Journal of Studies in Science and Mathematics Education
ISSN: 2630-662x
Published: 10.08.2026
Volume (issue): 6(1)
Page: 119–128

Effects of Mobile Learning and Self-Study Package on NCE Students' Mathematics Achievement and Motivation

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Abstract

Improving students' achievement and motivation in Mathematics remains a major concern in mathematics education, particularly in Colleges of Education where conventional lecture methods often fail to promote active learning. This study investigated the effects of mobile learning and a self-study package on the mathematics achievement and motivation of Nigeria Certificate in Education (NCE) students in North-Central Nigeria. Using a quasi-experimental pretest–posttest non-equivalent control group design, 153 students were assigned to mobile learning, self-study package, and lecture method groups. Data were collected using a validated Mathematics Achievement Test (KR-20 = .79) and a motivation questionnaire. Descriptive statistics (mean and standard deviation) and Analysis of Covariance (ANCOVA) were used to analyze the data at the .05 significance level. The findings indicated that both mobile learning and the self-study package significantly improved students' Mathematics achievement and motivation compared with the lecture method ($p < .05$). The self-study package produced the highest gains in achievement while mobile learning gained higher motivation also demonstrated substantial effectiveness in enhancing students' engagement with Mathematics. The study concludes that learner-centred instructional approaches are more effective than conventional teaching methods in improving Mathematics learning outcomes. The findings support the integration of mobile learning and self-study packages into Mathematics instruction and provide evidence for adopting innovative pedagogies to enhance Mathematics education in Colleges of Education.

Keywords: mobile learning, self–study package, achievement, motivation, college of education

1 Introduction

Mathematics occupies a central position in science, technology, innovation, and national development. It provides the foundation for logical reasoning, scientific inquiry, problem-solving, and technological advancement, making it indispensable across disciplines such as engineering, medicine, computing, finance, and the natural sciences (Krauss, 2024). Beyond its academic value, Mathematics is embedded in everyday activities, including measurement, commerce, budgeting and decision-making. Consequently, proficiency in Mathematics is a prerequisite for admission into most tertiary education programmes in Nigeria and serves as a key determinant of students' academic and career opportunities. In teacher education, particularly in Colleges of Education, Mathematics plays an even more critical role because these institutions prepare future teachers who are expected to possess strong conceptual understanding and effective pedagogical skills for classroom practice (Murray & Thomas, 2023). The rapid advancement of information and communication technologies has transformed teaching and learning worldwide. Mobile technologies, including smartphones, tablets and educational applications, have become powerful instructional tools that support flexible, interactive and learner centred learning environments (Brew et al., 2023). Their widespread accessibility allows learners to engage with educational content anytime and anywhere, thereby promoting independent learning, collaboration, creativity and digital literacy (Zhou et al., 2025).. The COVID-19 pandemic further accelerated the adoption of digital technologies in education and demonstrated the importance of technology supported learning for ensuring continuity of instruction. As educational systems continue to embrace digital transformation, integrating mobile learning into Mathematics instruction presents opportunities to improve students' learning experiences and academic outcomes.

Alongside mobile learning, self-study has gained considerable attention as a learner centred instructional strategy. Self-study packages encourage learners to take responsibility for their own learning by allowing them to study at their own pace, monitor their progress and revisit difficult concepts whenever necessary. Such approaches promote learner autonomy, self-

regulation, critical thinking and deeper conceptual understanding (Das, 2021; Roul, 2020). Recent studies have also shown that technology supported self-study environments enhance students' motivation, confidence and academic resilience by providing personalized learning opportunities that accommodate individual learning differences (Chen et al., 2023). These learner centred approaches are increasingly recognized as effective alternatives to conventional teacher centred instructional method. Despite the recognized importance of Mathematics and the growing availability of innovative instructional technologies, students' achievement and motivation in Mathematics remain major concerns in Nigerian Colleges of Education. Academic records from selected Colleges of Education in North-Central Nigeria indicate persistently low achievement in trigonometry courses, with pass rates declining considerably over recent academic sessions. Previous studies have attributed this poor performance partly to the continued reliance on the conventional lecture method (Maamin, 2020; Belbase, 2016), this often encourages passive learning, limits students' engagement, and provides few opportunities for individualized learning and meaningful interaction. Low motivation, inadequate self-study habits, and insufficient opportunities for active participation have also been identified as factors contributing to poor learning outcomes in Mathematics (Iwuanyanwu, 2021).

