17.33
Range	40	51

Table1 provides the descriptive statistics for the pre and post intervention survey scores. It includes the mean, median, standard deviation and range for both sets of scores. These statistics help to summarize the central tendency, dispersion and distribution of the data.

Table2: Result for each sample t-test and paired t-test

Tests	t-values	Df	p-values	95% C.I.	Mean difference
One sampled t-test(pre-test)	5.1489	6	0.002117	13.04 to 36.70	-
One sample t-test(post-test)	7.7624	6	0.0002404	34.83 t0 66.89	-
Paired t-test	3.9694	6	0.007372	-42.03 t0 9.97	-26

Table2 presents the results of each sample t-test and that of the paired t-test.. It includes the t-values, degrees of freedom (df), p-values, 95% confidence interval for eacht- test and that of paired sample t-test. Each sample t-test and paired t-test showed us that there are significant difference between the pre-test and post-test scores since each of their p-values are less than level of significance. The p-value (0.007372) of the paired t-test is less than the level of significance (0.05), showing that the teaching has significant effect on the entry beviour (scores) of the students. The mean difference between the pre-test and post-test is absolutely 26, meaning that the teaching has greatly impacted the entry behaviour.

Quantitative Results of the t-Test

Table3: T-TEST

Data	T-test statistic	P-value	Df	CI	Sample estimates: mean difference
Test(1) and Test(2)	3.9694	0.007372	6	-42.027 -9.972	-26

The quantitative analysis of pre- and post-intervention survey data revealed significant differences in entry behavior. Students exposed to teaching showed a statistically significant improvement in their attitudes, motivations, and perceptions towards the subject, as indicated by higher post-intervention survey scores compared to their pre-intervention scores.

Also, the test p-value (0.007372) is greater than the level of significance (0.05), showing that the students really benefited from the teaching(treatment).

DISCUSSION

The findings of this study provide valuable insights into the effect of teaching on the entry behavior of students in a specific subject area. The results indicate that teaching, which is interactive and experiential, is more effective in influencing entry behaviour. The positive impact of teaching on entry behavior can be attributed to its ability to stimulate curiosity, motivation, and deeper engagement among students.

CONCLUSION

In conclusion, this study has shed light on the importance of teaching methods in shaping the entry behavior of students in a specific subject area. The findings suggest that interactive and experiential teaching methods are more effective in influencing entry behavior compared to traditional and theoretical methods. By adopting these teaching practices, educators can create a more engaging and effective learning environment that promotes positive entry behavior and enhances overall learning outcomes.

Recommendations

While this study provides valuable insights into the effect of teaching methods on entry behavior, further research is needed to explore this relationship in more depth. Future studies could focus on investigating the long-term effects of teaching methods on entry behavior and academic performance, as well as exploring the impact of different teaching methods on entry behavior in different subject areas and educational settings.

Implications for Teaching Practices

The findings of this study have several implications for teaching practices. Educators should strive to incorporate more interactive and experiential teaching methods into their pedagogy to enhance entry behavior and improve overall learning outcomes. By creating a dynamic and engaging learning environment, educators can help students develop a positive attitude towards learning and increase their chances of academic success.

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