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THE EFFECTS OF DIGITAL PEDAGOGIES ON STUDENTS' PERFORMANCE IN CURRICULUM & INSTRUCTION II IN FACULTY OF EDUCATION, ABIA STATE UNIVERSITY, UTURU

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Abstract

The paper investigated the effects of Digital pedagogy on students' performance in Curriculum & Instruction II in faculty of Education, Abia State University. The population comprised of 91 three hundred level students which was divided into two groups of experimental and control. The researcher adopted pretest and posttest quasi experimental design where experimental group were taught using digital pedagogy approach and the control group were taught using conventional method and the work posed and formulated 2 research questions and 2 null hypotheses. Research questions were answered using mean and standard deviations, while hypotheses were tested using independent sample t-test at 0.05 level of significance. The result yielded a positive support of using digital pedagogy teaching approach with mean achievement score of 15.25 and in favour of conventional teaching approach with gained mean achievement score of 9.40. The work concluded that digital pedagogy teaching approach should be adopted and utilized for its educational benefits shown in greater students' performance. Recommendations were made which include, among others, sustainability of usage, regular workshops and training of staff to enhance their digital skills and functionality with a view of bridging the digital divide among these educational operators and the learners.

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Introduction

In contemporary world, mostly in 21st century educational practices, the adoption of technology in education matters has gained a wide momentum underscoring its use in varying dimensions ranging from administration, communication, curriculum design and implementation. Educational-driven innovation is the act of creating and disseminating new educational practical tools and practices, mode of curriculum delivery and assessment of learning outcomes. Adoption of digital-based pedagogies and effectively used, tends to improve the quality and productivity of educational service delivery. Experts often describe the educational sector as suffering from lack of innovation and structural inability to improve instructional technologies and practical know-how about digital based pedagogical instructional tools. It is a serious concern that most educators do not believe on the necessity of having a developmental theory of how students learn content and how pedagogies relate to knowledge development as it relates to content. Teachers are primarily artisans working alone in a personal designed environment where they developing most skills by trail-ad-error tinkering and searching pragmatically for acceptable solutions to learners problems (OECD 2024). Digital pedagogies align to the teaching approaches that incorporate supportive digital technologies to enhance learning experiences, leveraging on digital platforms and resources to enhance students' engagement, personalised learning, increase accessibility, foster collaboration and digital literacy development of both learners and educational operators. Effects delineate the impact, influence or emotional reasonance that words or occurances have on individuals, groups or situations in a given phenomenon. Teaching encompasses the complex and multi-dimensional process involving guiding, facilitating and supporting learners' acquisition of knowledge, skills and values to function effectively in both immediate and larger societies. Ogbonna (2024), resonated that digital pedagogies refer to every technology based medium used by lecturers to convey information, facts, knowledge and skills to a group, individuals or targeted audience, it can be in a conventional classroom, virtually or online platforms. Eze (2023) and Ikem (2023) opined that digital based pedagogies reshape while promoting innovation in mode of curriculum delivery and implementation. This does not underscore Mezieobi and Mezieobi (2020) who asserted that digital pedagogies focus on student-centred teaching and learning methods that fosters the development of collaboration and critical thinking among the learners. In furtherance, digital pedagogies place more emphasis on integrating digital tools and content to create engaging, flexible and interactive learning environments that fosters students' agency providing real-time feedback evaluation and assessments. Oku and Anyaogu (2022) Mezieobi (2021) added student agent as important aspect of digital based pedagogies that emphasize students centrism while lecturers'

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agent offering opportunities to learners to explore teaching and makes it more interesting. According to them digital base pedagogies is referred to as a thoughtful and critical utilization of digital resources ad methodologies to improve enhance teaching and improve performance outcomes. Furthermore, it advances beyond using technology to critically examining when and why aligning it with learning objectives and goals to create more engaging collaborative and inclusive personalised educational experience. It is believed that 21st century lecturers are beginning to use digital tools for blended teaching and learning (BTL). The use of digital pedagogies in teaching ad determining the student's performance in curriculum and instruction II (Edu 321) in Abia State University is uncertain. There are arrays of digital resources or platforms which include Zoom, Google classroom, WhatsApp lecturers can use to enrich learning, clarifying abstract concepts, but however what seems to be a mirage is the effects of digital pedagogies in teaching and students' performance outcomes in Edu 321 in faculty of education Abia state university Uturu Nigeria. The study therefore is set out to determine the effects of digital pedagogies in teaching ad performance of students in curriculum and instruction II (Edu 321) in faculty of education, Abia state university Uturu.

