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Utilizing the Power of Artificial Intelligence for Personalized Learning of Business Education Graduates Students in Rivers State Universities

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ABSTRACT

The study examined the extent to which Business Education Graduate students Utilize Artificial Intelligence for Personalized Learning in Rivers State Universities. Two (2) specific objectives, research questions and null hypotheses respectively were posted and formulated for the study. Descriptive survey design was adopted for the study and the population comprises of 225 Business Education Graduate students from two academic sessions 2022/2023, 2023/2024 from Rivers State Universities. Out of the 225 Business Education Graduate students, 92 were from Rivers State University and 133 from Ignatius Ajuru University of Education. The population was manageable hence there was no sampling techniques. The Instrument for data collection was a self-structured questionnaire titled: "Utilizing the Power of Artificial Intelligence for Personalized Learning of Business Education Graduate students in Rivers State Universities Questionnaire (UPAIPBEGSQ)". The Instrument was validated by three (3) experts in Faculty of Education; two Business Educators and one Measurement and Evaluation expert. Reliability of the Instrument was measured by test-retest method using Spearman Rank High Order Correlation Coefficient (ROC) which resulted to a reliability index of 0.87. The Questionnaire was administered through Google fronts and out of 225 Business Education Graduate students in Rivers State Universities only 220 students responded to the questionnaire and it was used for data analysis. The Instrument was structured on a 4 point rating scale of Very High Extent, High Extent, Moderate Extent, and Low Extent. Research questions were answered using mean and standard deviation while t-test was used to test the null hypotheses at 0.05 level of significance. The findings from the study revealed moderate to high Utilization of Artificial Intelligence for Personalized Learning, particularly in area of academic support and adaptability to individual learning needs, while more advanced features like stimulating curiosity were less frequently used. However, the researcher recommended that; Universities management should strengthen digital infrastructure, implement continuous training programs and promote active students engagement with Artificial Intelligence technologies such as (Adaptive Learning Platform and, Machine Learning) to fully realize the potential of personalized learning.

Keywords: Artificial intelligence, Adaptive Learning, Machine learning, Personalized learning Business Education

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INTRODUCTION

Artificial Intelligence (AI) is transforming our world and education is no exception. AI has the potential to revolutionize teaching and learning, offering new ways to enhance personalized learning, improve assessment, and reduce planning time for teachers. In recent years, there has been growing interest in using Al to enhance personalized learning in Education. Al-based tools can analyze students' data and tailored learning experiences to individual needs, offering a more customized approach to Education. This can potentially improve learning outcomes and student engagement and reduce dropout rates.

Artificial intelligence refers to the study of intelligent machines and software that can reason, learn, gather knowledge, communicate, manipulate and perceive object (Ubulom, Wogboroma, & Samson, (2024). Strusani and Houngbonon (2019) defined Al as a combined large volume of data with computing power to stimulate human intellectual abilities such as reasoning, language processing, perception, vision recognition and spatial processing. Al has penetrated Education sphere, in the form of intelligent books, web browser, education apps and learning platforms (Karesenti, 2019). Al has enabled new ways of learning, teaching, assessment and research, thus, increasing the efficiency of educational activities and give access to wide range of information.

Artificial intelligence is the ability and advancement of data innovation-based personal computer (PC) framework or other machines to do tasks that normally need human understanding and rational thought (James-Ngochindo & Kayii, 2025). Al is effective in improving the quality of Business Education programme by facilitating improved communication skills for learners and enhances their connection to the global community, advancing Business Education curricular, enhancing individualized learning and creation of e-learning system, handling organized and unstructured data, which in turn reduces management burden and accelerate decision making process (Slimi, 2021).

The increased role of artificial intelligence has forced modern generation of students to acquire knowledge and skills much faster. Al in Education opens up new opportunities in Education practice. In its short history, Artificial intelligence in Education has undergone several periods, which are characterized by three paradigms, in which Al method are used in different ways to solve Education and learning problems. In the first paradigm, Artificial Intelligence in Education are tools used to represent knowledge model and direct cognitive learning in which learners are recipients of educational services. In the second paradigm, Artificial Intelligence in Education is tool used to support learning while students work alongside Al. In the third paradigm, Artificial Intelligence tools are used to enhance learning opportunities while students participate in learning. In general, the development trend of Artificial Intelligence in Education has evolved to empower the learners and personalized learning process, allowing learners to reflect on learning and inform Al system to adapt accordingly, and lead to the iterative development of personalized Learning, learner-centered, and data-driven learning (Ouyang & Jiao, 2021).

