

EFFECTS OF ADDIE AND TRADITIONAL CURRICULUM DESIGN MODELS ON ACADEMIC PERFORMANCE AND RETENTION OF SECONDARY SCHOOL HISTORY STUDENTS IN KATSINA STATE

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Abstract

This study investigated the effects of ADDIE and traditional curriculum design models on academic performance and retention of secondary school History students in Katsina state. The study was guided by two objectives: to ascertain the effects of ADDIE and traditional curriculum design models on academic performance of secondary school History students in Katsina state, and to find out the effects of ADDIE and traditional curriculum design models on retention of secondary school History students in Katsina state. Quasi-experimental research design was employed for the study. The population of the study comprised 3,572 senior secondary II History students. Sample of 124 intact classes was used for the study. History Performance Test (HPT) validated by experts in curriculum, history and test and measurement was used for data collection. The instrument yielded a reliability coefficient of 0.81. Mean and standard deviation was used to answer the research questions while, t-test for independent samples was used to test the hypotheses. Findings revealed that students taught History using ADDIE curriculum design performed significantly better than those taught using the traditional curriculum. It also revealed that students taught using ADDIE curriculum design retained experiences better than those taught using the traditional curriculum design ($p\text{-value } .000 < 0.05$). The study concluded that ADDIE curriculum design model enhances secondary school History students' academic performance and retention than the traditional curriculum design. The study recommended that curriculum experts and development agencies should ensure that ADDIE curriculum design model is adopted in the curriculum development process.

Keywords: ADDIE, Traditional Curriculum Design Models, Academic Performance, Retention, History.

Introduction

The 21st century curriculum design identifies critical thinking, creativity, communication, and collaboration as core learning outcomes, noting that history's emphasis on source evaluation and contextual analysis makes it an ideal means for such competencies. Thus curriculum content in all fields should be sufficient to enable students achieve the intended outcome and to progress safely to the next stage of learning or practice after graduation or successful completion of an educational programme. Curriculum design models are organised frameworks that direct the process of creating impactful and engaging teaching and learning experiences (Reiser & Dempsey, 2018). These models offer structured methodologies encompassing the analysis of learning needs, designing instructional

methodologies, the development of educational resources and learning materials, implementation of instruction processes and assessment and evaluation of its effectiveness.

One of the most foundational and widely recognized curriculum design models is ADDIE, an acronym for analysis, design, development, implementation, and evaluation. ADDIE is a generic, flexible model that forms the basis for many other curriculum design models. As stated by Branch and Dousay (2015), "the ADDIE model is often viewed as the fundamental building block of many instructional curriculum models, providing a flexible framework for developing instruction." The field of curriculum design adapts continuously, with novel models and modifications arising to meet the challenges posed by varied societal needs, learning contexts and innovative technological progress (Reiser & Dempsey, 2018). In the analysis phase, instructional designers identify the learning problem, target audience characteristics, learning objectives and available resources.

The ADDIE curriculum design model (analysis, design, development, implementation, and evaluation), a five phase process, represents the foundational framework of curriculum design in education. Developed by the U.S. Army in the 1970s at Florida State University, emerging from military needs of a structured framework that could guide training developers in producing high-quality instructional materials that met specific performance standards (Branch, 2021). ADDIE became the dominant framework in curriculum design literature and practice as scholars and practitioners embraced it as a generic universal model because of its clarity, adaptability and applicability across diverse learning environment. While often mischaracterized as rigidly linear, contemporary scholars emphasizes its cyclical, adaptable nature responsive to technological advancements and pedagogical innovations (Kumar & Ritzhaupt, 2021). This model's endurance stems from its capacity to integrate emerging educational theories while maintaining structural integrity. It provides a structured and iterative process for designing effective educational interventions that align with instructional goals, learner characteristics, content demands, and assessment metrics (Branch, 2020). Behaviourism is one of the earliest learning theories to influence curriculum design. Pioneered by scholars such as B.F. Skinner and John Watson, behaviourism emphasizes observable behaviour as the primary indicator of learning. According to this theory, learning occurs when there is a change in behaviour resulting from external stimuli and reinforcement. Curriculum design models influenced by behaviourism focus on stimulus-response associations, reinforcement schedules, and mastery learning (Ertmer & Newby, 2020).