Several empirical studies have reported positive effects of mobile learning and other technology enhanced instructional approaches on students' achievement and motivation across different educational settings. Similarly, self-study strategies have been found to improve learners' independence, confidence and conceptual understanding (Saha et al., (2024). However, most of these studies have been conducted in secondary schools, universities, or disciplines other than Mathematics with relatively few focusing on Colleges of Education in Nigeria. More importantly, limited empirical evidence exists comparing the effectiveness of mobile learning and self-study packages simultaneously on both Mathematics achievement and motivation among Nigeria Certificate in Education (NCE) students. This gap limits evidence based decisions regarding the adoption of innovative instructional approaches in Colleges of Education particularly within North-Central Nigeria. To address this gap, this study investigated the effects of mobile learning and self-study packages on the achievement and motivation of NCE I Mathematics students in Colleges of Education in North-Central Nigeria. Specifically, the study sought to determine the effects of mobile learning and self-study packages on students' Mathematics achievement and to examine their effects on students' motivation toward learning Mathematics.

The study was guided by the following research questions:

i. What is the difference in the mean achievement scores of NCE I Mathematics students taught using mobile learning, self-study package and lecture method?

ii. What is the difference in the mean motivation scores of NCE I Mathematics students taught using mobile learning and those taught using a self-study package?

The findings of this study are expected to contribute to the growing body of knowledge on technology enhanced and learner centred instructional strategies in Mathematics education. The study will provide empirical evidence to assist Mathematics educators in selecting effective teaching approaches that enhance students' achievement and motivation. The findings may also guide curriculum developers and educational policymakers in integrating mobile learning and self-study packages into Mathematics instruction in Colleges of Education. Furthermore, the study offers valuable insights for educators and researchers seeking to improve instructional practices and advance research on innovative pedagogies in mathematics and science education.

2 Literature Review/Theoretical Framework

This study is anchored on Constructivist Learning Theory and Self-Directed Learning Theory (SDL). Collectively, these theories explain how the Self-Study Package (SSP) approach can improve mathematics practice skills, academic achievement, and learning motivation among NCE I students. Constructivist Learning Theory posits that learners actively construct knowledge through meaningful engagement with learning activities rather than passively receiving information. Within mathematics education, this implies that students develop conceptual understanding and problem-solving competence by interacting with mathematical tasks, reflecting on their experiences and connecting new knowledge with prior understanding. The Self-Study Package operationalizes this principle by providing structured learning activities, guided exercises and opportunities for repeated practice that enable learners to construct mathematical knowledge independently. Self-Directed Learning Theory further explains that effective learners assume responsibility for planning, implementing and evaluating their own learning. Mobile Leaning and Self-Study Package encourages learners to determine their pace of study, identify learning needs, complete structured activities and evaluate their progress through self-

assessment exercises. Together, these theories provide a comprehensive framework for explaining how Mobile Learning and Self-Study Package enhances mathematics learning. Constructivism explains active knowledge construction; Self-Directed Learning explains learner autonomy. Consequently, the framework suggests that learners who actively engage with structured instructional materials, collaborate with others, assume responsibility for their learning, and regulate their learning processes are more likely to demonstrate improved higher academic achievement, greater motivation, stronger problem-solving ability, and increased instructional readiness.

This theoretical position is supported by existing empirical evidence. Academic achievement has long been recognised as a major indicator of educational success, reflecting the extent to which learners acquire the knowledge, skills, and competencies required for effective performance (Yemi, 2018). Achievement is influenced by instructional strategies, learner motivation, cognitive ability, learning resources and the educational environment (Umar et al., 2020). These determinants are consistent with Constructivist and Self-Directed Learning theories, which emphasize that meaningful learning results from active engagement with appropriate instructional experiences supported by effective regulation of cognitive and motivational processes. Motivation is another critical factor influencing students' achievement. Swann et al. (2021) argue that motivation determines learners' choice of learning activities, the effort invested, and persistence in completing academic tasks. Likewise, Motervalli et al. (2020) describe motivation as the process through which goal-directed learning activities are initiated and sustained. Their categorization of motivation into intrinsic, extrinsic, introjected, and identified motivation aligns closely with Self-Directed theory, which emphasize learners' responsibility for sustaining engagement and persistence throughout the learning process. Therefore, instructional approaches that encourage learner autonomy and self-monitoring are expected to strengthen both motivation and achievement.