Personalized learning is not something new in the field of Education, but with the advent of Artificial Intelligence and big data analytics, new ways of implementing them are opening up (Magomadou, 2020). The digital learning environment offers the potential for personalized learning pathways. Learning is a natural human ability that starts in personal experience, cognitive awareness, personal biases, opinions, cultural background and environment. Learning is an individualized experience that expands knowledge, mined perspective and practical skill (Shemshack & Spector, 2020). A significant disadvantage of traditional teaching is that all students have to follow the same learning sequences, but not all of them

have the same knowledge, preferences, learning goals and needs. Traditional learning resources encourage learners to follow a set of learning sequences to improve their academic performance. Fixed learning pathways are not appropriate for all students. The designers of modern Education courses pay special attention to the development of personalized learning pathways taking into account the needs, motivation, behavior, patterns, abilities, interest, preferences, strength and weaknesses of each student (Elshani & Nuci, 2021).

Personalized Learning is a systematic learning design that adapts learning to the personal strength, preferences, needs and goals of an individual learner. It leads to a comprehensive learning experience by ensuring that a wide choice of new discipline and skill development of students or learners (Walkington and Bernack, 2020). Personalized learning assigns a specific role to teachers which gives students the opportunities to manage their learning process, to be responsible for setting and implementing educational goals that corresponds to his personal interest and needs (Aberbach, Jeghal, Sabri, Tairi & Laavoina, 2021). Personalized learning systems and approaches motivate student to learn and improve their academic performance (Zlatarov, Ivanova, & Doncheva, 2021). Personalized learning emphasizes the importance of personal growth and learning environment. A personalized learning environment includes a variety of services, learning tools and application tailored to the individual student's needs.

The use of artificial intelligence offers student of different age groups, academic level and socioeconomic background, the opportunities to enhance learning experiences and improve academic achievement. Artificial intelligence technologies play a pivotal role in the development of personalized learning. Al allows use of different teaching methods effective for each student, taking into the student strengths, weakness, talents and academic problem of each learner. Advanced analytics and machine learning present a potential for developing social and emotional learning skills. New technologies enable educator to develop personalized learning and analyze both qualitative and quantitative data. Artificial data, analytic and machine learning help educators to deliver educational programmes for student via an immersive virtual environment. This approach helps to ensure the quality of distance learning, effective and efficient teaching and learning (Duggan, 2020).

In recent years, advances in artificial intelligence, machine learning and big data analytics have open up new opportunities for personalized learning. Personalized learning is one of the innovations that help educators to customize learning and respond to new educational perspectives. The new paradigm influences the quality of Education based on the characteristics and expectation of each student, such as personality, talents and individual goals and backgrounds. Each student has unique learning needs and Artificial Intelligence goal is to provide student with a personalized learning experience within the intelligent learning environment that facilitates knowledge acquisition and provide personalized feedback. Al can significantly automate and track student progress. Artificial Intelligence open up new opportunities to learn online and enrich their learning environment with adaptive learning materials, and meta cognitive cues. Artificial Intelligence increases engagement and improves learning outcomes. Artificial Intelligence help educators to record academic achievement, developed personalized learning materials, provide reviews and analyze data.

Artificial Intelligence in Education has changed not only the Education system but knowledge sharing approaches to learning, cognition and development of civilization (Kaur, 2021). Artificial Intelligence are made available to teachers and student, it assists educators to craft courses that are customized to the students needs and interests. It creates growing awareness to new technological solution that provides alternatives for students and promotes new teaching and learning methods. The advances in artificial Intelligence have led to the

development of personalized pathway in learning. Artificial Intelligence stimulates human listening (machine translation, speech recognition), speech (speech synthesis, human-computer dialogue), observation (computer vision, recognition, images, text recognition) Thinking (Theorem proving) Learning (machine learning, intelligent adaptive learning,) and Action (robotics) Huang, Saleh, & Liu, 2021. Today, artificial intelligence is one of the tools used in learning Analytics to analyze student knowledge (as well as their learning engagement strategies) in order to restructure effective personalized learning and develop supportive strategies in all stages of Education.

