

ARTIFICIAL INTELLIGENCE FOR CREATIVITY AND INNOVATION IN BUSINESS EDUCATION AND ENTREPRENEURSHIP PRACTICE

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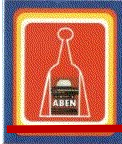
Abstract

The research examined the use of Artificial Intelligence in fostering creativity and innovation in the field of Business Education and Entrepreneurship, specifically focussing on tertiary institutions in Bayelsa State. The research included a total population of 649 students specialising in Business Education and Entrepreneurship Studies. A sample of 194 students, representing 30% of the total population, was chosen as the participants for the investigation. The data collection instrument used was a precisely crafted questionnaire comprising of 30 enquiries, which had been validated by experts in the respective domain. The instrument's reliability was assessed using the Cronbach Alpha reliability method, yielding a reliability value of 0.863. Out of the 194 copies of questionnaires that were sent, 187 were filled out and mailed back, yielding a return rate of 96.4%. The data were examined using descriptive statistics, which included measures of central tendency (mean) and variability (standard deviation), as well as t-test statistics. The study employed gathered and analysed data to identify 30 distinct approaches through which the utilisation of Artificial Intelligence (AI) tools and techniques can enhance the creativity, innovation, critical thinking, and problem-solving skills of students in Business Education and Entrepreneurship programs at tertiary institutions in Bayelsa State. The findings of the hypothesis suggest that there was no statistically significant impact ($p < 0.05$) of gender on the average evaluations provided by the participants. Nevertheless, the students' class had a statistically significant impact ($p < 0.05$) on their average scores. The research found that using AI tools and approaches in education would significantly enhance the creativity, originality, critical thinking, and problem-solving abilities of students in Business Education and Entrepreneurship programs. The study's results and conclusion propose a change towards AI-assisted instructions in Nigerian tertiary institutions to effectively administer Business Education and Entrepreneurship programs.

Keywords: Artificial intelligence, Creativity, Innovation, Business education, Entrepreneurship.

Introduction:

The incorporation of Artificial Intelligence (AI) into business education and entrepreneurial practice marks the beginning of a new era with vast potential for profound change. This integration is expected to reshape conventional paradigms and stimulate innovation in several sectors. With the rapid progress of technology, educators, academics, and practitioners are increasingly relying on AI-driven solutions to improve learning outcomes, stimulate creativity, and develop entrepreneurial attitudes in future business leaders. This paper aims to examine the diverse role of artificial intelligence (AI) in promoting creativity and innovation in the fields of



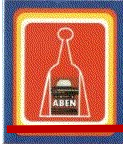
business education and entrepreneurship. It will analyse existing research, best practices, and emerging trends to offer insights that can guide future educational strategies, business models, and policy frameworks in the age of AI-driven entrepreneurship.

The use of AI technology in business education has the capacity to entirely revolutionise teaching techniques by transcending the limitations of conventional instructional methodologies. Learners are able to enjoy personalised, captivating, and flexible learning experiences (Clark et al., 2020; Yang & Cornelius, 2021). By employing AI-driven tools such as intelligent tutoring systems, natural language processing, and machine learning algorithms, educators can offer students opportunities to explore complex business scenarios, experiment with different strategies, and receive personalised feedback tailored to their individual needs and learning preferences (Lee & Wu, 2019; Zhou et al., 2020). These activities not only increase student involvement and memory retention but also foster analytical thinking, problem-solving aptitude, and a profound comprehension of current business obstacles (Li & Sun, 2018; Cheng & Lu, 2021). Moreover, AI has significant potential to cultivate an entrepreneurial attitude and augment the proficiencies of business students. It equips individuals with the essential information, skills, and tools to successfully traverse the uncertainties and complexity of the modern corporate environment (Zhao & Chen, 2020; Mitra & Gupta, 2019). AI-driven platforms that use advanced algorithms enable prospective entrepreneurs to effectively find profitable prospects, minimise risks, and enhance decision-making processes in areas like as ideation, market analysis, and predictive modelling (Shi et al., 2021; Rasmussen & Saeed, 2020). By integrating students into AI-driven entrepreneurial ecosystems, educational institutions may cultivate an environment that promotes innovation and encourages taking risks, hence stimulating the development of scalable businesses with the potential for sustained growth (Bouncken et al., 2021; Zeng et al., 2018).

