

Assessment of Innovative Teaching Methods on Students' Retention in Secondary Schools in Kogi State

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Abstract

The study assessed the effect of innovative teaching methods on students' retention in sec. schools in Kogi State Nigeria. Persistent concerns about declining learning outcomes and weak retention among secondary students have call for pedagogical innovation. Innovative teaching methods has a significant role in students learning retention that will cater for the individual differences in the classroom. A quasi-experimental research design was adopted using non-equivalent control groups. The sample consisted of 480 senior SS III drawn from six public secondary schools across the three senatorial zones of Kogi State. Data were collected using the Teaching Methods Questionnaire (TMQ) and a Students' Retention Test (SRT) administered immediately after instruction & six weeks later. Reliability coefficients of 0.73 (TMQ) and 0.85 (SRT) were obtained. Data were analyzed using descriptive statistics and Analysis of Covariance (ANCOVA). The findings revealed a statistically significant difference in retention between students taught using innovative teaching methods and those taught using traditional lecture methods. The study concludes that innovative teaching methods significantly enhance students' retention and highlights the critical role of instructional leadership in supporting effective pedagogical practices.

Keywords: Assessment, Innovative teaching methods, student retention, secondary education, educational management.

Introduction

Innovative teaching methods become imperative in the process of teaching and learning in the 21st century because of the relevance of technology in real life day to day activities. There is need to redefine and redesign teaching method among teachers to enhance students learning

retention. Student retention remains a major challenge in Senior Secondary education systems particularly in developing countries where instructional practices are often dominated by teacher-centered approaches. Retention refers to learner's ability to recall and apply knowledge over time and is a critical indication of instructional effectiveness. In Kogi State, concerns have been raised regarding students' inability to retain concepts beyond immediate examinations and tests, especially at Senior Secondary level.

Innovative teaching methods have been widely promoted as effective strategies for improving learning outcomes and retention. These methods include cooperative learning, problem-based learning, digital assisted instruction and inquiry-based teaching emphasize active student engagement, collaboration and deeper cognitive processing. From educational management and leadership perspective, the adoption of innovative teaching practices requires strategic planning, teacher professional development & sustained instructional supervision.

Recent studies carried out by Shola (2022) shows that innovative teaching methods enhance students learning retention through active learning, incorporating game like elements such as quizzes, connecting theory to practice through hands on activities and simulations, multisensory learning through the use of multiple senses for instance visual, audio, visual-audio and also through collaborative learning. Since the classrooms is filled with students having a diversity of age, gender, exposure, language and family backgrounds, to facilitate all these students with individual differences under the same a roof, a teacher has to adapt curriculum and lesson delivery that will bring innovation to the teaching methods

Statement of Problem

Despite the numerous benefits of innovative teaching methods in education, most teachers are still finding it difficult to adapt and explore these methods in learning process which in turn has made students passive in the classroom and poor learning retention. In Kogi State empirical evidence on the effectiveness of innovative teaching methods in improving students' retention remains limited. The study therefore assessed the effect of innovative teaching methods on students' retention in Senior Secondary school with particular attention to the implications for instructional leadership and School Management.

Research objectives

- Determine the effect of innovative teaching methods on students' retention in Secondary schools in Kogi State.
- Examine the difference in retention levels between students taught using innovative teaching methods and those taught using traditional lecture methods after controlling for pretest scores.

Research Questions

- What is the effect of innovative teaching methods on students' retention in Secondary Schools in Kogi State.?

- What are the difference in retention levels between students taught using innovative method and that of traditional lecture method after controlling for pretest scores?

Null Hypotheses

H₀₁: There is no significance difference in the mean retention scores of students taught using innovative teaching methods and those taught using traditional methods after controlling for pretest retention scores in secondary schools in Kogi state.

H₀₂: Pretest retention scores do not significantly influence post-test retention scores of students in sec. schools in Kogi state.

Literature Review

Innovative Teaching Methods

Innovative teaching methods are instructional approaches that shift the focus of learning from the teacher to the learner, promoting interaction, critical thinking and meaningful engagement (Fatokun 2024).

Remya (2022) opines that innovation in teaching learning helps a teacher to work with the potential to achieve great success. It redefines the need to produce a generation that is independent, confident and innovative. He went further to state that students are the backbone of the nation and the onus is on the teacher to develop skills and update their knowledge on what should be important for them and how they can see success in their future endeavors. The focus of innovative teaching methodology should be based on the trust that every student has the capacity to learn and be successful in life and as such teacher should perceive each student as possessing unique personality characteristics that can be more polished by using creative and innovative teaching methods (Fatokun, 2024). However, Albert (2023) opines that in this era of science and technology, following the scientific method one would have the first interest to know about strategies to be adopted, what are their applications and what are the best innovative teaching methods or strategies to address students' diversity or difference?