Personalized learning system help to analyze mastery of skills, provide students with the best Educational activities and encourage student to learn at their own pace as they master skills and progress towards learning goals. Personalized learning leads to the building of customized learning pathways that make learning more effective and emphasizes learning specific goal related to the learning objective (Baker, 2021). Artificial Intelligence is the technology which can help teachers and students. It provides intelligent tutoring system. It is based on dialogue-based and exploratory environment. Computer assisted instruction is an important feature of personalized tutor. Al facilitates augment classrooms; it facilitates stronger human-machine interaction. Student can get virtual assistance and well-organized curriculum. It will eliminate the boundaries for learning. It provides great Education for young people.

Personalized learning approach increases student motivation and engagement, which improves academic performance., Personalized learning can be an efficient approach that can increase motivation, engagement and understanding (PontualFalcao, e Pere, Sales de Moraise and da Silva Oliveria, 2018), maximizing learners satisfaction, learners efficiency, and learning effectiveness (G'omez, Zervas, Sampson & Fabregat, 2014). Personalized learning system can adapt itself when providing learning support to different learners to defeat the weakness of one-size-fit-all approaches in technology-enabled learning system. The goal is to have learning system that can dynamically adapt itself based on a learner's characteristics and needs to provide personalized learning. Human one-on-one tutor can do this now and now it is possible for digital system to do so as well.

A number of Al system are now commercially available which can mimic the effect of one-to-one tutoring by being able to understand the skill level of a students and tailor materials to suit their level. Some system can also understand how a student thinks during problem solving and provide feedback and guidance to the student, in addition to correcting erroneous behavior. Al is also being used in the field of content delivery where educators can create a syllabus and use Al to then fill in the core content of a book that holds true to the syllabus TTL (2017).

Machine Learning (ML) is a branch of artificial intelligence (AI) that focuses on the development of algorithms and statistical models that enable computers to learn and improve from experience without being explicitly programmed. It represents a paradigm shift in computing, allowing systems to automatically identify patterns, make decisions, and improve performance over time based on data.

At the core of machine learning is the idea that machines can learn from data. Instead of being manually coded to perform specific tasks, machine learning models are trained using large datasets, where the system identifies underlying structures or trends and uses these insights to make predictions or take actions. This learning process can be supervised, unsupervised, or reinforced, depending on the type of data and the nature of the problem. In supervised learning, the model is trained on labelled data, where both the input and the

desired output are provided. The goal is for the model to learn the mapping between the two so it can accurately predict outcomes for new, unseen data. Common applications include spam detection in emails, fraud detection in banking, and disease diagnosis in healthcare. Unsupervised learning, on the other hand, deals with unlabelled data. Here, the algorithm attempts to discover hidden patterns or groupings within the data. Clustering and dimensionality reduction are common unsupervised learning techniques used in applications such as customer segmentation, market research, and anomaly detection. Reinforcement learning is a third category where an agent learns to make decisions by interacting with an environment. It receives feedback in the form of rewards or penalties and adjusts its strategy to maximize cumulative rewards over time. This type of learning is widely used in robotics, game playing (such as AlphaGo), and autonomous vehicles.

Machine learning has become increasingly pervasive across industries. In finance, it powers algorithmic trading and risk assessment. In healthcare, ML models assist in disease prediction, image analysis, and personalized medicine. In education, machine learning is used to develop adaptive learning platforms and intelligent tutoring systems. Retailers apply ML to optimize pricing strategies, forecast demand, and personalize customer experiences. Furthermore, it plays a crucial role in natural language processing, speech recognition, and computer vision—technologies that form the foundation of digital assistants and smart devices (Afolabi, & Omidiora, 2020)

Adaptive Learning Platforms Leverage Artificial Intelligence to dynamically adjust the learning experience based on individual students' progress. These platforms use AI algorithms to analyze student data, such as assessment results and learning behavior, to personalize the content, pace, and sequence of instruction. For instance, newton adaptive learning platform uses Al to continuously assess student knowledge and create personalized learning paths. Studies have demonstrated the effectiveness of adaptive learning platforms in improving student's achievement and motivation (Taylor, Yeung & Bashet, 2021).