However, the integration of AI into business education and entrepreneurial practice poses some challenges and ethical considerations. The increasing significance of AI algorithms in decision-making processes has generated apprehensions about bias, transparency, and algorithmic responsibility (Mittelstadt et al., 2016; Zhang et al., 2020). Moreover, the rapid pace of technology advancement necessitates ongoing professional development for educators and practitioners to ensure effective utilisation of AI technologies and ethical management of data (Kulkarni & Saini, 2020; Vosburg et al., 2021).

The introduction of AI in business education and entrepreneurship has initiated collaborations across several disciplines and partnerships across different sectors, with the goal of fully utilising the potential of AI-driven innovation. Partnerships among academia, business, and government have resulted in the creation of AI-driven learning ecosystems, incubators, and accelerators that promote cooperation, the sharing of information, and the transfer of technology (Bouncken et al., 2021; Zhao & Chen, 2020). These efforts assist students in acquiring practical experience, interacting with industry professionals, and using advanced technology. This, in turn, improves their chances of finding employment and enhances their potential to start their own businesses (Mitra & Gupta, 2019; Rasmussen & Saeed, 2020).

The accessibility of AI tools and resources has enabled educators and entrepreneurs from many backgrounds to use AI in creative ways, making knowledge and possibilities more accessible to a wider range of people (Shi et al., 2021; Zeng et al., 2018). Open-source AI platforms, online courses, and community-driven initiatives empower aspiring entrepreneurs by equipping them with the necessary tools and resources to create AI-driven solutions for urgent societal problems. This process democratises innovation and promotes inclusive economic growth (Zhou et al., 2020; Zhang et al., 2020).



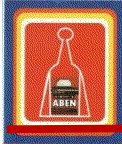
However, it is essential to recognise and deliberate upon the ethical, social, and economic ramifications of using AI in the realms of business education and entrepreneurship. As AI technology becomes more integrated into our everyday lives, there are notable worries around data privacy, algorithmic bias, and the possibility for employment displacement (Mittelstadt et al., 2016; Kulkarni & Saini, 2020). In order to guarantee that AI-driven innovation helps society and minimises possible damage, it is crucial to have ethical frameworks, regulatory procedures, and responsible AI practices in place. These measures also help to build confidence in AI systems (Vosburg et al., 2021; Zhang et al., 2020).

AI may enhance critical thinking and problem-solving abilities by providing tailored learning experiences. According to Johnson and Estrada (2020), AI-driven educational systems has the potential to adjust to individuals' unique learning styles and preferences. Through the use of algorithms that examine students' interactions and performance data, these platforms have the capability to tailor learning materials and activities to match the unique needs of each learner. This tailored method guarantees that students are adequately stimulated, therefore fostering their ability to analyse and innovate as they engage with personalised instructional material.

AI-powered interactive educational tools are essential for giving students practical problem-solving experiences. Li and Zhang (2019) state that AI-based simulations and virtual environments provide students with a risk-free setting to apply theoretical knowledge to real-world settings. Through the use of interactive simulations, students have the opportunity to explore several solutions, get instant feedback on their choices, and continuously improve their problem-solving approaches. This repeated approach not only improves their capacity to think critically but also fosters resilience and flexibility when confronted with intricate obstacles. Artificial intelligence enables instructors to get profound understanding of students' learning processes via advanced data analysis approaches. According to Wang et al. (2021), AI algorithms have the capability to analyse extensive educational data, which includes measures of students' achievement, their learning behaviours, and cognitive processes. Through the analysis of significant patterns and connections in this data, instructors may pinpoint areas where students may be encountering difficulties or excelling in their critical thinking and problem-solving skills. Equipped with this understanding, teachers may customise their teaching methods to target certain learning requirements, skilfully supporting students' progress in these fundamental abilities.