The design phase involves creating a blueprint for the instruction, including learning strategies, assessment methods, and media selection. During development, the actual learning materials are created or assembled. The implementation phase involves delivering the instruction to the learners. Finally, evaluation assesses the effectiveness of the instruction, often through formative and summative assessments. On this premise, Janice (2024) revealed that ADDIE model provided a structured framework for designing, developing, and evaluating learning courses, leading to improved learning outcomes for students. While ADDIE is celebrated for its

systematic approach, critics sometimes point to its linear perception, arguing that real-world instructional design is often iterative. However, advocates emphasize its inherent flexibility and iterative nature when applied correctly (Peterson, 2019). Recent applications of ADDIE often involve its integration with agile methodologies to enhance its adaptability in dynamic educational contexts (Al-Hoorie, 2021). Curriculum design models provide invaluable frameworks for systematically creating effective learning experiences (Zahida, Zaryab & Syeda, 2024).

The ADDIE model offers a systematic approach to curriculum design, ensuring that educational programs are thoughtfully planned, executed, and assessed. In the analysis phase, educators identify learners' needs, existing knowledge, and learning objectives. The design phase involves outlining the instructional strategies and selecting appropriate assessment tools. During development, instructional materials are created based on the design specifications. Implementation entails the actual delivery of the instructional content, while evaluation focuses on assessing the effectiveness of the instruction and making necessary revisions. Alnajdi (2018) argued that the use of ADDIE curriculum design model impact the academic achievement of student. This iterative process ensures that the curriculum remains responsive to learners' needs and promotes continuous improvement (Boateng, Kalonge & Duedu, 2024). In the context of history as a subject, the application of the ADDIE curriculum design model has significant potential. The integration of evaluation within the ADDIE model plays a fundamental role in fostering higher-order cognitive and problem solving skills. By embedding formative and summative assessments throughout the curriculum process, educators can provide timely feedback, encourage individualised learning, and promote metacognitive strategies among learners (Fajrin, Prasetyo & Susiana, 2023). This continuous assessment approach aligns with the development of critical thinking and problem-solving abilities essential for historical inquiry. The application of the ADDIE model aligns with the goals of 21st-century education, which emphasizes the development of skills such as critical thinking, collaboration, and digital literacy. Blended learning models based on the ADDIE framework have been shown to improve students' academic attainment and their acquisition of 21st century skills (Şentürk, 2020).

Similarly, History in the secondary school context is framed around knowledge acquisition, skills development, value orientation, and civic responsibility (Adegbile & Adedigba, 2021). Contemporary findings highlight the decline of history in the face of an innovative and technological driven changing world which invariable has impacts on educational goals and outcomes. History curriculum content and its implementation should transcend mere content delivery to develop learners' critical thinking, problem-solving, and metacognitive capacity skills deemed essential for global citizenship and competitive readiness in the 21st century. Avramenko, Protas, Gapon and Symonchuk (2024) on digital tools in history education strongly supports UNESCO (2023) call for inquiry-based and technology-enhanced history curricula, arguing that digitally mediated tasks like virtual archives, geographic

information system mapping (GIS), augmented reality (AR) and virtual reality (VR) foster deeper disciplinary understanding and prepare secondary school students for complex societal challenges, brainstorming ideal solutions with reference to past occurrence and incorporating digital process to knowledge history. Empirical research reveals that when history instruction integrates creative thinking, problem-based learning, digital and multimedia resources, students demonstrate significant gains in higher-order thinking skills if accessed using analysis, synthesis and evaluation narrative synthesis (Wilson & O'Connor 2023). However, curriculum cannot be effectively implemented without the utilization of appropriate and result-oriented curriculum design models tailored to meet the needs of the learners, school and society.

History curriculum draws on significant events of the past to inform the present while safeguarding the future. Similarly, History does not only study the past in isolation from the present but relates intricately with the success, achievements and failures of antecedent generations to the contemporary case and sets the stage for a better living in the morrow (Boadu, 2016). The study of history does not only broaden students' knowledge and appreciations of the world, but offers the basis of constructive interaction and objectivity in analyzing issues. History curriculum aims at helping students to understand the present existing social, political, religious and economic conditions of the people. By significance, history is to tell a story about the past which captures the essence of an event. Similarly, Animba (2019), stressed on the fact that history helps one to master and understand the past because that is the key to understanding the present. In striving to achieve these goals, history curriculum employs a multi-disciplinary approach that takes cognizance of the socioeconomic, political, religious, physical, scientific and technological aspects of life (Mosha & Dida, 2022). History in the secondary school context is framed around knowledge acquisition, skills development, value orientation, and civic responsibility (Adegbile & Adedigba, 2021). History is taught to develop students' awareness of their cultural heritage, identity, and the broader human experience. It offers insight into national development, inter-group relations, conflicts and their resolutions, governance, and global interactions. Retention in this study is the ability to remember task, or material concepts.

