ASSESSING THE EFFECTIVENESS OF AI-POWERED BUSINESS EDUCATION PROGRAMME ON STUDENTS LEARNING OUTCOMES IN RIVERS STATE UNIVERSITIES

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Abstract

The purpose of the study was to assess the effectiveness of AI-Powered Business Education Programme on Students Learning Outcomes in Rivers State Universities. Two specific objectives, two research questions and two null hypothesis guided the study. The Population of the study consist of 41 Business Educators. The Entire population was studied as a sample size because, the population was manageable. A self-structured questionnaire titled" Assessing Effectiveness Of AI-Powered Business Education on students Learning outcomes Questionnaire (A E AI B E S L O Q), structured on a 4 – Point rating scale was the main instrument for data collection. The instrument was validated by three experts, One in Measurement and Evaluation and two in Business Education department, all from Faculty of Education, Rivers State University. The reliability of the instrument was established through test re-test method which yielded co-efficient of 0.89. Mean and standard deviation were used to answer research questions, while t-test was used to testy the null hypothesis at 0.05 level of significance. The findings of the study revealed that the use of natural language processing tools in AI-Powered Business Education programme significantly enhance students learning experience to a high extent, and that the use of virtual learning environment has the potential to revolutionize students learning outcomes to a high extent.

Based on the findings, it was recommended amongst others that Rivers State Universities should invest in virtual learning environment to improve accessibility to Business Education. This can be achieved by developing robust online platforms that provide flexible Learning opportunities and enable student engage with instructors remotely.

Keywords: Artificial intelligence, Business Education, Effectiveness and student learning outcome, AI – Powered Education.

Introduction

In recent times, there has been continuous growing trend in higher education to incorporation modem technologies and practice in order to improve the overall education experience as the future of higher education intrinsically linked with continuous development on new technologies and computing capabilities of new intelligent machines. The modem world of education has

shifted from manual ways of passing knowledge to faster system enabled by emerging technologies such as artificial intelligence.

Artificial Intelligence (AI) is the development of computer systems to be able to perform tasks normally requiring human intelligence. Such task includes: visual perception, speech recognition, decision-making and translation between languages. Thus, ITF (2021) explained that the emergence of artificial intelligence (AI) has made it important to take a look at learning methods and consider how facilitators/ lecturers/teachers and learners are spending their time. Artificial intelligence (AI) is the simulation of human intelligence processes by machines, especially computer systems and therefore, it is a set of computational techniques inspired by the way humans use their nervous system and their body to feel, learn and act. Artificial Intelligence (AI) applications are important in the field of human endeavours. But of recent, it is more important in the field of educational institution and universities. The mandate of tertiary intuitions transcends the traditional functions of preserving heritage, identity and education. It is rather required to keep pace with emerging technological development through the creation of new methods of education and teaching. For the purpose of this study, the researchers are interested in assessing the effectiveness of the use of natural language processing tools and Virtual Learning environment for Business Education students learning outcomes

Natural Language processing tools (NLPT) are sophisticated software applications that enables computers to process, comprehend and generate human language and transforming the way humans interact with technology.

These tools have the ability to analyze and interpret text, extracting meaning, sentiments and context from vast amount of data (Adelani, 2021). They also generate human-like text, creating personalized responses, summaries and even entire article from virtual classrooms to personalizing learning experiences, natural language processing enhances educational practices, promoting clearer communication and deeper understanding among students and educators alike (Dan, Christopher, Tin & Ogunrinde, 2024) Natural language processing tools are a basic domain in artificial intelligence which exclusively concentrates on computer.

And Linguistic interface (Amir, 2025). Amir (2015) defined natural language processing as a subset of artificial intelligence focused on the interaction between computers and human (natural) languages. According to Jurafsky and Martin (2019), natural language processing aims at facilitating the hardware with the capacity to comprehend, analyze or produce language or discourse in a reasonable and productive manner. Many natural language processing tools such as speech recognition, machine transaction, text summarization or sentiment analysis are changing many types of communication, especially in education or academic environments (Amir, 2025). These abilities according to Amir (2025), facilitate the processing of massive databases and contents, therefore, making it possible to monitor data as well as generate reports or narratives with very little assistance from humans.