Natural language processing (NLP) technologies provide an alternative method for artificial intelligence (AI) to enhance its capacity for critical thinking and problem-solving. By using chatbots and virtual assistants powered by Natural Language Processing (NLP), students may engage in dialogue-based learning experiences that promote active inquiry and reflection. According to the findings of Smith and Jones (2020), engaging in conversations with AI-powered tutors helps students to express their opinions, challenge assumptions, and provide justifications for their thinking. These discussions allow students to enhance their comprehension of intricate subjects while also refining their skills in analysing material critically and expressing their thoughts effectively.

Moreover, AI-facilitated collaborative learning settings enhance students' cooperation, communication, and collective problem-solving abilities. Through the use of artificial intelligence, students acquire the ability to successfully cooperate with peers from various backgrounds and viewpoints throughout group interactions and project-based tasks. According to Chen et al. (2018), collaborative problem-solving assignments motivate students to use their combined knowledge and talents to address intricate issues together. During this cooperative process, students develop crucial interpersonal skills, including attentive listening, negotiation, and conflict resolution, which are vital for successful problem-solving in professional environments. AI-



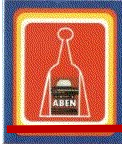
powered collaboration platforms are crucial in fostering collaborative creativity among male and female students. Chen et al. (2018) found that using AI technology to promote collaborative problem-solving activities motivates students to collaborate and come up with creative solutions for real-world problems. Through the use of AI-driven communication tools and project management systems, both male and female students may efficiently cooperate on entrepreneurial endeavours, exchange ideas, and jointly develop solutions, irrespective of their physical location or availability. This cooperative method not only amplifies ingenuity but also cultivates collaboration and mutual esteem among students from all backgrounds.

AI can promote creativity and innovation in male and female students by providing personalised learning experiences. According to Johnson and Estrada (2020), AI-powered educational platforms can adapt learning materials and activities to meet the specific needs and preferences of individual learners. By using algorithms that assess students' learning styles, interests, and performance data, these platforms may provide customised suggestions and adaptable learning paths that promote creativity and innovation. Artificial intelligence may aid students in formulating and verifying novel business concepts. Li and Zhang (2019) emphasise the significance of artificial intelligence (AI) in examining market trends, consumer behaviour, and competitive environments to discover entrepreneurial prospects and evaluate their feasibility. Through the use of AI-driven predictive analytics and natural language processing algorithms, both male and female students may get vital knowledge on prospective market voids, customer requirements, and developing patterns. This knowledge empowers them to create creative company ideas with significant development prospects.

Furthermore, AI has the potential to encourage ethical and inclusive entrepreneurial practices, while also nurturing creativity and innovation. Smith and Jones (2020) highlight the significance of integrating concepts of diversity, equality, and inclusion into AI algorithms and decision-making processes. In order to foster a learning environment that is inclusive and appreciates many perspectives, educators may guarantee that AI technologies are developed and used in a manner that promotes equal opportunities for both male and female students. This inclusive strategy not only enhances the educational experience but also cultivates a climate of creativity that accepts variety and acknowledges individual contributions.

In the ever-evolving realm of entrepreneurship and business education, it is essential to cultivate critical thinking and problem-solving skills to equip students with the necessary abilities to address complex challenges and seize opportunities in the dynamic corporate environment. Artificial intelligence (AI) offers innovative techniques to enhance the skills of both senior and junior students. It achieves this through personalised learning experiences, interactive simulations, data-driven analysis, adaptive assessments, natural language processing (NLP) tools, and collaborative learning platforms. This article explores the capacity of artificial intelligence (AI) to improve critical thinking and problem-solving abilities in entrepreneurship and business education for students across different academic levels.