Okpala (2022) defines innovative teaching methods as a constant pursuit of the oldest technology in educational trends that embody distinctive approaches to the teaching and learning process. He further argues that these methods of teaching prioritize students, emphasizing classroom engagement and interaction, it is in agreement with a research conducted by Stephen (2023) that innovative strategies encourage proactive participation and collaboration among students and teacher. In contrast to conventional teaching methods which measures students' success by the amount of knowledge transferred to students whereas innovative teaching methods become important because educational landscape has undergone a transformation transitioning from traditional classrooms to virtual and hybrid learning environment that trigger innovative methods of teaching.

Yusuf (2023) page 33-37 explains the key characteristic of innovative teaching methods or strategies as follows:

- Student-centric focus: Innovative teaching methods or strategies prioritize the needs and engagement of students, fostering active participation in the learning process.
- Active learning: Encourages hands and participatory activities, moving away from passive learning to promote deeper understanding and retention
- Flexibility and adaptability: Innovative teaching methods help students to adapt to the diverse learning styles and needs of students, offering flexibility in content delivery and new teaching methods.
- Technology integration: Utilizes technology creatively enhance effective learning experiences, incorporating digital tools and resources for effective and interactive instruction.
- Collaborative learning: This emphasizes group work collaboration, and peer learning to enhance social and communication skills among students.
- Problem-solving emphasis: This focuses on developing critical thinking skills and problem-solving skills, challenging students to apply knowledge in real world scenarios.
- Creativity encouragement: Helping students to cultivate a learning environment that stimulates creativity and innovation, allowing students to express themselves and explore new ideas.
- Individualized learning paths: Making students to recognizes and accommodates the diverse learning preferences and pace of individual students, promoting personalized learning experiences.

In another vein, Ajayi (2021) page 110- 120 elaborates the following as some of the innovative teaching strategies or methods that can better student engagement and readiness to learn.

Interactive lessons which involve innovation methods in teaching that actively engage students in learning process, instead of passively receiving information; students participate in activities that require their input and involvement.

- Using virtual reality technology which creates a simulated environment that users can interact with, providing a unique and immersive learning experience. Virtual reality can be used to transport students to virtual worlds that simulate historical events, scientific phenomena or complex concepts.
- Blended learning, it involves an educational approach that combines traditional face to face instruction with online components. It seeks to leverage the strengths of both in person and digital learning to create more flexible and personalized learning strategies and experience.
- 3D Printing which involves creating physical objects layer by layer based on a digital model. In education, 3D printing is utilized to bring concepts to life in a tangible and visual way. Teachers and students can design and print three dimensional models that represent scientific structures, historical artifacts or prototypes. This enhances

understanding by allowing students to interact with physical representations of abstract ideas.

- Project based learning is an instructional methodology that centers around students completing projects that require them to apply their knowledge and skills to real-world challenges. It emphasizes on collaborative learning, fostering critical thinking and problem-solving skills.
- Inquiry based learning is an approach where students actively explore and investigate topics, posing questions and conducting research to construct their understanding. This method encourages curiosity, critical thinking and deeper engagement with the subject matter.
- Using AI in education, Artificial Intelligence in education involves the integration of AI technologies to enhance the learning experience for students and support educators.

Students' Retention

Retention is a major component of effective teaching and learning process. Research suggests that students retain information more effectively when they are actively involved in learning activities that promote understanding rather than rote memorization. Instructional methods that encourage discussion, practice, feedback, and reflection have been shown to enhance long-term retention. Akinbowale (2023) posit that students learning retention is the ability of students to retain and recall knowledge, skills or information overtime after initial learning. It measure how well students can access what they have learned and apply it in different contexts in real world situations. James (2022) opines that retention is influenced by various factors which includes interactive teaching methods, repetition and practice, relevance, cognitive engagement and spaced learning. It concludes by saying effective retention is a key indicator of successful learning and helps build a foundation for future academic or personal growth.