Empirical studies further demonstrate the effectiveness of learner centred and technology supported instructional approaches. For example, Jimoh et al. (2019) reported significant improvements in Mathematics students' achievement and motivation following Skype-based instruction. Similarly, Skillen (2021) found that mobile learning through smartphones and tablets enhanced students' engagement, motivation, and mathematics learning outcomes. These findings support the assumptions of Constructivist Learning Theory by showing that interactive learning environments encourage active participation and deeper conceptual understanding. Comparable evidence has been reported beyond mathematics. Jeno et al. (2017), using a quasi-experimental design involving undergraduate biology students in Norway, found that learners who used the ArtsApp mobile application achieved significantly higher intrinsic motivation, perceived competence and academic achievement than those who relied on traditional textbooks. These findings are consistent with Self-Directed theories because mobile learning environments provide learners with greater control over learning pace, increased opportunities for self-assessment and immediate feedback that enhances learning regulation. However, the study differs from the present research in subject area, educational level, instructional intervention, and geographical context.

Despite the growing body of evidence supporting technology enhanced learning and learner centred instructional approaches, important gaps remain. Most previous studies have focused on mobile learning applications or other digital instructional technologies, while relatively little attention has been given to structured Self-Study Package strategies designed to promote independent practice and self-regulated learning in mathematics. Furthermore, many existing studies have been conducted outside Nigerian Colleges of Education, limiting the generalisability of their findings to Colleges of Education. There is also limited empirical evidence examining the combined influence of mobile learning and Self-Study Package strategies on both academic achievement and learning motivation in trigonometry among NCE I Mathematics students in North-Central Nigeria. The present study addresses these gaps by investigating the effects of mobile learning and the Self-Study Package approach on students' achievement and motivation in trigonometry. Guided by Constructivist Learning Theory and Self-Directed Learning Theory, the study seeks to provide empirical evidence on how structured independent learning, supported by mobile technology and collaborative learning opportunities, can improve mathematics learning outcomes among NCE I students in Nigerian Colleges of Education.

3 Methodology

The study adopted a pre-test post-test quasi-experimental research design. The population comprised all fifteen (15) public Colleges of Education in North-Central Nigeria, with a total population of 44,663 NCE I Mathematics students enrolled in Mathematics related courses. A multi-stage sampling technique was employed. Three Colleges of Education were randomly selected and assigned to three groups: Experimental Group I (Mobile Learning), Experimental Group II (Self-Study Package), and a Control Group (Conventional Lecture Method). Since random assignment of individual participants was not feasible, intact classes were used, resulting in a sample of 153 NCE I Mathematics students. Data were collected using

the Mathematics Achievement Test (MAT), a 40-item multiple choice instrument developed from selected trigonometry topics, including applications of SOHCAHTOA, trigonometric identities and trigonometric ratios. The instrument was validated by three Mathematics experts from the Federal College of Education, Zuba, and one senior lecturer in Mathematics Education from the Federal University of Education, Kontagora. A pilot study established the reliability of the instrument using the split-half method, yielding a Kuder–Richardson Formula 20 (KR-20) reliability coefficient of 0.79. Ethical approval was obtained from the relevant institutional research ethics committee, while permission and informed consent were secured from the participating institutions and students. Participants were assured of confidentiality, anonymity and their right to withdraw from the study at any stage without penalty.

The MAT was administered as a pre-test before the commencement of the three weeks intervention. Experimental Group I received instruction through Mobile Learning, Experimental Group II used the Self-Study Package, while the Control Group was taught using the conventional Following the treatment, Two questionnaires were designed and developed by the researcher on Mobile learning Motivation Questionnaire (QONMSMT-ML) and Self-study package Motivation Questionnaire (QONMSMT-SSP). The two questionnaires consist of twenty questions each. Each of the questionnaire consist of two segments; A and B; Segment A, required the Bio data of students, such as, Name of college and state while segment B consist of statements on their opinions about Mobile learning and Self-Study package. The questionnaires were administered to the groups to test the motivation level of the students before and after they must have been exposed to the treatment. The questionnaires consisted of twenty (20) items based on five-point likert Scale namely Highly Motivated (HM) which is 5 points, Motivated (M) which is 4 points, Moderately Motivated (MM) which is 3 points, Slightly Motivated (SM) which is 2 points and Not Motivated (NM) which carried 1 point. A mean of 3.0 was considered acceptable mean of approval. The test items were also used for trial study on smaller group of students who are part of the population but not part of the sample after being validated by experts from College of Education Minna, to ascertain both face and content validity. The choice of determining face and content validity was to find out if the items in the test measured what it meant to measure and was taken into account as the appropriate type of validity in an achievement. The face and content validation was used to test the clarity, orderliness and appropriateness of the instrument the reliability coefficients of 0.79 and 0.84 were obtained, which shows that the instruments were reliable. Mean and standard deviation were used to answer the research questions, while Analysis of Covariance (ANCOVA) was employed to test the hypotheses at the 0.05 level of significance, controlling for pre-test differences among the groups. Significant effects were further examined using Sidak post-hoc pairwise comparisons. Prior to the analysis, the assumptions of ANCOVA were tested using the Shapiro–Wilk test for normality, Levene's test for homogeneity of variances, and the test of homogeneity of regression slopes. The results confirmed that all assumptions were satisfactorily met.