Objectives of the Study:

The study is predicted on the followings:

- To determine the effects of use of digital pedagogies in teaching and performance of students in faculty of education Abia state university.
- To ascertain if gender difference exists in the score of students taught using digital pedagogies.

Research Questions:

The following research questions were formulated to guide the study:

- What is the difference in academic achievement scores of students taught Edu 321 using digital pedagogies and those taught with conventional instructional strategy in the physical classroom.
- Is there any gender difference in students' academic achievement score of students taught using digital pedagogies.

Research Hypothesis:

The following hypotheses were developed to guide the work.

- There is no significant difference in the academic achievement score of students taught using digital pedagogies and conventional instructional teaching strategy in physical classroom.

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- There is no significance difference in academic achievement score of male and female students taught using digital base pedagogy.

Theoretical Framework

The theory that supports this work is the Constructivism theory of Piaget developed around 1920 – 1930. This theory met pedagogical digital goals whereby students determine how to learn and when to learn. It also lent its support on students-centered teaching, aligning its self with how technology shift classroom from transmission of knowledge to knowledge construction mediated by technology while emphasizing learners' agency, collaboration bridging learners digital divide. Constructivist practices like learning, student-centred learning, peer learning, personalised learning and foster knowledge sharing and build up community learning networks.

Concept Explication

Digital pedagogy is referred to be the international design of instruction with digital tools geared towards transforming not just digitize instruction but emphasizes learners' agency collaboration. It lays emphasis on knowledge construction mediated by technology. Digital pedagogy according to Ahmed, M. M. (2021) enhanced instructional outcomes positively, and further opined that digital pedagogy requires re-designing task, not just adding technology. Effective digital pedagogy occurs at intersection of technological pedagogical and content knowledge. Adopting digital-based pedagogies tends to improve the quality and productivity of education technological-driven matters. Digital pedagogies have irresistible power to drive human activities socially, economically, as well as invention and advancement to tend to sustainable educational development in instructional delivery in tertiary institutions globally. (Olubamise, Ahmed, Akingbade, Funke and Ogundana (2024).

Technological Infrastructure

The effective integration of technological instructional devices or tools in Nigerian instructional process is largely dependent on the robustness and accessibility of the country's educational supportive technological infrastructure is the cornerstone of leveraging on electronic tools or media for instructional practices. According to Chinekwu, A. Ugbor, Emmanuel T. Makinde and Samuel O. Owoeye (2024) investing in high-performance technology ensuring dependable network access setting up effective data management. They further opined that inclusion of smart internet-enabled devices, utilization of digital devices, Cloud Computing, Continuous IT Support and a focus on energy efficiency further enhance the utilization of educative, supportive of technological

instructional infrastructure allowing teachers to fully leverage and improve education service delivery.

Piaget which was developed around 1920s – 1930 which met pedagogical digital goals whereby students determine how to learn, the theory supports student that teaching should be student-centered and aligns with how technology shifts classroom from transmission of knowledge to knowledge construction mediated by technology while emphasizing learners agency, collaboration, bridging learners digital divide.

Benefits of Digital Pedagogy

Though access barriers, low digital literacy can limit benefits. Alexandrowicz, V. (2024) argued that one-size fits-all technological training does not work, but success depends on pre-existing ICT competence but digital divide distractions and self-discipline issues can also hinder effectiveness. Nevertheless the following benefits were outlined by various authors as:

- Increased student engagement and motivation {Rayhan, A}
- Personalised and flexibility learning development of transversal skills and virtues {Richard F. Mayer et al (2009)}
- Enhanced pervasive and universal learning {Macazana Fermadez, D. et al (2025)}
- Supports formative assessment and dialogic instruction - Beatty, I. D. & Gerace, W. J. (2009)
- Builds digital literacy and participatory culture - Bernard et al (2014)
- Improved students satisfaction {Bernard et al (2014)}
- Promotes critical thinking and active learning – {QAA - Publications Quality Assurance Agency for Higher Education, UK (2021)}