Retention is the repeat of performance of a task of learnt behaviour earlier acquired. It is the preservative factor of the mind (Gana, 2013). It is the ability to retain and recall information or knowledge gained after learning. Sokoto and Binji (2024) showed that the use of ADDIE curriculum design proved to be better than traditional model. This study is related to the present study as it investigates the effect of ADDIE curriculum design on academic performance but differ with retention. Factors effecting retention include the content or tasks to be performed, learners past experiences, the interval between lesson and evaluation and instructional strategies employed.

Statement of the Problem

The performance of students in History has over the years been unsatisfactory. External examination bodies such as West African Examination Council (WAEC) has repeatedly

reported poor performance in History. The report of the chief examiner, West African Examination Council 2019 – 2023 revealed that candidates' performances were poor. The report further stated that History recorded instability in number of students who chose to offer the subject and partake in the examination as requirement for higher education. According to WAEC (2024) Chief examiner's report, general poor performance of History students can be indicative of poor and perhaps, declining quality of education at the secondary level which can be caused by inappropriate history curriculum design. This is evident from the results of the senior secondary school certificate examination for History in Katsina state. This study on this premise seeks to research on effects of the ADDIE curriculum design model on academic performance and retention of secondary school II history students. By addressing this research gap, the study aims to provide insights into the effectiveness of ADDIE curriculum design models in the process of teaching and learning history.

Objectives of the Study

The study was guided by the following objective:

1. ascertain the effects of ADDIE and traditional curriculum design models on academic performance of secondary school history students in Katsina state.
2. find out the effects of ADDIE and traditional curriculum design models on retention of secondary school history students in Katsina state.

Research Questions

The study answered the following research question:

1. What is the effects of ADDIE and traditional curriculum design models on academic performance of secondary school history students in Katsina state?
2. What is the effects of ADDIE and traditional curriculum design models on retention of secondary school history students in Katsina metropolis?

Hypotheses

The following hypotheses was formulated and tested at level 0.05 level of significance:

- HO₁.** There is no significant difference in the academic performance of secondary school history students when taught using ADDIE curriculum design model and those taught using traditional curriculum design model in Katsina state.
- HO₂.** There is no significant difference in the retention of secondary school history students when taught using ADDIE curriculum design model and those taught using traditional curriculum design model in Katsina state.

Methodology

The study employed quasi-experimental research design. This design was adopted because it was not possible to have complete randomization of the subjects to avoid the disruption of school organization (Gallin, Ognibene & Johnson, 2018, Gray 2023). Consequently, intact classes were randomly assigned to experimental group and control group. The experimental group was taught using ADDIE curriculum design while, the control group was taught using the traditional curriculum design. The population of the study comprised 3,572 senior

secondary school students. A sample size of 124 was randomly selected. History performance test (HPT) was used as instrument for data collection. These questions were adapted from past West African Examination Council (WAEC). Each question was made up of four options A – D. A table of specification developed by the researcher guided the construction of this instrument, while the objectives as specified in the National Curriculum for History using ADDIE model and Traditional model guided the construction of questions. Pilot test was conducted to determine the instruments reliability and usability. The statistical tool used for the internal consistency was the Kuder-Richardson formula - 20 (KR - 20). A reliability coefficient of 0.81 was obtained. Mean, Standard Deviation and t-test was used to analyze the data. Mean and Standard deviation score was used to answer the research questions, while independent sample t-test was used to test the hypotheses at 0.05 level of significance.

Results

Research question one: What is the effects of ADDIE and traditional curriculum design models on academic performance of secondary school history students in Katsina state?

Table 1: Performance mean and standard deviation for experimental and control groups

	Groups	N	Mean	Std. Deviation	Mean Difference
Posttest	Experimental group (ADDIE)	32	27.781	2.6608	6.8949
	Control group (Traditional)	44	20.886	2.2122	

Table 1 showed the posttest performance of students taught History using ADDIE and Traditional curriculum design models in Katsina State. The mean scores showed that students taught History using ADDIE curriculum design model performed better with mean score of 27.78 which exceeded the performance of students taught using traditional curriculum design model with mean score of 20.88 with corresponding standard deviation of 2.66 and 2.21 respectively which yielded a mean difference of 6.89. This implies that students' posttest performance using ADDIE was higher than those students taught using traditional curriculum design model which could be attributed to the treatment after pre-test. To find if mean differences was significant, the mean scores were subjected to t-test statistical analysis.