4 Results

Research Question One: What is the difference in the mean achievement scores of NCE I Mathematics students' taught Mathematics using mobile learning, self-study package and lecture method?

Table **1**

Mean and Standard Deviation of Pre-test and Post-test Mean Scores of mobile learning, self-study package and Lecture Method

Group	N	Pre-test		Post-test		Mean gain
		Mean	SD	Mean	SD	
Mobile Learning	54	39.78	12.58	52.83	14.83	13.05
Self-Study	51	34.22	11.50	51.80	11.57	17.58
Lecture Method	48	32.56	13.68	44.13	15.92	11.57

Table1 presents the mean and standard deviation for pre-test and post-test scores across three instructional strategies: Mobile Learning, Self-Study and Lecture. For the Mobile Learning group (N=54), students' mean scores improved from 39.78 (SD = 12.58) in the pre-test to 52.83 (SD = 14.83) in the post-test, with a mean difference of 13.05. In the Self-Study

group (N=51), students' scores increased from a pre-test mean of 34.22 (SD = 11.50) to a post-test mean of 51.80 (SD = 11.57), resulting in a higher mean difference of 17.58. The Lecture group (N=48) showed an increase from a pre-test mean of 32.56 (SD = 13.68) to a post-test mean of 44.13 (SD = 15.92), with a mean difference of 11.57. These results indicate that the Self-study strategy yielded the highest improvement in mean scores, followed by Mobile Learning and then the Lecture method.

Research Question Two: What is the difference in the mean motivation scores of NCE I Mathematics students taught using mobile learning and those taught using a self-study package?

Table **2**

Mean and Standard Deviation of the Motivation of NCE I Mathematics students' taught Mathematics using mobile learning and self-study package.

Group	N	Pretest Mean	Pretest SD	Posttest Mean	Posttest SD
Mobile Learning	54	85.48	4.15	91.22	2.81
Self-Study Package	51	86.78	3.54	90.33	2.47

Table 2: presents the mean and standard deviation of motivation scores among NCE I Mathematics Students the descriptive statistics indicate that the Mobile Learning group (n = 54) had a pretest mean motivation score of 85.48 (SD = 4.15**)**, while the Self-Study Package group (n = 51) had a slightly higher pretest mean of 86.78 (SD = 3.54**)**. Following the intervention, the Mobile Learning group obtained a higher posttest mean motivation score **(**M = 91.22, SD = 2.81**)** than the Self-Study Package group **(**M = 90.33, SD = 2.47**).** The reduction in standard deviations at posttest suggests that students' motivation scores became more consistent after the treatment. Suggesting that NCE I Mathematics Students" taught with the Mobile Learning strategy demonstrated slightly higher motivation compared to those taught with Self-Study Package.

Hypothesis One: There is no significant difference in the mean achievements scores of NCE I Mathematics students' taught Mathematics using Mobile Learning, Self- Study Package and those taught using Lecture Method.

Table **3a**

Summary of the Analysis of Covariance (ANCOVA) of Post-test Achievement Scores of Mobile Learning, Self-Study Package and Lecture Method.

Source	Type III Sum of Squares	df	Mean Square	F-value	p-value	Partial Eta Squared
Corrected Model	25478.538[a]	3	8492.846	179.608	<.001	.783
Intercept	3529.909	1	3529.909	74.651	<.001	.334
Pretest	23231.275	1	23231.275	491.300	<.001	.767
Groups	985.690	2	492.845	10.423	<.001	.123
Error	7045.514	149	47.285			
Total	411333.000	153				
Corrected Total	32524.052	152				

a. R Squared = .783 (Adjusted R Squared = .779)