Natural language processing is becoming increasingly sed in the field of literary analysis as it is able both to the writers and generate text; in fact, it opens doors for lecturers through which they can consider such things as themes, linguistic patterns and stylistic features in volumes of works that would be well beyond human capability. Natural language processing tools will also enable more advanced forms of digital storytelling, allowing students to interactively engage with literature in new ways, from hypertext fiction to choosing our-own advantage stories. In Nigeria, a country known for its vibrant cultural heritage and dynamic media landscape, the integration of natural language processing presents both existing opportunities and significant challenges (Oyeniyi & Uthman, 2024). Oyeniyi and Uthman (2024) further stated that with over 500 languages spoken across the country and a rich tradition of oral and written language, natural language processing tools have the potential to preserve and promote indigenous" languages by facilitating machine translation, speech recognition and language processing tools in local dialects (Adelani, 2021). Natural language processing enables machines to process, understand and generate human language in a valuable way.

Jurafsky and Martin (2019) opined that natural language processing encompasses various tasks which includes language modeling, text generation, speech recognition, sentiment analysis and machine translation. Chollet (2019) stated that the capacity to process natural processing language at scale means that media outlets can produce content more effectively and efficiently with audience as their target. Natural language processing tools which enable machines to understand spoken felines to understand spoken or written human language are helping in the development of models for analyzing student feedback, predicting student satisfaction and performance as well as identify important feedback that requires immediate action (Sunar & Khalid, 2020).

Timothy, Nokes-Malach, Elizabeth and Soniya (2015 opined that natural language processing style of teaching provides several key benefits by encouraging students to engage in hands-on dealing with natural language processing challenges. Timothy et al (2015) further stated that it brings diverse perspectives into the classroom, representing the diversity of background and also reflecting the interdisciplinary nature of natural language processing. As natural language processing is a rapidly evolving field with new techniques emerging this teaching methodology encourages experimentation and the sharing of findings with peers and teachers. In this way, such a teaching methodology builds a community within the classroom where everyone feels valued and encouraged to participate actively. Other artificial intelligent tools such as virtual learning environment are equally useful for teaching and learning as it will bring about students learning outcomes.

Vital Learning environment (VLE) is an online platform that enables students to access educational resources, participates in learning activities and interact with instructors and peers remotely (Loki2, 2011). Virtual Learning Environment provides flexible and accessible way to learn and often used online courses are assessed on the internet. The dynamic nature of Business Education programme makes it necessary to adopt a delivery pattern which is also dynamic, resounding, hence, virtual AI learning.

Virtual learning is not a factor that is confined to the walls of a traditional classroom. Mangal (2009) defined virtual learning environment as the classrooms capable of replacing partially or totally the conventional educational, evaluative and administrative functioning of regular classroom by adopting the advanced computer and Information and Communication Technology technologies like the internet, e-mail, on-line chatting, www, CD-ROMs, DVDs, tele-conferencing and video conferencing. Also, Pellet and Lacarte (2013) defined virtual learning environment as computer-based environments that are relatively open systems, allowing interactions and encounters with other participants and providing access to wide range of resources.

According to Lokie (2011), Virtual learning expands the possibility of using internet facilities, platforms satellite links and related system to access, analyze, create, exchange and use data, information and knowledge in ways which until recently were almost unimaginable. In effect, virtual learning involves learning acquired by students through the interaction of digitally delivered content.

Virtual learning environment is actualized through various processes such as online learning, web-based training and technology delivered instructions. Pellet and Lecarte (2013) opined that virtual classroom operates by allowing interactions and encounters with other participants who equally have access to a wide range of resources. According to Merrit (2009), virtual learning environment provides tools that are customized for education as even in higher institutions these tools have become very popular for learning among the students because of the increase in internet technology.

The acceptance that actions which appeal to the sense organs of sight, touch, smell and body kinetics create better and lasting impressions on an individual is a good background for the motion to adopt virtual learning in the teaching of Business Education courses. Dess Wr (2008)

viewed virtual learning as an advanced form of computer simulation which exposes students to a simulated environment that is virtually the same as the physical environment which controls what the student is able to see, feel and sense. The student learns by interacting with the objects in the electronic environment to achieve some goals. According to Anioke (2005), the effectiveness of every instructional strategy depends on its ability to appeal to the sense of hearing, seeing, attract attention and sustain such attention as well as focus the attention on essential element to be learned at a given time.

