



CHALLENGES IN BRAINSTORMING, ARTIFICIAL INTELLIGENCE, AND STUDENTS' EXAMINATION FAILURES: EVIDENCE FROM SELECTED HIGHER INSTITUTIONS IN NIGERIA

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Abstract: This study investigates the relationship between brainstorming challenges, the use of artificial intelligence (AI), and the increasing rate of students' examination failures in higher institutions in Nigeria. The study focuses on selected universities and colleges in the South-East zone. Data were collected using questionnaires and structured interviews from both students and lecturers. Results revealed that the absence of effective brainstorming sessions, dependence on AI-generated solutions, poor study habits, and inadequate digital literacy contribute significantly to examination failures. The study employed descriptive and inferential statistics using SPSS for data analysis. Findings showed a significant negative correlation between brainstorming ability and examination failure ($r = -0.52, p < 0.05$). The paper recommends that educational institutions integrate guided brainstorming exercises, ethical AI-use frameworks, and training programs to enhance students' cognitive development and performance.

Keywords: Brainstorming, Artificial Intelligence, Examination Failure, Higher Education, Nigeria

1. Introduction

In the modern learning environment, technological advancement has redefined how students acquire, process, and apply knowledge. Artificial Intelligence (AI) technologies—such as Chatbots, automated learning systems, and virtual tutors—have introduced efficiency and flexibility into education. However, these tools also present challenges, particularly when students use them unethically or as substitutes for independent thinking. Brainstorming, an essential learning process that enhances creativity, teamwork, and critical reasoning, appears to be diminishing among Nigerian students due to over-dependence on AI and other digital solutions. Consequently, this situation contributes to rising examination failure rates in tertiary institutions.

The problem of examination failure is not new in Nigeria's education system. What is new, however, is the emerging intersection between cognitive deficiencies (such as poor brainstorming skills) and digital-age misuse of AI. This study, therefore, explores how these two elements interact and affect academic outcomes, using selected higher institutions in Nigeria as a case study.

2. Statement of the Problem

In recent years, many higher institutions in Nigeria have recorded increasing rates of examination failures. Traditional explanations—such as poor teaching quality, inadequate facilities, and low motivation—only partially explain the trend. A closer look reveals two emerging issues: (1) limited brainstorming among students before examinations, and (2) over-reliance on AI for generating answers without full understanding. These practices weaken students' analytical and problem-solving skills, leading to poor performance. There is a lack of empirical studies examining the combined effect of brainstorming limitations and AI use on examination outcomes.

3. Objectives of the Study

The major objective is to examine how challenges in brainstorming and artificial intelligence usage contribute to students' examination failures in Nigerian higher institutions.

Specific objectives include:

1. To identify the level of brainstorming practices



among students.

2. To assess the extent of AI usage in academic preparation.
3. To examine the relationship between brainstorming and examination performance.
4. To determine the impact of AI use on students' performance.
5. To propose solutions to minimize examination failures.

4. Research Questions

1. What is the level of brainstorming engagement among students in higher institutions?
2. To what extent do students depend on artificial intelligence tools for academic activities?
3. How does brainstorming relate to examination performance?
4. What is the effect of AI use on students' performance?
5. What strategies can improve students' brainstorming and responsible AI use?

5. Review of Related Literature

5.1 Concept of Brainstorming

Brainstorming is a collaborative or individual technique for generating ideas and fostering creativity. According to Osborn (1953), brainstorming enhances critical thinking and problem-solving. In education, it helps students connect ideas before attempting tasks or exams. Studies in Nigeria (Eze & Okoro, 2022) confirm that effective brainstorming improves retention and performance.

5.2 Artificial Intelligence in Education

AI applications such as adaptive learning platforms, plagiarism checkers, and digital tutors can enhance learning. However, over-reliance on AI may reduce self-learning and analytical engagement (Oladipo et al., 2024).

5.3 Examination Failures in Nigeria

7. Data Presentation and Analysis

Variable	Mean	Std. Deviation	Interpretation
Brainstorming practice	2.74	0.82	Moderate
AI use for assignments	4.21	0.61	Very High
Examination performance	2.33	0.89	Low

Examination failure is a recurring challenge linked to weak preparation, poor reading culture, and inadequate teaching methods. The introduction of AI and online learning, though beneficial, may worsen failures if misapplied (Aremu & Udofia, 2023).

5.4 Theoretical Framework

This study is anchored on the Cognitive Load Theory and Technology Acceptance Model (TAM). The first explains that overloaded working memory leads to poor learning outcomes, while the second highlights users' attitudes towards technology. The intersection of these frameworks shows that without proper guidance, students' use of AI may impede their cognitive processes.

6. Methodology

6.1 Research Design

A descriptive survey design was adopted.

6.2 Population and Sample Size

The study covered 5 higher institutions in Nigeria's South-East zone, including 3 universities and 2 colleges of education. From an estimated 2,000 students, a sample of 300 was selected using stratified random sampling.

6.3 Instruments for Data Collection

Structured questionnaires and interview schedules were used. The questionnaire had three sections covering brainstorming, AI use, and academic performance.

6.4 Validity and Reliability

Experts validated the instrument; a pilot test yielded a Cronbach Alpha reliability coefficient of 0.84, confirming internal consistency.

6.5 Method of Data Analysis

Descriptive statistics (mean, SD) and inferential statistics (Pearson correlation, regression) were conducted using SPSS v25.



Ethical awareness of AI use	2.15	0.74	Poor
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Correlation Analysis:

There was a significant negative correlation between over-reliance on AI and exam performance ($r = -0.52$, $p < 0.05$). Brainstorming practice showed a positive correlation with exam performance ($r = 0.47$, $p < 0.05$).

Regression Summary:

indicates that 41 % of exam performance variance can be explained by brainstorming and AI-use variables combined.

8. Discussion of Findings

Results reveal that students rely heavily on AI tools such as GPTChat, Grammarly, and QuillBot, often bypassing brainstorming and comprehension. This dependence leads to surface learning, consistent with Cognitive Load Theory. The positive relationship between brainstorming and performance supports prior findings (Eze & Okoro, 2022) that active engagement enhances mastery. Lecturers interviewed emphasized that students who brainstorm and discuss before exams perform significantly better than those depending on automated outputs.

9. Conclusion

The study concludes that ineffective brainstorming and the misuse of artificial intelligence significantly contribute to examination failures in higher institutions in Nigeria. Integrating AI into education should not replace human reasoning but complement it. Academic institutions must balance technology use with cognitive skill development.

10. Recommendations

1. Incorporate structured brainstorming sessions into course delivery.
2. Develop ethical guidelines for AI use in academic work.
3. Provide training on AI literacy and critical thinking.
4. Use assessments that reward analytical reasoning over rote answers.
5. Encourage lecturer-student collaboration in research brainstorming.

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