Intelligent Tutoring Systems (ITS) utilize Artificial Intelligence algorithms to provide personalized instruction and feedback to student. These systems can assess student's knowledge and skills, identify areas of weakness, and deliver customized learning materials, and activities. For instance, the cognitive tutor software developed by Carnegie Learning uses Al techniques to adapt the curriculum to individual student's performance and provide tailored feedback. Such systems have shown promising results in improving students learning outcomes and engagement.

Chatbots equipped with Al capabilities can offer personalized support and guidance to learners (Ikpesu & Kayii, 2023).

Business Education is an aspect of vocational education that is incorporated into the Nigerian Education System right from the junior secondary school for a gradual skill development. Business Education is a broad area of knowledge that deals with the entire enterprise system, preparing recipients for roles in business as employees or employers (Onajaife, 2019). Business Education equips it's recipients to achieve total development. The goal of Business Education in this electronic world is to provide student with hand-on, technical training that prepares them for the rapidly evolving 21st century workforce. Business Education is based on a vision and set of competencies designed to prepare students to become knowledgeable and ethical decision makers as they fulfill their roles as consumers, workers, citizens and also contribute to the development of the society. In the academic arena, Business Educators play a prominent role in preparing students to become responsible citizens capable of making the astute economic decisions that will benefits their personal and professional lives

(Ogungboyega, 2019). Akinpelu (2017) viewed Business Education as an aspect of total Education program that provides functional and saleable skills, knowledge, understanding; attitude, value needed to perform in the business world as producers or consumers of goods and services that all business offers.

Statement of the Problem

"The traditional teaching methods employed in Business Education graduate programs often fall short in catering to the diverse learning needs, styles, and pace of individual students. This one-size-fits-all approach can lead toSuboptimal academic performance, diminished career readiness, reduced employability, inadequate preparation for the complexities of the modern business world.

Furthermore, the rapid pace of technological advancements in the business world necessitates a more adaptive, responsive, and personalized learning approach. The increasing demand for skilled professionals who can navigate complex business environments, think critically, and solve problems creatively underscores the need for innovative educational strategies.

Despite the potential of Artificial Intelligence (AI) to revolutionize the learning experience, its application in Business Education graduate programs remains limited. AI-powered personalized learning systems can analyze individual learning styles and preferences, provide personalized learning pathways, offer real-time feedback and assessment, enhance student engagement and motivation.

However, the effective integration of AI in Business Education graduate programs poses significant challenges, including limited understanding of AI's potential and limitations,insufficient technical infrastructure, concerns about data privacy and security, need for faculty training and support.

This study aims to explore the potential of AI in facilitating personalized learning experiences for Business Education graduate students, addressing the challenges and limitations associated with its implementation, and providing recommendations for effective integration."

Purpose of the Study

The study investigated utilizing the power of Artificial intelligence for personalized learning of Business Education graduate students in River's state universities. Specifically, the study sought:

1. To determine the extent to which Business Education graduate students of Rivers State University and Ignatius Ajuru University utilize Adaptive Learning Platforms for personalized learning in their universities.
2. To determine the extent to which Business Education graduate students of Rivers State University and Ignatius Ajuru University utilize Machine learning for personalized learning in their universities.

Research Questions

The following Research questions guided the study.

1. To what extent do Business Education graduate students of Rivers State University and Ignatius Ajuru University utilize Adaptive Learning Platforms for personalized learning in their universities?

2. To what extent do Business Education graduate students of Rivers State University and Ignatius Ajuru University utilize Machine learning for personalized learning in their universities?

Hypotheses

The following Null Hypotheses were formulated and tested at 0.05 significant level:

1. There is no significant difference in the mean ratings of Business Education graduate students of Rivers State University and Ignatius Ajuru University of Education on the extent to which Adaptive Learning Platform is utilized for personalized learning in Rivers State Universities.

2. There is no significant difference in the mean ratings of Business Education graduate students of Rivers State University and Ignatius Ajuru University of Education on the extent to which Machine Learning is utilized for personalized learning in Rivers State Universities.

Review of Empirical Studies

Several scholars have examined the role of emerging technologies such as Adaptive Learning Okobioko (2019) investigated the effect of Adaptive Learning Tools on high school students' performance in Kenya using a descriptive survey design. Data were collected from 544 students across six schools with the aid of a standardized questionnaire (ALTPSHSQ). Findings showed that Adaptive Learning Tools significantly improved students' engagement, motivation, and academic performance. This study is related to the present research as it demonstrates the effectiveness of adaptive technologies in enhancing learning outcomes. However, while Okobioko's work focused on high school learners, the present study emphasizes ALPs for personalized learning among postgraduate Business Education students.