Effectiveness is a crucial concept that refers to the degree to which something achieves its intended purposes or goal. According to the Oxford Dictionary, effectiveness is the degree to which something is successful in producing a desired result (Oxford Dictionary, n.d). In essence, effectiveness measures the extent to which a particular intervention, strategy or solution produces the desired outcomes. In education (Business education inclusive) effectiveness is critical for improving students learning outcomes. Research has shown that effective teaching methods can significantly impact student learning outcome (Hattie, 2009).

Learning outcome are the specific knowledge, skills and abilities that students are expected to demonstrate upon completing a course, programmer or degree. In essence, student learning outcome defines what students should know, understand and be able to do as a result of their educational experiences. Student learning outcomes are crucial aspect of education, as they provide a clear direction for teaching and learning. By establishing clear student outcomes, educators can design curricula, assessments and instructional strategies that are aligned with the desired outcomes in Business Education. The use of technology in teaching of Business Education can be result – oriented and of critical significance to the future.

Virtual Learning / Environment with its internet facilities provides both educators and learner with opportunities of accessing learning materials from across borders. These materials enhance the learner's creativity and research abilities. Learners who are online can easily connect with other learners in the same field across the globe, thereby enhancing knowledge sharing among the learners. Business educators are not isolated from the impact of artificial intelligence as they can connect to their colleague's worldwide (Ogwunte & Agburaga, 2024). These teachers according to the authors can share their materials and teaching experience with their colleagues from different parts of the world. Stressing further, Ogwunte & Agburaga, (2024) stressed that with the aid of artificial intelligence in Business Education, learners and business educators from different background are provided with opportunity to interact directly worldwide. This shows the effectiveness of Artificial Intelligence in Business Education Programme.

Authors have defined Business Education in several ways. Koko (2019) stated that Business Education is an aspect of vocational/technical education which aims is to train individual for me application of practical skills needed for gainful employment. Bupo and Abam (2017) opined that Business Education is a progrmame of study that equips the students with the right knowledge and skills needed to either be employed in a business setup or teach business or create employment by themselves. Ubulom and Singer (2017) explained that Business Education programme is a subset of vocational education which entails the acquisition of skills, attitude and knowledge to enable it's graduates function effectively in the world of words and propel the attainment of the First Millennium Development Goal.

Okiridu, Boms and Mbata (2018) posted that Business Education encompasses knowledge, attitudes, and skills needed by all citizens in order to effective manage their personal business and economic system. Val-Ossai and Akpomi (2017) explained that Business Education is an educational programme which involves acquisition of skills, knowledge and competencies which makes the recipient/beneficiary proficient, m the context of this study, the researcher defined Business Education as a programme that prepares students for careers in classroom, business, industry and related fields. It encompasses a broad range of topics, including accounting, marketing, management and entrepreneurship.

Statement of the Problem

Business offices are now embracing the new trend in Information and Communication Technology as a new toots for improved business activities without a corresponding change in the teaching and learning of course in Business Education programmes. Despite the clamor for use of electronic devices in modem offices. Business Education programme in universities in Rivers State seem not to be equipping their recipients with the necessary skills needed to function effectively in these offices. This shortfall may be occasioned by inability of the lecturers to use technologies in preparing, delivery and management of their instructions. Though there may be available equipment but it is disheartening that most of these resources are either not in use or under used.

Consequently, graduates of Business Education are reportedly lacking basic competencies needed in modem offices. Basic competencies they could have acquired in the use of Artificial Intelligence technologies, such as Natural Language Processing tools and Virtual learning environment seems to have eluded them because of lack of/or poor exposure to these technologies in the cause of their training. This competency impoverishment of the students has contributed to their poor performance in modem offices vis-a-vis their been unfit in modem business environment. In light of the above, this study assess the effectiveness of AI-powered Business Education Programme on students Learning Outcomes in Rivers State Universities.

Research Questions

The following research questions guided the study.