Methods

The study utilized pretest-post test control group quasi-experimental design. The design comprised of two groups, the experimental and control groups. The experimental group was taught using digital based pedagogy (DBP) by creating electronic platforms e.g. Zoom and WhatsApp. The teaching on curriculum and instruction content lasted for three (3) months alongside teaching using conventional instructional approach. The population consists of entire three hundred (300) level students. The experimental group consists of forty-eight (48) students (n=48, 25 males ad 23 females) were taught topics in curriculum and instruction II using digital-based pedagogies (DBP) while another intact class constituting the control group (n=43 all were males) were taught the same topics using conventional instructional approach in the physical classroom. Inspite the gender imbalance existing between the experimental and control groups, the pretest results

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showed the performance of the two groups is approximately the same and therefore have no potential effect on the results of their posttest.

The instrument used for data collection was curriculum and instruction II test scores (C&I$^2TS). The (C&I^2TS) items were constructed based on course content. The items consist of two (2) sections (A&B). Section A sought for students' personal information on gender. And section "B" sought for response on the students' achievement in the curriculum content taught. Section "B" was made of thirty (30) multiple-choice items with options ranging from A-D from which the students were expected to choose the correct respond. Each correct respond was scored two (2) marks and incorrect respond was scored zero (0). The (C&I^2$T) items along with its marking scheme were validated by two (2) professors one from curriculum and Teacher Education and the other from Educational technology departments of Faculty of education of the university. Test and retest method of administration was used and reliability index was established at 0.82 using Pearson product Moment Correlation Coefficient. Both the experimental and the control groups were pre-tested to establish a level of performance to ascertain equivalency. The treatment/teaching for both groups lasted for three (3) months, thereafter, a post-test was administered to both groups to ascertain the level of performance. Data collected from both groups were analyzed using descriptive statistics of mean and standard deviation and inferential statistics of independent sample T-test after meeting all assumption (normality, homogeneity of variance etc). The research questions were answered using mean and standard deviation while independent sample T-test was used to test the null hypotheses at 0.05 level of significance using SPSS software.

Results

Mean and standard deviation were used to analyze the pre-test ad posttest scores of the two groups.

Research Question One (1)

What is the difference in academic achievement scores of students taught EDU371 using digital-base pedagogies and those taught with conventional instructional strategy in the physical classroom.

Table 1

Pretest and Posttest Mean Achievement Scores on Curriculum & Instruction II (Edu 321) using Conventional Instructional Strategy in the physical classroom (CIS) and taught using digital-base-pedagogy (DBP)

Group	N	Pretest X	SD	Posttest X	SD	Gained Mean
DBP	48	13.13	3.85	28.38	6.36	15.25
CIS	43	12.88	4.71	22.28	3.67	9.40
Mean Diff	0.25 |		6.10		5.85	

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Table 1 above reveals that students taught using DBP have pretest mean achievement score of 13.13 and posttest mean achievement score 28.38 with gained mean achievement score of 15.25 while those in CIS in physical classroom have pretest mean achievement score of 12.88 and posttest mean achievement score of 22.28 with gained mean score of 9.40. The students in experimental group have higher posttest mean achievement score than those in control group (CIS). The difference between the gained mean of two groups is 5.85 in favour of those who were taught using DBP.

Research question two (2)

Is there any gender difference in students' academic achievement scores on Curriculum & Instruction II (Edu 321) of students taught using digital base pedagogy?

Table Two (2)

Post-Test Mean Achievement scores of Male and female students on Curriculum and Instruction II (Edu 321) taught using digital base pedagogy (DBP)

Group	N	X	SD	Mean Difference
Male	25	27.60	6.22	—
Female	23	29.22	6.54	0.38
DF → 0.05				

Table two (2) above revealed that the mean achievement scores of male students taught using digital base pedagogy (DBP) was 27.60 with standard deviation of 6.22 while those of the female students was 29.22 with standard deviation of 6.54. The mean difference between male and female students have slightly high mean achievement scores than their male counterparts who were taught using DBP.

Hypotheses Testing: The null hypotheses formulated were tested at 0.05 levels of significance using SPSS software.

HO_1: There is no significant difference in the academic achievement score of students taught using digital-base pedagogy and conventional instructional teaching strategy in physical classroom.