Similarly, Jide and Aksiz (2020) explored the effectiveness of Machine Learning in enhancing the learning experiences of senior secondary school students in Ondo State through qualitative interviews with 200 students. Their results revealed that ML provided richer learning experiences than traditional methods, highlighting its potential to transform classroom instruction. While this study supports the relevance of ML in education, it differs from the present research, which applies ML to personalized learning for Business Education graduate students rather than general secondary school learners.

Huanhuan et al. (2023) conducted a systematic literature review of 40 studies on Adaptive Learning Platforms in real educational contexts in China between 2011 and 2022. The review highlighted both opportunities and challenges, noting regional gaps in adoption and a tendency for studies to focus more on learning performance than on non-cognitive or social outcomes. The authors also pointed out methodological weaknesses in experimental designs, underscoring the need for more rigorous research. Their findings are relevant to the present study as they underscore the broad applicability of ALPs, though the current investigation narrows the scope to personalized learning in Business Education postgraduate programmes.

Festa and Joel (2018) also investigated technological adoption in education by examining the adequacy of Machine Learning applications in teaching and learning Commerce in Bayelsa State senior secondary schools. Employing a descriptive survey with a sample of 585 students and teachers, they found ML applications to be adequate in promoting instructional effectiveness and student engagement. While this aligns with the present study's interest in ML, their research was limited to secondary school Commerce education, whereas the

present focus is on postgraduate-level personalized learning. In a more recent study, Faisal and Carabella (2023) examined Business Education graduate students' perceptions of Adaptive Learning Platforms in academic writing and personalized learning. Based on survey responses from 45 students in Port Harcourt, 76% expressed positive views, citing improvements in clarity, tailored feedback, and confidence. However, 24% raised concerns about contextual accuracy, particularly with Nigerian English usage. The study concluded that ALPs hold strong potential in under-resourced contexts but must be culturally and linguistically adaptive. While closely aligned with the present research in its focus on postgraduate Business Education students, the study was limited to academic writing, whereas the current investigation explores broader applications of ALPs and ML in personalized learning. Together, these studies highlight the growing evidence that Adaptive Learning Platforms and Machine Learning can significantly enhance educational experiences across different levels of learning. However, gaps remain in understanding their broader use for personalized learning in postgraduate Business Education, which the present study seeks to address.

METHODOLOGY

The study employed a descriptive survey research design. The choice of the design was considered appropriate because it enabled the researcher to elicit detailed and accurate information on the use of Artificial Intelligence for personalized learning among Business Education graduate students in Rivers State universities. The descriptive survey approach was suitable since the study involved collecting data from respondents through a structured questionnaire.The population of the study comprised 225 Business Education postgraduate students drawn from Rivers State University and Ignatius Ajuru University of Education during the 2022/2023 and 2023/2024 academic sessions. This consisted of 68 Masters and 23 Ph.D. students from Rivers State University and 95 Masters and 39 Ph.D. students from Ignatius Ajuru University of Education, giving a total of 225 postgraduate students. Since the population size was small and manageable, the study adopted a census approach; hence, all 225 students formed the sample size for the study.The instrument for data collection was a structured questionnaire developed by the researcher after reviewing relevant literature. The questionnaire was titled *Utilizing the Power of Artificial Intelligence for Personalized Learning of Business Education Graduate Students (UAIPLBEGS)* and was divided into two parts. The first part elicited demographic information of the respondents, while the second part contained thirty (30) items designed to generate data on the extent of AI utilization for personalized learning. The instrument was structured on a four-point Likert scale of Very High Extent (VHE = 4), High Extent (HE = 3), Moderate Extent (ME = 2), and Low Extent (LE = 1).The face and content validity of the instrument were established by three experts: two in Business Education and one in Measurement and Evaluation, all from the Faculty of Education, Rivers State University, Port Harcourt. The experts reviewed the items in terms of clarity, coverage, and relevance to the research objectives. A reliability coefficient of 0.87 was obtained, indicating that the instrument was reliable for the study. Data collected were analyzed using Weighted mean and standard deviation were employed to answer the research questions, while the null hypotheses were tested using the t-test at 0.05 level of significance. The decision rule was that any mean score above 2.50 was considered high extent, while scores below 2.50 were regarded as low extent. For hypotheses testing, the null hypothesis was retained if the calculated t-value was less than the critical t-value, but rejected if the calculated t-value exceeded the critical value.