Research question two: What is the effects of ADDIE and traditional curriculum design models on retention of secondary school history students in Katsina metropolis?

Table 2: Retention mean and standard deviation for experimental and control groups

	Groups	N	Mean	Std. Deviation	Mean Difference
Delayed Posttest	Experimental group (ADDIE)	32	30.094	2.1755	9.73
	Control group (Traditional)	44	20.364	1.7926	

Results in table 2 indicates that students taught History using ADDIE curriculum design model had a retention mean score of 30.09, while students taught using traditional curriculum design model had a retention mean score of 20.36 with corresponding standard deviation of 2.17 and 1.79 respectively. This implies that students taught using ADDIE curriculum design model had a higher delayed posttest performance mean score with a mean difference of 9.73 over those

taught using traditional curriculum design model. To find if retention mean differences was significant, the mean scores were subjected to t-test statistical analysis.

Hypotheses

HO₁: There is no significant difference in the academic performance of secondary school history students when taught using ADDIE curriculum design model and those taught using traditional design model in Katsina state.

Table 3: T-test analysis of experimental and control groups on performance

Group	N	Mean	Std.D	M.D	df	t- cal	P-value	Outcome
Experimental	32	27.78	2.66					
				6.89	74	12.31	.000	Significant
Control	44	20.88	2.21					

$\alpha \leq 0.05$

Table 3 reveals that there is significant difference between the mean performance scores of senior secondary students taught History using ADDIE curriculum design model and those taught using traditional curriculum design model. This was because the P-value .000 is less than 0.05 alpha level of significance and df at 74. It was found that ADDIE curriculum design model enhanced student's performance better than the traditional curriculum design model. Therefore, the null hypothesis which states that, there is no significant difference between the mean performance scores of senior secondary students taught History using ADDIE curriculum design model and those taught using traditional design model, was rejected.

HO₂: There is no significant difference in the retention of secondary school history students when taught using ADDIE curriculum design model and those taught using traditional curriculum design model in Katsina state.

Table 4: T-test analysis of experimental and control groups on retention

Group	N	Mean	Std.D	M.D	df	t- cal	P-value	Outcome
Experimental	32	30.09	2.17					
				9.73	74	21.34	.000	Significant
Control	44	20.36	1.79					

$\alpha \leq 0.05$

Table 4 reveals that there is significant difference between the mean retention scores of senior secondary students taught History using ADDIE curriculum design model and those taught using traditional curriculum design model. This was because the P-value .000 is less than 0.05 alpha level of significance and df at 74. It was found that students taught using ADDIE curriculum design model retained experiences better than those taught using traditional curriculum design model. Therefore, the null hypothesis which states that, there is no

significant difference between the mean retention scores of senior secondary students taught History using ADDIE curriculum design model and those taught using traditional design model, was rejected.

Discussion of Findings

The findings of the study revealed that there is significant difference between ADDIE curriculum design model and traditional curriculum design model on academic performance of History students in Katsina state. The difference is in favour of the ADDIE model. This is in conformity with the findings of Janice (2024), which revealed that ADDIE model provided a structured framework for designing, developing, and evaluating machine learning courses, leading to improved learning outcomes for students. Likewise, Zahida, Zaryab and Syeda (2024), Yaki, Midat and Bawa (2020) revealed students of experimental group performed better than control group in the post-test, demonstrating that ADDIE curriculum design model is effective for instruction and can produce better results.

The findings of this study also agrees with Sokoto and Binji (2024) on effects of ADDIE curriculum design on academic performance of geometric concepts among upper basic students in Sokoto state which indicated that the use of ADDIE curriculum design proved to be better than traditional model. In relation hypothesis two, Yan, Zheng, and Ye (2025) established that IVR-ADDIE digital storytelling teaching mode positively impacted students' learning achievement, self-regulation ability, and self-efficacy.

Conclusion

Based on the findings of this study, it was concluded that ADDIE curriculum design model is effective on history students' academic performance and retention than the traditional curriculum design.

Recommendations

The following recommendations were made:

1. Curriculum developers such as NERDC and curriculum experts should ensure that ADDIE curriculum design model is adopted in the curriculum design and development process and implementation. This will serve as a guide towards developing a quality goal oriented curriculum.
2. Curriculum experts' validation reports should be properly followed towards developing a standard ADDIE curriculum design model.

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