Artificial intelligence has the potential to enhance critical thinking and problem-solving skills by offering tailored learning experiences. AI-driven educational platforms use sophisticated algorithms to analyse students' performance data and learning behaviours, enabling personalised learning experiences that respond to the specific requirements and skills of both older and younger pupils (Johnson & Estrada, 2020). AI guarantees that both senior and junior students are suitably challenged by tailoring learning materials and activities to align with their learning styles and proficiency levels. This promotes deeper engagement and skill development in critical thinking and problem-solving. AI-powered interactive simulations and case studies provide students immersive learning experiences that replicate real-world business settings. Li and Zhang



(2019) state that AI-powered simulations allow students to use theoretical knowledge in actual situations, make strategic choices, and resolve intricate issues in a safe setting. These interactive experiences enhance students' comprehension of fundamental topics and promote critical thinking and problem-solving abilities by motivating them to investigate various approaches and predict potential consequences.

Artificial intelligence enables students to use data analysis and insights to inform and direct their decision-making processes. Artificial intelligence algorithms can analyse large amounts of data to identify and understand patterns, trends, and opportunities that are relevant to entrepreneurship and business education. Senior students have the ability to use AI-powered data analytics tools for the purposes of doing market research, carrying out competitive analysis, and formulating business plans based on data (Wang et al., 2021). Similarly, AI-generated insights may be used by younger pupils to develop critical thinking abilities and problem-solving tactics rooted on evidence and analysis. Artificial intelligence enables the implementation of adaptive evaluations and feedback systems that enhance students' learning and promote the growth of their skills. AI-driven evaluations adapt the degree of difficulty depending on students' performance, guaranteeing that both advanced and beginner students are appropriately challenged (Chen et al., 2018). In addition, AI algorithms provide immediate feedback on students' answers, pinpointing their strengths and areas for development in their analytical reasoning and problem-solving methods. This prompt feedback not only directs students' learning but also fosters metacognitive abilities and self-reflection.

Ultimately, the incorporation of artificial intelligence into business education and entrepreneurial practice signifies a fundamental change in thinking that has significant consequences for education, industry, and society as a whole. By using artificial intelligence to cultivate creativity, innovation, and entrepreneurial mindset, we can design a future in which human capacity is fully realised, and social issues are tackled via collaborative, technology-based resolutions. By engaging in multidisciplinary cooperation, practicing responsible innovation, and upholding ethical AI principles, we may effectively use the revolutionary capabilities of AI to create a future that is fair, environmentally conscious, and economically successful for everyone.

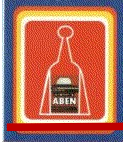
This article analysed the correlation between artificial intelligence (AI), creativity, and innovation in the realms of business education and entrepreneurial activity. Through a thorough analysis of up-to-date research, established methods, and developing patterns, our objective is to offer valuable knowledge that will guide future educational approaches, business structures, and policy frameworks in the age of AI-powered entrepreneurship. Ultimately, our aim is to shape a future where AI acts as a driving force for human creativity, innovation, and entrepreneurial achievement.

Statement of the Problem:

The UK Association of Graduate Recruiters (2007) has found a deficiency in the skills of university graduates. Moses (2015) reported that a study conducted by the National Universities Commission (NUC) revealed that Nigerian university graduates were deficient in fundamental work skills such as creativity, innovation, and critical thinking. Platstrik, Seitzer, and Taylor (2008) observed that if educational performance is not improved, the gap between the skill demands of firms and the capabilities of graduates would continue to grow.

Therefore, incorporating artificial intelligence (AI) into business education and entrepreneurship practice has the potential to greatly enhance creativity, innovation, and the entrepreneurial attitude of students and practitioners.

It is essential to identify and evaluate the most effective Artificial Intelligence (AI) strategies and technologies for enhancing creativity and innovation in the curriculum of business schools.



Gaining a comprehensive understanding of how artificial intelligence (AI) may be smoothly incorporated into educational settings to improve student engagement, foster critical thinking skills, and boost problem-solving abilities is crucial for maximising learning outcomes and equipping future business leaders with the necessary capabilities to tackle the demands of the digital era.