Table 3a: shows the ANCOVA comparison of Post-test Scores of Mobile Learning, Self-study Package and Lecture Method). An examination of Table 3a with F (2,149) = 10.423, p < .001, the result of the analysis indicates that this hypothesis is rejected on the basis that the main effect (treatment) was significant. The results revealed that Mobile Learning, Self-Study Package and Lecture Method) produced a significant effect on the achievement scores of students when covariate effect (pretest) was controlled. The result indicates that the treatment, using Mobile Learning, Self-Study Package and Lecture Method), accounted for the difference in the post-test achievement scores of the students. This implies that a statistically significant difference exists among the three groups of Mobile Learning, Self-Study Package and Lecture Method. Since it was established that there was a significant difference in the mean of combined Mobile Learning and Self-

Study Package on Mathematics achievement of NCE I Mathematics students, Sidak test post-hoc analysis was done to identify the direction of the difference among the treatment groups as shown in Table 3b.

Table **3b**

Sidak Post-hoc Analysis of Post-test Achievement Scores of Students in Mobile Learning, Self-Study Package and Mobile Learning.

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.[b]
Mobile Learning	Self-Sudy Package	-4.465*	1.365	.004
	Lecture Method	1.580	1.401	.597
Self-Study	Mobile Learning	4.465*	1.365	.004
	Lecture Method	6.046*	1.385	.000
Lecture Method	Mobile Learning	-1.580	1.401	.597
	Self-Study Package	-6.046*	1.385	.000

Based on estimated marginal means.
*. The mean difference is significant at the 0 .05 level. b. Adjustment for multiple comparisons: Sidak.

The data in Table 3b indicates significant difference in the posttest mean scores of Self-Study Package and Lecture methods with p-value of 0.00. There was significant difference between Mobile Learning and Self-Study Package with p-value of 0.04. Also, there was significant difference between Lecture Method and Self-Study Package with p-value of 0.00. There was no significant difference between Mobile Learning and Lecture Method with p-value of 0.597. Significant difference was established between Self-Study Package and Lecture Method with p=value of 0.0. Finally, no significant difference between Lecture Method and Mobile Learning with p-value of 0.597.

Hypothesis Two: There is no significant difference in the mean motivation scores of NCE I Mathematics students' taught mathematics using mobile learning and those taught using self-study package.

Table **4**

Summary of the Analysis of Covariance (ANCOVA) on Motivation scores of NCE I Mathematics students' taught Mathematics with Mobile Learning and Self-Study Package

Source	Sum of Squares	df	Mean Square	F-value	p-value
Corrected Model	187.10	2	93.55	16.51	<.001
Pretest (Covariate)	144.77	1	144.77	25.55	<.001
Treatment (Group)	42.33	1	42.33	7.47	.007
Error	577.89	102	5.67		
Total	870755.00	105			
Corrected Total	764.99	104			

Table 4 presents the ANCOVA results comparing the motivation of NCE I Mathematics students' taught Mathematics using Mobile Learning and Self-Study Package. It revealed that, after controlling for pretest motivation scores, there was a statistically significant effect of treatment on students' posttest motivation, $F(1, 102) = 7.47$**,** $p = .007$**.** The pretest motivation score was also a significant covariate, $F(1, 102) = 25.55$**,** $p < .001$, indicating that students' initial motivation significantly predicted their posttest motivation. Since the probability value for treatment **(**$p = .007$**)** is less than the 0.05 level of significance, the null hypothesis is rejected**.** This indicates that there was a significant difference in students' motivation between those taught using the Mobile Learning approach and those taught using the Self-Study Package after adjusting for their pretest motivation scores. The descriptive statistics further show that the Mobile Learning group achieved a slightly higher adjusted posttest motivation than the Self-Study Package group.

5 Discussion and Findings

This study examined the effects of Mobile Learning (ML) and Self-Study Package (SSP) instructional strategies on NCE I students' achievement and motivation in Mathematics in Colleges of Education in North-Central Nigeria. The findings revealed a significant difference in students' achievement scores among the three instructional groups, with the Self-Study Package demonstrating superior effectiveness over both Mobile Learning and the conventional Lecture Method. However, no significant difference was observed between Mobile Learning and the Lecture Method in terms of achievement. These results suggest that the structured, self-paced nature of SSP enhances conceptual understanding more effectively than traditional teacher-centred instruction. The findings are consistent with Abdulmoneim (2018), who reported significant improvements in students' performance when Google educational applications were integrated into instruction compared to traditional methods. Similarly, studies by David (2017), Shaheen (2020), Qaisara et al. (2024), and Achor et al. (2024) affirm that innovative, student-centred and technology-supported instructional approaches significantly improve academic achievement by promoting deeper engagement and conceptual understanding.