Table Three (3)

Independent Sample T-test Analyses for Post Mean Achievement Scores of the Experimental and Control Groups
(Edu 321) taught using digital base pedagogy (DBP)

Group	N	X	SD	DF	t-cal	P-value	Remarks
DBP	48	28.38	6.36			0.000	
CIS	43	22.28	3.67	89	4.80		Significance

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Table three (3) above shows the analysis of independent Sample t-test for posttest academic achievement scores of the experimental and control groups. The observed p-value was 0.000 with 89 as degree of freedom. The observed p-value is less than the level of significance (0.05) is hereby rejected, hence there is significant difference in the academic achievement of Edu 321 students taught using digital-base pedagogy and those taught in physical classroom using conventional instructional strategy in favour of the experimental group. (t-cal = 4.80, df = 89, p-value = 0.000 < 0.05)

This showed that experimental group who were taught using digital-base pedagogies (DBP) outperformed the control group who were taught in the physical class using conventional instructional strategy (CIS).

HO_2: There is no significant difference in the academic achievement score of male and female students taught using digital base pedagogy.

Table Four (4)

Independent Sample T-test Analysis of posttest Mean achievement scores of male and female students taught Edu 321 using digital-base-pedagogy

Group	N	X	SD	DF	t-cal	P-value	Remarks
Male	25	27.60	6.37				
Female	23	29.22	6.54	46	0.878	0.385	Not Signif.
P → 0.05							

From the above table, it was observed that P-value was found to be 0.385 with 46 as degree of freedom. The observed p-value (0.385) is greater than significant level of (0.05). The null hypothesis two (2) which sought to establish if there is a significant difference in the academic achievement mean score of male and female students taught using digital base pedagogy is hereby accepted based on the observed p-value of (0.385) which is greater than the significant level of (0.05). This shows existence of significant difference in the academic achievement score of both male and female students taught Edu 321 using digital base pedagogy [0.878, df = 46, p-value 0.385 > 0.05]. The p-value showed no significant difference because the male and female students were given equal learning opportunity in terms of accessibility, information processing, personalized learning and undistracted learning environments that greatly rekindled their interests while learning through digital based teaching approach. Students participating actively and individual learning differences were adequately taken care.

Discussion

Based on the findings the study revealed that students of Edu 321 taught using digital-based pedagogy have higher mean achievement score than those taught in the physical

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classroom using conventional instructional strategy. This implying that the use of technological base-instructional approaches enhances and improve teaching which became evident in students learning outcome in favour of those taught using digital base pedagogy as shown in higher mean academic achievement scores. This finding is interderm with Eke, C.O (2023), Nuru Kem, K. (2023), Mezieobi (2019), Nuru, I.O and Obi D.R (2023), Obama P.N (2023) Oku O.O and Anyaogu R.O (2022) Okele F.N. (2020) Onwuka I (2019) all agreed that digital base instructional strategy or pedagogy (DBP) enhanced teaching and improved academic achievement gain, whereas none of these researchers talked about gender. Thus the study established a significant difference in the academic achievement of male and female students taught Edu 321 using DBP with t-cal of 0.828 ad 46 degree of freedom while DBP enhanced teaching and improved academic achievement gain, this outcome could be however be attributed to the accruing benefits of learning principles of making learners active participant involving and evoking learners interest through digital learning platforms accessing learning irrespective of locations. The findings align with Ogbonna and Nwaze (2025) who found out positive effect of technological instructional device for effectual curriculum delivery in South East Nigerian universities.

CONCLUSION

The researcher from the results and discussions on the topic concluded that digital base pedagogy is highly effective and should be adequately utilized as a teaching approach for greater attainment of learning outcomes, increased students' performance for overall development of learners. The use of digital pedagogy should be sustained with a view of bridging digital-divide gap among the educational operators and educants.

RECOMMENDATIONS

From the foregoing findings of the study, the following practical recommendations are made to:

1. Adopt and enhance the effective use of digital pedagogical approach in teaching by lecturers to promote students engagement and interactive learning for greater academic achievement gains.
2. Institutions should provide and maintain adequate digital infrastructure e.g. dependable internet connectivity, computers and projectors to support effective digital teaching and learning.
3. Regular workshops, capacity-building programmes should be organized for lecturers to increase their digital skills and functionality and enforce the usage of

the infrastructures in education matters of home institutions as its adoption and utilization should be sustained for its known educational benefits.

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