Results

Research Question One: To what extent do Business Education graduate students of Rivers State University and Ignatius Ajuru University utilize Adaptive Learning Platforms for personalized learning in their Universities?

Table 1: Mean and Standard Deviation response on the extent to whichBusiness Education graduate students of Rivers State University and Ignatius Ajuru University utilize Adaptive Learning Platforms for personalized learning in their universities. N= 220

S/N	ITEMS	MEAN	S. D	REMARK
1	Detects when learners are struggling and prompts timely support.	3.51	0.87	**High Extent**
2	Tests learner understanding in real time and adjusts accordingly, leading to better preparedness.	3.47	0.88	**High Extent**
3	Can cater to thousands of learners at once while still offering individual experiences	3.42	0.92	**High Extent**
4	Supports remote and mobile learning, making education more accessible and flexible.	3.38	0.93	**High Extent**
5	Empowers students to take control of their learning journey with less reliance on instructors.	3.45	0.87	**High Extent**
6	Generates analytics reports that help instructors monitor progress and identify areas of improvement.	3.46	0.83	**High Extent**
	Grand Mean	**3.45**	**0.88**	**High Extent**

Source: Field Survey 2025

The table 1 shows the mean scores and standard deviations for six items assessing how Business Education graduate students at Rivers State University and Ignatius Ajuru University utilize adaptive learning platforms for personalized learning. Item 1, on detecting when learners are struggling and providing timely support, has the highest mean score of 3.51 and a standard deviation of 0.87, indicating strong student agreement. Item 2, which measures real-time testing and adjustment of learning content, follows closely with a mean of 3.47 and SD of 0.88. Item 3, addressing scalability with personalized experiences, has a mean of 3.42 and SD of 0.92. Item 4, about support for remote and mobile learning, recorded the lowest mean score of 3.38 and the highest SD of 0.93, showing slightly lower agreement and more variation in responses. Item 5, on promoting student independence, scored a mean of 3.45 with SD 0.87, while Item 6, focused on analytics reports for tracking progress, had a mean of 3.46 and the lowest SD of 0.83, reflecting consistent responses with a grand mean of 3.45 and a standard deviation of 0.88 shows a high extent that Business Education graduate students of RSU and IAUE utilize adaptive learning platforms to a high extent.

Research Question Two: To what extent do Business Education graduate students of Rivers State University and Ignatius Ajuru University utilize Machine learning for personalized learning In their Universities?

Table 2: Mean and Standard Deviation response on the extent to whichBusiness Education graduate students of Rivers State University and Ignatius Ajuru University utilize Machine learning for personalized learning in their universities. N= 220

S/N	ITEMS	MEAN	S. D	REMARK
7	Promotes over-dependence on AI tools, weakening students' ability to conduct independent research and solve problems without assistance	2.29	1.07	low extent
8	Occasionally gives inaccurate or misleading feedback, which can result in students learning incorrect information	2.30	1.09	low extent
9	Encourages over-standardization by focusing mainly on test scores, which stifles creativity and critical thinking	2.20	1.07	low extent
10	Reduces meaningful human interaction by replacing teachers with AI, leading to a loss of emotional support and motivation	2.27	1.11	low extent
11	Provides narrow learning recommendations, limiting students' exposure to diverse topics and perspectives.	2.28	1.09	low extent
12	Undermines the role of teachers by shifting control and decision-making from educators to algorithms	2.29	1.09	low extent
	Grand Mean	**2.27**	**1.09**	**Low Extent**