To respond to students at secondary educational level, different innovative teaching and differentiated strategies and methods are being used by the teachers in their classes (Amos, 2022). In recent time, global trends in cultural and economic development have brought forth reforms in educational paradigms. These reforms have been accompanied by changes in the ways educational practitioners or educators design the curriculum. In comparism with subject centered approaches, learner centered approaches and problem centered designs are described as having greater potential to impart students learning. But, nevertheless innovative teaching methods like blended learning, project based learning has also be proven that it has a great impact on students retention. Fatokun (2024) and Haruna (2021) maintain that blended learning is an approach that combines online interaction with traditional classroom method. However, some of the research carried out in recent time by group of researchers' shows that innovative teaching can involve virtual labs: learning activities based on real-life problems, learning environments with equipment, furnishing materials, audiovisual resources and learning guides for students and teacher. All combined with methodologies can promote the use of active teaching techniques that can help teachers develop their students learning abilities. Abdullahi (2023) suggests that in using innovative

teaching methods, teachers are to know students diverse backgrounds, offer students flexibility, variety and choice; make expectations clear, use accessible language and be available and approachable to guide student learning

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Educational Management and Instructional Leadership

Instructional leadership plays an important role in shaping teaching and learning process within schools. School leaders influence instructional quality through curriculum coordination, teacher supervision, professional and monitoring of classroom practices. Effective leadership supports innovation by creating a school culture that encourages experimentation, collaboration and continuous improvement.

Conceptual Framework

The conceptual framework illustrates the relationship between innovative teaching methods and students' retention in secondary schools in Kogi State. Innovative teaching methods

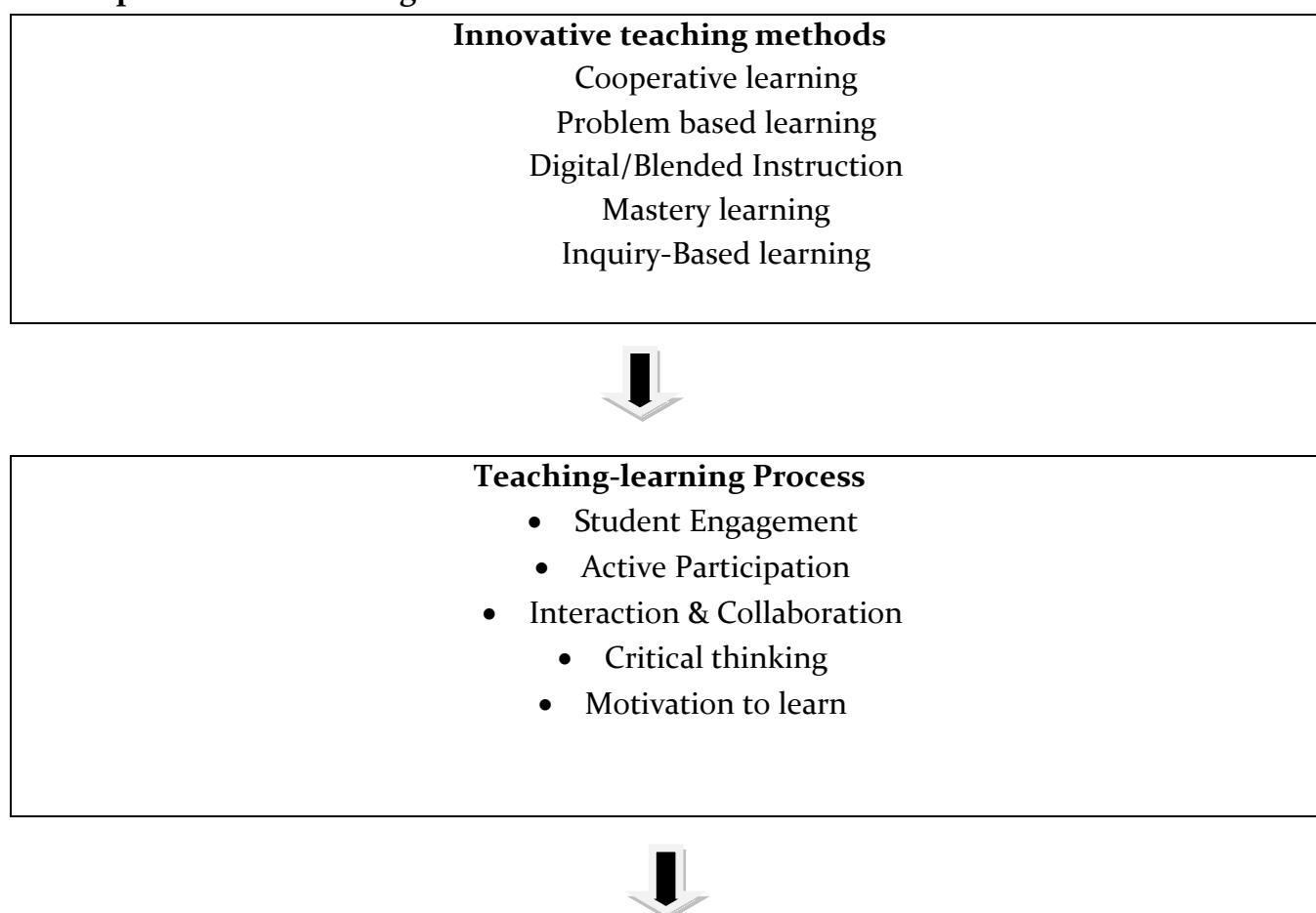
include cooperative teaching methods, cooperative learning, problem-based learning, digital/blended instruction, inquiry-based approaches serve as the independent variables. These methods influence students' retention through teaching and learning processes such as increased student engagement, active participation, collaboration, motivation and critical thinking. These processes act as mediating mechanisms through which instructional strategies translate into improved learning outcomes.