It is necessary to investigate how firms use AI technology to enhance creativity and innovation in their entrepreneurial activities. It is essential to comprehend the critical aspects that lead to success, the obstacles faced, and the consequences of using AI in entrepreneurial endeavours. This knowledge is vital for making informed strategic decisions, allocating resources effectively, and developing policies in the quickly changing field of entrepreneurship.

The democratisation of AI technologies and resources presents advantageous prospects for students, educators, businesses, and policymakers. It is crucial to prioritise fair access to AI education and resources, as well as to encourage diversity and inclusion in AI-driven innovation ecosystems. Additionally, it is important to address and minimise potential risks and disparities in order to fully leverage the creative and innovative potential of AI in business education and entrepreneurship practice. By using these tools, we can unleash the revolutionary capabilities of artificial intelligence to stimulate creativity, foster innovation, and achieve entrepreneurial triumph in the 21st century.

Purpose of the Study:

The main aim of this study is to investigate the influence of artificial intelligence (AI) on fostering creativity and innovation in the domains of business education and entrepreneurial practice. More precisely, the research investigates;

1. The application of AI technologies that enhance creativity and innovation among students in entrepreneurship and business education programmes.
2. The application of AI technologies that enhance critical thinking and problem solving skills among students in entrepreneurship and business education programmes.

The following research questions guided the study.

1. How does the application of Artificial Intelligence (AI) tools and techniques enhance creativity and innovation among students in entrepreneurship and business education programme?
2. How does the application of Artificial Intelligence (AI) tools and techniques enhance critical thinking and problem solving skills among students in entrepreneurship and business education programmes?

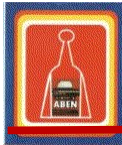
The following hypotheses was formulated and tested at 0.05 level of significance.

Ho₁: There is no significant difference in the mean responses of male and female students in the application of artificial intelligence tools and techniques in enhancing creativity and innovation in entrepreneurship and business education programme.

Ho₂: There is no significant difference in the mean responses of senior and junior students in the application of artificial intelligence tools and techniques in enhancing critical thinking and problem solving skills in entrepreneurship and business education programme.

Method

The study used a descriptive survey methodology. The study was conducted at three tertiary institutions in Bayelsa State (Niger Delta University, Wilberforce Island, Federal University Otuoke and Isaac Jasper Boro College of Education Sagbama) that provide business education programs. The research population included 649 students pursuing business education across the three institutions. The sample size of 194 business education students was selected using the



approach of simple random selection. This specific sample constituted 30% of the whole population. The data collection instrument used was a validated questionnaire with a 4-point Likert scale, encompassing choices for strongly agree (SA), agree (A), disagree (DA), and severely disagree (SD). The instrument's reliability was evaluated by a pilot test, and the collected data was examined using Cronbach alpha, yielding an internal consistency score of 0.863. Of the 194 questionnaires provided to the participants by the researcher and three research assistants, 187 questionnaires (96.4% of the total) were completed correctly and used for data analysis. The data was examined using the mean and standard deviation to answer the study objectives. In addition, the t-test statistic was used to evaluate the hypotheses with a significance threshold of 0.05.

The selection of each individual questionnaire item was determined by the specific numerical limitations. Individuals with a mean score of 2.5 or above showed improvement, whereas those with a mean score lower than 2.5 did not show improvement. The null hypotheses will be accepted if the computed t-value is less than the critical t-value, and will be rejected if the calculated t-value is equal to or greater than the critical t-value.

Results

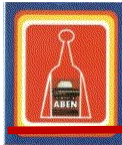
Research Question One

How do the application of Artificial Intelligence (AI) tools and techniques enhance creativity and innovation among students in entrepreneurship and business education programme?

The data for answering research question one are presented in table 1 below.