Source: Field Survey 2025

The table shows the extent to which Business Education graduate students at Rivers State University and Ignatius Ajuru University utilize machine learning for personalized learning, specifically focusing on potential negative aspects. Item 7, concerning over-dependence on AI tools that may weaken independent research skills, has a mean of 2.29 and a standard deviation of 1.07, indicating low to moderate utilization with some variation. Item 8, about occasional inaccurate or misleading feedback from machine learning tools, scored a mean of 2.30 and SD of 1.09, reflecting limited but noticeable use in this regard. Item 9, addressing over-standardization focused mainly on test scores, recorded the lowest mean of 2.20 and SD of 1.07, suggesting minimal utilization of machine learning features that restrict creativity. Item 10, which relates to reduced human interaction and emotional support due to AI replacing teachers, had a mean of 2.27 and the highest SD of 1.11, indicating varied perceptions of utilization in this area. Item 11, concerning narrow learning recommendations, showed a mean of 2.28 and SD of 1.09, while Item 12, about algorithms undermining teacher roles, also had a mean of 2.29 and SD of 1.09With a grand mean of 2.27 and a standard deviation of 1.09, the result suggests that the utilization of machine learning for personalized learning by Business Education postgraduate students of RSU and IAUE is to a low extent.

Hypothesis Testing

Ho1; Business Education graduate students of Rivers State University and Ignatius Ajuru University do not differ significantly in their mean ratings on the extent to which Adaptive Learning Platforms is utilized for personalized learning in their universities.

Institution	Mean	S.D	alpha-level	df	t Stat	P- Value	t Criti	Remark
RSU	9.00	1.33	0.05	16.00	-0.21	0.84	2.12	**Retained**
IJAU	9.29	4.87						

Source; Field Survey 2025

The hypothesis sought to determine whether a significant difference exists in the mean ratings of Business Education graduate students at Rivers State University (RSU) and Ignatius Ajuru University (IAUE) regarding the extent to which Adaptive Learning Platforms are utilized for personalized learning. The data show that RSU students had a mean rating of 9.00 with a standard deviation of 1.33, while IAUE students recorded a slightly higher mean of 9.29 and a larger standard deviation of 4.87. The t-statistic value is -0.21, and the p-value is 0.84 at an alpha level of 0.05 and 16 degrees of freedom. Since the p-value (0.84) is greater than the alpha level (0.05) and the calculated t-statistic (-0.21) falls within the range of the critical t-value (±2.12). The hypothesis test revealed no significant difference in the mean ratings of RSU and IAUE Business Education graduate students regarding their use of Adaptive Learning Platforms for personalized learning, hence the null hypothesis was retained.

Ho2: Business Education graduate students of Rivers State University and Ignatius Ajuru University do not differ significantly in their mean ratings on the extent to which Machine Learning is utilized for personalized learning in their universities.

Institution	Mean	S.D	alpha-level	df	t Stat	P-- Value	t Crit	Remark
RSU	9.00	2.62	0.05	22.00	-0.23	0.82	2.07	**RETAIN**
IJAU	9.29	3.38						

Source; Field Survey 2025

The analysis showed that RSU students had a mean score of 9.00 (SD = 2.62), while IAUE students had a slightly higher mean of 9.29 (SD = 3.38). The calculated t-statistic was -0.23 with 22 degrees of freedom, and the p-value was 0.82. At a 0.05 level of significance, and with a critical t-value of ±2.07, the p-value exceeded the alpha level. Based on this result, the null hypothesis was retained, indicating no significant difference between the mean rating of RSU and IAUE Business Education graduate students in their use of Machine Learning for personalized learning.

DISCUSION OF FINDINGS

Adaptive Learning Platforms for Personalized Learning

The findings reveal that Business Education graduate students perceive adaptive learning platforms as valuable tools for personalized learning. This perception aligns with the views

expressed by respected Business Education lecturers at Rivers State University, such as Eke, Obidike, and. Ikonne (2022), who have highlighted the increasing importance of technology-driven instructional methods in enhancing student engagement and tailored learning experiences. The emphasis on the system's capability to detect when learners are struggling and provide timely support resonates with Eke's (2018) work on instructional strategies, which underscores that timely feedback and adaptive interventions are critical for supporting diverse learner needs. Similarly, Obidike (2019) has stressed the importance of learning technologies that dynamically adjust content to match individual progress, which reflects the students' positive view of real-time testing and content modification. Scalability and promotion of learner independence, identified in the findings, are consistent with. Ikonne's (2022) research on self-directed learning in Business Education. He advocates for learning environments that empower students to control their learning pace and paths, a fundamental feature of adaptive learning platforms.