Students' retention, the dependent variable is reflected in learners' ability to recall information, retain knowledge over time and apply learned concepts effectively..

The framework also recognizes the role of moderating variables particularly factors related to educational management and leadership such as school leadership support, teacher competence, availability of instructional resources, and the overall learning environment. All these factors can strengthen or weaken the impact of innovative teaching methods on students' retention.

This study proposes that innovative teaching methods influence students' retention through enhanced teaching and learning processes such as students' engagement, active participation, collaboration, motivation and critical thinking. School leadership support, teacher competence, availability of instructional resources and the learning environment as moderating variables that may strengthen or weaken this relationship.

Conceptual Framework figure 1



Moderating Variable

- School leadership support
- Teacher Competences training
- Availability of instructional resources
- School learning environment

Methodology**Research Design**

A quasi-experimental research design employing non-equivalent control groups was used. This design enables comparison of retention outcomes between students exposed to innovative teaching methods and those taught using traditional lecture methods.

Population and Sample

The population composed all Senior Secondary School III students in public secondary schools in Kogi State. A sample of 480 students was selected from six schools across the Kogi East, Kogi West and Kogi Central using stratified random sampling technique to ensure representativeness.

Instruments: Two Instruments were used:-

- Teaching Methods Questionnaire (TMQ): A 25 item instrument designed to assess the extent to which innovative teaching methods were employed.
- Students' Retention Test (SRT): A 50 item achievement test administered immediately after instruction and seven weeks later.

Validity and Reliability:- Content and face validity were established through expert review by specialists in educational management and measurement. Reliability testing yielded a Cronbach's alpha coefficient of 0.73 for the TMQ and KR20 coefficient of 0.85 for the SRT showing that the instruments were reliable for the study.

Table 1 Validity of Instrument

Instrument	Type of Validity	Validation Procedure	Experts Involved	Remarks
Teaching methods (TMQ)	Content & Face Validity	Review of item relevance/clarity and alignment with objectives	4 experts in educational management and measurement	Valid
Students' Retention Test (SRT)	Content & Face Validity	Item analysis and alignment with objectives	3 subject specialists & measurement expert	Valid

The research instruments were subjected to validity and reliability testing. Content and face validity were established through expert review by specialists in educational management and measurement.

Table 2 Reliability Statistics of Research Instruments

Instrument	Number of Items	Reliability Method	Reliability Coefficient	Decision
Teaching methods Questionnaire (TMQ)	25	Cronbach's Alpha	0.73	Reliable
Students' Retention Test (SRT)	40	Kuder-Richardson (KR-20)	0.82	Reliable

Reliability of the teaching methods questionnaire was determined using Cronbach's alpha coefficient ($\alpha = 0.73$), while the students' test was assessed using Kuder-Richardson formula ($KR-20 = 0.82$). These values indicate that the instruments are reliable for the study

Data Analysis

Data were analyzed using Mean scores, standard deviations, and Analysis of Covariance (ANCOVA) at 0.05 level of significance to determine the effectiveness differences in students retention between the experimental and control groups.

Table 3 Descriptive statistics of students' retention by teaching method

Teaching Method	N	Mean score	Mean deviation	Standard deviation
Innovative teaching experiment	240	78.45	4.32	8.15
Traditional lecture control group	240	65.87	5.21	9.02
Total	480	72.16	4.77	8.69

Interpretation

Students taught using innovative teaching methods had a higher mean retention score ($M = 78.45$) compared to those taught using traditional lecture methods ($M = 65.87$).

Mean Deviation: It shows the average deviation of each score from the mean within each group.

Innovative Teaching group: 4.32

Traditional lecture method: 5.21

The smaller mean deviation in the experimental group suggests that the scores were more consistently close to the group mean indicating uniform effectiveness of innovative methods.