1. To what extent is the use of natural Language processing tools effective on students learning outcomes in Rivers State Universities?
2. To what extent is the use of virtual learning Environment effective on students Learning Outcomes in Rivers State Universities

Hypotheses

The following null hypothesis formulated were tested at 0.05 level of significance

1. Business educators in Rivers State University and Ignatus Ajuru University of Education do not differ significantly in their mean ratings on the extent to which the use of natural language processing tools are effective on students learning outcomes in Rivers State Universities.
2. Business Educators in Rivers State University and Ignatius Ajuru University of Education do not differ significantly in their mean and the extent to which the use of virtual learning Environment is effective on students learning outcomes in Rivers State Universities.

Methods

This study adopted a descriptive research design, and the area of the study was Rivers State. The Population of the study consist of 41 Business Educators. The breakdown of the population shows that Rivers State University (RSU=30) and Ignatius Ajuru University of Education (IAUE = 11). The entire population was studied because, it was manageable. The instrument used for data collection for this study was a self-structured questionnaire developed by the researchers titled "Assessing Effectiveness of AI-Powered Business Education on Students Learning outcomes Questionnaire (AEAIBESLOQ).

The questionnaire was designed on a 4-point rating scale of: Very High Extent (VHE-4-point), High Extent (HE-3 points). Moderate Extent (ME-2 points) and Low Extent (LE -1 points). The instrument was validated by three experts, one in Measurement and Evaluation and two in Business Education Department, all from the Faculty of Education, Rives State University. In order to establish reliability of the instrument, test re-test method was adopted, scores obtained were correlated using Parsons Product Moment Correlation Co-Efficient (PPMC) which yielded reliability co-efficient of 0.89, Out of 41 copies of the instruments administered, 40 were successful retrieved and used for the study. Mean and strand deviation were used to answer the research questions, while t-test inferential statistics was used to test the formulated hypotheses at

0.05 level of significance. A null hypothesis was retained if the t-calculated value is greater than the t-critical table value, and was not retained if reverse is the case.

Result

Research Questions 1: To what extent is the use of natural language processing tools effective on students learning outcomes in Rivers State Universities

Table 1: Mean and standard Deviation on the extent Business Educators in Rivers State Universities Rate the effectiveness of the use of natural Language Processing Tools on students Learning Outcomes …….. (N=40)

S/N	Use of Natural Language Processing Tools	Mean	SD	Remarks
1	Natural Language processing tools have improved my understanding of complex concepts in Business Education	3.87	0.67	VHE
2	The use of natural Language, process tools has enhanced my critical thinking and problem solving skills	2.89	0.88	HE
3	Natural Language processing tools hae made more engaging and interactive	2.76	0.73	HE
4	Natural language processing tools have provided me with personalized feedback and guidance	3.03	0.73	HE
5	I believe that Natural Language processing tools have	3.36	0.91	HE
	Grand Mean (x)	3.18	0.78	HE

Source: Field Survey 2025

Table 1 shows the extent Business Educators Rate the use of Natural Language processing tools to be effective on students learning outcomes. Out of the 5 items listed, one affirmed very high Extent, while the remaining 4 affirming to a High Extent. The grand mean of (3.18) confirmed the rating of "High Extend" while the standard deviation sources shows that the responses were relatively homogenous as they clustered around their means.

Research Question 2: To what extent is the use of virtual learning environment effective on students Learning Outcomes in Rivers State Universities?

Table 2: Mean and standard Deviation on the extent Business Educators in Rivers State Universities Rate the effectiveness of the use of Virtual Learning Environment on students Learning Outcomes …….. (N=40)

S/N	Use of Virtual Learning Environment	Mean	SD	Remarks
1	The Virtual Learning process has helped me achieve my learning goals in Business Education courses	2.88	0.87	HE
2	I have seen an improvement in my understanding of Business education course materials since using virtual learning Environment	2.71	0.72	HE
3	The Virtual Learning Environment has allowed me to access course materials and learn at my own pace	3.11	0.89	HE
4	The technical support for the virtual learning environment has been adequate and responsive	3.00	0.71	HE
5	I am satisfied on the overall quality of the virtual learning environment	3.29	0.91	HE
	Grand Mean (x)	2.99	0.82	HE

Source: Field Survey 2025

Table 2 Shows the extent Business Educators rate the use of virtual learning environment for effectiveness on students learning outcomes. Out of the 5 items listed, all the items were affirmed by the respondents to a high extent.