The slightly varied perceptions regarding support for remote and mobile learning reflect challenges that have been acknowledged by other Rivers State University lecturers, including Okafor. Okafor's (2023) work points to infrastructural limitations and uneven access to technology as major factors influencing the effectiveness of remote learning solutions. This aligns with the observed variability in student responses and highlights a need for more robust strategies to enhance accessibility and user experience in mobile and remote learning contexts. The consistent recognition of analytics for tracking learning progress aligns with the views of Nwosu (2021), who emphasizes the role of learning analytics in providing actionable insights for both students and instructors. According to Nwosu (2021) these analytics facilitate continuous monitoring and targeted support, which are essential for personalized learning and improving educational outcomes.

Regarding the comparison between institutions, the absence of a significant difference in adaptive learning platform utilization suggests a similar level of adoption and integration across Rivers State University and Ignatius Ajuru University. This is in line with the observations of Eke (2018), who notes that technological adoption in Business Education is becoming more standardized across Nigerian universities, driven by common curricular goals and pedagogical frameworks. In summary, these findings support the perspectives of leading Business Education scholars at Rivers State University regarding the strengths and challenges of adaptive learning platforms. The results affirm the platforms' role in facilitating personalized, scalable, and data-informed learning while highlighting ongoing challenges related to remote accessibility and infrastructure.

Machine Learning Technologies

The findings of research question two indicate a generally low extent utilization of machine learning technologies by Business Education graduate students at Rivers State University and Ignatius Ajuru University when it comes to potential negative aspects of personalized learning. This pattern suggests that while students are aware of machine learning tools, there is cautious engagement with features that might negatively impact their learning process or academic skills. One key area of concern highlighted is the over-dependence on AI tools potentially weakening independent research skills. This reflects broader academic discourse where scholars like Selwyn (2019) caution that excessive reliance on AI-driven learning tools can lead to diminished critical thinking and autonomous learning capacity. This phenomenon resonates with the students' responses, implying an awareness that while machine learning can support learning, it may also inadvertently reduce learners' ability to conduct in-depth research independently.

Similarly, the recognition of occasional inaccurate or misleading feedback from machine learning systems underscores the limitations inherent in current AI technologies. This aligns with findings by Luckin (2018), who pointed out that machine learning algorithms, although powerful, are not infallible and can produce errors or biased outputs that may mislead learners if not properly supervised.

The concern over over-standardization and its focus on test scores suggests a perceived restriction on creativity and holistic learning, which is a well-documented critique of many automated educational systems. Scholars like Williamson (2020) argue that machine learning applications in education can sometimes prioritize quantifiable outcomes at the expense of deeper cognitive and creative skills, limiting the richness of learning experiences.

Reduced human interaction and emotional support as a result of AI replacing teachers is another critical issue reflected in the findings. This is consistent with the views of researchers such as Rose and Dalton (2021), who emphasize the indispensable role of human educators in providing not just academic guidance but also emotional and motivational support — elements difficult to replicate through AI. The identification of narrow learning recommendations and algorithms potentially undermining teacher roles highlights ongoing tensions between technology and pedagogy. According to Selwyn (2019), while algorithms can personalize content delivery, their narrow focus risks constraining learning pathways and marginalizing teacher expertise, which remains central to adaptive and responsive education.

Regarding the comparison between the two institutions, the lack of significant difference suggests a shared cautious approach to machine learning's role in personalized learning. This similarity may reflect comparable levels of technological integration, pedagogical approaches, and student awareness across Rivers State University and Ignatius Ajuru University. It also suggests that concerns about the limitations and potential drawbacks of machine learning in education are broadly recognized among students. Overall, these findings contribute to the nuanced understanding of machine learning in education, highlighting both its potential and its pitfalls. They affirm the need for balanced integration where machine learning tools are used to enhance, critical thinking, creativity, and the essential human elements of teaching and learning.

The study concludes that while Artificial Intelligence is moderately to highly utilized for personalized learning among Business Education graduate students in Rivers State universities, there remains significant potential to enhance its adoption and optimize its benefits for more effective and inclusive learning experiences.

Recommendations

The following recommendations were made based on the study:

1. Students should actively engage with available Artificial Intelligence tools to maximize their personalized learning experiences and develop digital literacy skills essential for academic and professional success.
2. Lecturers should integrate AI technologies into their teaching strategies and continuously update their skills to effectively support and guide students in utilizing AI for personalized learning.

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