Furthermore, the study showed that Mobile Learning group achieved a slightly higher adjusted posttest motivation than the Self-Study Package group. The findings are consistent with Jeno et al. (2017), using a quasi-experimental design involving undergraduate biology students in Norway, found that learners who used the ArtsApp mobile application achieved significantly higher intrinsic motivation and academic achievement than those who relied on traditional textbooks. This implies that both strategies motivated students similarly, likely due to their flexibility, accessibility and engaging learning features. Modern digital learning environments often encourage learner autonomy and self-regulation, which enhances motivation and interest. The findings are consistent with Juan & Visser (2017), who emphasized that digital learning resources play significant roles in sustaining student motivation both at home and at school.Overall, the findings demonstrate that the Self-Study Package is particularly effective in improving student's achievement and motivation in Mathematics, while Mobile Learning also contributes positively to motivation outcomes.

6 Limitations of the Study

This study has some limitations that should be considered when interpreting the findings;

1. The study was conducted in Colleges of Education located within North-Central Nigeria; therefore, the findings may not be generalizable to students in other geopolitical zones or educational contexts,
2. The intervention was limited to selected trigonometry concepts in Mathematics, which may restrict the applicability of the findings to other Mathematics topics or subject areas,
3. The treatment period lasted only three weeks, which may not have been sufficient to capture the long-term effects of Mobile Learning and Self-Study Package interventions on students' achievement and motivation. Future studies should consider broader geographical coverage, longer intervention periods, extended retention assessments, and the inclusion of additional Mathematics topics to enhance the generalizability and robustness of the findings

7 Recommendations

1. Mathematics lecturers in Colleges of Education integrate Mobile Learning and Self-Study Package strategies into their instructional practices to enhance students' achievement and motivation.
2. Curriculum planners incorporate structured self-paced and technology-supported learning resources into Mathematics programmes.
3. Further research be conducted to examine the long-term impact of these strategies across different mathematical topics and student demographics.

8 Implication

1. The study developed and validated instructional resources—Mobile Learning Lesson Plan, Self-Study Package Lesson Plan, Self-Study package, and a 40-item Mathematics Achievement Test (MAT)—to support effective Mathematics teaching and future research.
2. Mobile Learning and Self-Study instructional strategies significantly improved NCE I Mathematics students' achievement and motivation in Mathematics, helping to reduce underachievement.
3. The findings established Mobile Learning and Self-Study strategies as effective alternatives to the conventional lecture method and contributed valuable insights to existing literature.

9 Conclusion

The study concludes that Mobile Learning and Self-Study Package instructional strategies significantly enhance NCE I Mathematics students' academic achievement and motivation in Mathematics compared to the traditional Lecture Method. The Self-Study Package emerged as the most effective strategy. Integrating structured, self-paced, and technology-supported instructional approaches into Mathematics education can improve students' understanding and motivation of complex concepts, particularly in areas such as trigonometry.

10 Declarations

Ethical Statements: Permission to conduct this study was obtained from the management of the participating Colleges of Education before data collection commenced. All participants were informed about the purpose of the study, and their informed consent was obtained prior to participation. Participation was voluntary, and respondents were assured that the information provided would remain confidential and anonymous. Participants were also informed of their right to decline participation or withdraw from the study at any stage without any penalty. The study was conducted in accordance with accepted ethical principles for educational research involving human participants.

Conflict of Interest: The authors declare neither financial nor non-financial conflict of interest.

Author Contributions: **ASI** conceived and designed the study, collected the data, analysed the data and drafted the manuscript. **AAH** supervised the study, contributed to the interpretation of the findings, critically revised the manuscript for important intellectual content, and approved the final version. All authors read and approved the final manuscript and agree to be accountable for all aspects of the work. **AAM** critically revised the manuscript for important intellectual content and approved the final version. All authors read and approved the final manuscript and agree to be accountable for all aspects of the work. **AUB** critically revised the manuscript for important intellectual content and approved the final version. All authors read and approved the final manuscript and agree to be accountable for all aspects of the work.

Funding: The author received no external financial support for the research, authorship and/or publication of this article.

Acknowledgments: The author expresses sincere gratitude to his research supervisors for their invaluable guidance, constructive criticism and continuous encouragement throughout the conduct of this study. Appreciation is also extended to the management, lecturers and NCE I Mathematics students of the participating Colleges of Education in North-Central Nigeria for their cooperation during data collection.

Data Availability Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request. The data are not publicly available because they contain information that could compromise the privacy and confidentiality of the research participants.

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