The grand mean of (2.99) confirmed the rating "High Extent", while the standard deviation scores shows that responses were relatively homogenous, as they clustered around their means

Hypothesis 1: Business Educators Rivers State University and Ignatius Ajuru University of Education do not differ significantly in their mean ratings on the extent to which the use of natural Language processing tools are effective on the students learning outcomes in rivers State Universities

Table 3: T-test of Difference in the mean ratings of Business Educators in Rivers State University and Ignatius Ajuru University of Education on the extent the use of Natural Language processing tools are Effective on students learning outcomes.

Respondents	N	Mean	Std	Df	t-cal	t-crit	a	Decision
RUS	28	3.63	0.93	38	3.55	1.699	0.05	Rejected
IAUE	12	2.73	0.63					

The result in table 3 shows that at a degree of freedom of 38 and at 0.05 level of significance, the t-calculated value of 3.55 is greater than the t-critical value of 1.699. The null hypothesis was rejected and the alternatyive hypothesis was retained.

Hypothesis 2: Business Educators in Rivers State University and Ignatius Ajuru University of Education do not differ significantly in their mean ratings on the extent they are ready to integrate wearable technologies (WT) in teaching accounting in Business Education progrmame.

Table 4: t-test of Difference in the Mean ratings of Business Educators in Rivers State University and Ignatius Ajuru University of Education on the Extent on the extent the use of Virtual Learning Environment is effective on students Learning Outcome.

Respondents	N	Mean	Std	Df	t-cal	t-crit	a	Decision
RUS	28	3.01	0.86	38	0.14	1.699	0.05	Accepted
IAUE	12	2.97	0.76					

The result in table 4 indicates that at a degree of freedom of 38 and at 0.05 level of significance, the t-calculated value of 0.14, is less than t- critical value of 1.99, the hypothesis was accepted and its alternative rejected.

Discussion of Findings

Findings of the study in research question one revealed the use of Natural Language processing tools in AI- Powered Business Education programme has been found to significantly enhance the learning experiences for students to a high context. This findings agreed with the assertion of Orji, Alt and Okanazu in Ndubusi, Ezeani and He (2022) who stated that emerging technology skills are highly required in vocational education in tertiary institutions to boost the digital literacy of teachers and students. Moreso, Business Education as a skilled Programme is expected to produce graduates fortified and prepared with AI technology skills for digital economy development. Also, the finding of the study in hypothesis one revealed that there is a significant.

Findings of the study in research question two also revealed that the use of virtual learning Environment (VLE) has the potential to revolutionize students learning outcomes to a high context.

The result shows that business educators are readu to integrate Virtual learning Environment in courses in Business Education Programme to a high extent. The finding corroborate the finding Jobberman in Uzoka and Okoli (2002), who revealed that graduates in Nigerian universities may hardly benefit due to the emerging technologies skills gap. Uzoka and Okoli: (2022) found lack of digital skills among graduate workers in Nigeria and attributed it to mismatch between the skills in demand within the digital sector and those that graduates possess. The findings of the study in hypothesis 2 revealed that Business Educators in Rivers State University and Ignatius Ajuru University of Education do not differ significantly in their mean ratings on the extent they are ready to integrate Virtual Learning Environment (VLE) in teaching Courses in Business Education Programme based on school type (Rivers State University and Ignatius Ajuru University of Education).

Conclusion:

The integration of AI-Powered Business Education programmes, leveraging on National Language Processing tools (NLPT) and virtual learning Environment (VLE), has the potential to revolutionize student learning outcomes in Rivers State Universities.

By Enhancing the Learning experience and improving accessibility, these programme (Business Education) can significantly benefit students and improve their academic performance

Recommendation:

Based on the findings and conclusion of the study, the researchers recommended that:

1. Rivers State Universities should integrate National Language processing tools into their business Education programmes to provide personalized feedback and improve Language skills.
2. Rivers State Universities should invest in Virtual learning Environment to improve accessibility to Business Education. This can be achieved by developing robust online platforms that provide flexible learning opportunities and enable students to engage with instructors remotely.

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