Standard Deviation

In summary the descriptive statistics suggest that innovative teaching methods are not only more effective in improving retention but also produce more consistent results across students.

Table 4 Descriptive statistics of Post-test Retention scores by teaching method (Controlling for pre-test).

Teaching method	N	Adjusted Mean (Post-tests)	Mean deviation	Standard deviation
Innovative teaching method	240	79.12	4.18	7.95
Traditional lecture (Control group)	240	66.03	5.05	8.88
Total	480	72.58	4.62	8.41

Interpretation

Adjusted mean scores

After the controlling for pre-test scores, students taught using innovative teaching methods had an adjusted mean of 79.12 while those taught using traditional lecture methods had an adjusted mean of 66.03.

This shows that difference in post-test retention is not due to pre-existing knowledge but primarily due to the teaching method, showing the effectiveness of innovative teaching.

Mean Deviation

The mean deviation measures the average deviation of individual scores from the adjusted group mean

Experimental group: 4.18

Control group: 5.05

The smaller mean deviation in the innovative teaching group show that most students scored consistently close to group mean showing uniform effectiveness.

Standard Deviation

SD shows the spread of adjusted post-test scores.

Experimental group SD = 7.95

Control group SD = 8.88

The lower SD in the experimental group shows less variability in retention outcomes while the traditional group showed more scattered performance, which implies less consistent learning. In summary after controlling students prior knowledge, innovative teaching methods significantly improve retention and the combination of higher adjusted mean, lower mean deviation and lower standard deviation demonstrate that innovative methods are effective in boosting retention also produce more consistent learning outcomes across the students

Table 5: Analysis of Covariance (ANCOVA) of students Retention Scores by teaching method

Source	Type III Sum of Square	df	Mean square	f	Sig.(p)	Partial Eta Squared
Pretest	1,245.38	1	1,245.38	18.62	.000	.038
Teaching Method	3,872.41	1	3,872.41	57.94	.000	.109
Error	31,546.27	476	66.27			
Total	412,893.00	480				
Corrected Total	36,664.06	479				

Significance level: $P < 0.05$

The result of Analysis of Covariance (ANCOVA) revealed a significant effect of teaching methods on students' retention scores after controlling for pre-test differences $F(1, 476) = 57.94$, $P < .05$, partial $\eta^2 = .109$. This indicates that innovative teaching methods had a significant and substantial effect on students' retention compared with the traditional method. Null hypothesis rejected.

Ho2: Pre- test retention scores do not significantly influence post- test retention sores when teaching method is constant

ANCOVA results show that covariate (Pretest scores) has a significant effect on post-test retention, $F(1, 476) = 18.62$, $P < .05$, Partial $\eta^2 = .038$. Since $P < 0.05$, Ho 2 is rejected indicating that students' prior knowledge significantly contributes to post-test retention outcomes although the effect size is small to moderate (3.8% of variance explained).

Results

Results showed that students exposed to innovative teaching methods recorded significantly higher mean retention scores than those taught using traditional lecture methods. ANCOVA results indicated a statistically significant difference in retention between the two groups after controlling for pre-test score ($P < 0.05$).

Discussion

The findings demonstrate that innovative teaching methods significantly enhance students' retention in Secondary schools. These results support constructivist learning theory which emphasizes active engagement and meaningful learning. The result is in line with James (2022) that retention is influenced by various factors which includes interactive teaching methods, repetition and practice, relevance, cognitive engagement and spaced learning. It concludes by saying effective retention is a key indicator of successful learning and helps build a foundation for future academic or personal growth. The study also underscores the importance of instructional leadership in facilitating the adoption and effective implementation of innovative teaching methods.

Conclusion

The study concludes that innovative teaching methods significantly improve students' retention in Secondary schools in Kogi State. Learner centered instructional methods promote deeper understanding and sustained knowledge retention, which is important for academic success.

Implications for Educational Management and leadership

School leaders should prioritize professional development programmes focused on innovative pedagogy, strengthen instructional supervision and ensure the availability of instructional resources to support effective teaching and learning.

Recommendations

- School leaders should integrate instructional innovation into school plans.
- Teachers should be encouraged and trained to adopt innovative teaching methods

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Disclosure statement

The authors declares that there are no potential conflicts of interest regarding the research, authorship or publication of the article

Data availability statement

The data used or analyzed during the research period can be obtained from the first author.

Author contributions

Omuya Ohunene Florence Concept design and statistical analysis

Haruna Josephine Eleojo Administrative support

Tolorunleke Emmanuel Adebayo and Kachi Oluwatosin Motunrayo Technical support

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