Table 1: Mean ratings of the respondents on how the application of Artificial Intelligence tools and techniques enhance creativity and innovation in Entrepreneurship and Business Education (n = 187)

SN	How the application of AI tools and techniques enhance creativity and innovation among students in entrepreneurship & Business education	$\bar{X}$	SD	Rmk
1	AI-powered teaching systems foster students' ability to think innovatively when faced with business dilemmas.	3.65	0.64	A
2	AI-driven simulations and case studies provide practical insights that foster creative thinking among students.	3.64	0.50	A
3	AI-powered personalised learning experiences enable students to fully realise their creative potential in the fields of entrepreneurship and business education.	3.44	0.45	A
4	Artificial intelligence algorithms that analyse market data and trends play a role in the creation of novel business concepts by students.	3.46	0.52	A
5	AI-powered feedback mechanisms provide useful insights that motivate students to create and enhance their business ideas.	3.58	0.48	A
6	Artificial intelligence (AI)-enabled collaboration tools enhance cooperation and the sharing of ideas, promoting a culture of creativity in entrepreneurship education.	3.59	0.52	A
7	AI-augmented problem-solving tasks motivate students to engage in critical and innovative thinking around company prospects and challenges.	3.76	0.49	A
8	Artificial intelligence-powered natural language processing technologies enhance communication and information exchange, resulting in inventive solutions in the field of business education.	3.48	0.50	A
9	AI technologies provide students a wide array of resources and views, stimulating creative and forward-thinking in the field of entrepreneurship.	3.32	0.44	A
10	AI-driven analytics assist students in recognising new industry trends and identifying chances for innovation in commercial initiatives.	3.50	0.47	A



11	Artificial intelligence-powered technologies aid students in creating and improving creative business concepts.	3.46	0.51	A
12	AI-powered learning environments promote experimentation and inspire individuals to take risks, hence cultivating an innovative culture in entrepreneurship education.	3.60	0.55	A
13	The use of AI algorithms to analyse user interactions and feedback plays a significant role in the ongoing enhancement of entrepreneurship education programs.	3.43	0.68	A
14	AI-driven recommendation systems provide pertinent educational materials and tools that motivate students to delve into novel ideas and concepts.	3.54	0.48	A
15	AI-powered evaluation tools efficiently measure students' capacity for creative thinking and problem-solving in entrepreneurship and business education.	3.57	0.47	A
Grand Mean		3.53	0.61	A

Key: $\bar{X}$ = Mean, SD = Standard Deviation, A = Agreed; n = number of respondents.

The mean ratings of the respondents' responses on the 15 items included in Table 1 ranged from 3.32 to 3.76, all of which surpassed the benchmark value of 2.50 on a 4-point rating scale. The table comprises 15 prominently identified factors that have been mutually acknowledged by the participants as mechanisms via which the use of Artificial Intelligence (AI) technology and methodologies might enhance creativity and innovation among students in entrepreneurship and business education programs. The standard deviation values of the 15 items in the table ranged from 0.44 to 0.68, indicating that the responses of the participants were comparable to both the average and to each other.

Hypothesis One

There is no significant difference in the mean responses of male and female students in the application of artificial intelligence tools and techniques in enhancing creativity and innovation in entrepreneurship and business education programme.

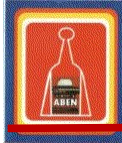
The data for testing hypothesis one are presented in table 2 below.

Table 2: Test of no significant difference in the mean ratings of male and female students in the application of artificial intelligence tools and techniques in enhancing creativity and innovation in Entrepreneurship and Business education programme.

Variables	N	$\bar{X}$	SD	DF	Std. Error	t- Cal	t- Critical	Level of Sig.	Rmks
Male Students	84	3.56	0.62	185	0.033	1.82	1.96	0.05	NS
Female Students	103	3.50	0.71						

Note: NS = NotSignificant at 0.05.

The t-test findings in Table 2 show that the calculated t-value (t-cal) of 1.82 is less than the critical t-value (t-tab) of 1.96 at 185 degrees of freedom. This finding indicates that there is no statistically significant disparity ($p < 0.05$) in the mean ratings of male and female students' responses concerning the utilisation of artificial intelligence tools and techniques to augment creativity and innovation in entrepreneurship and business education programs. Hypothesis one supports the null hypothesis, indicating that there is no statistically significant ($p < 0.05$) disparity in the average ratings of the responses between male and female students.



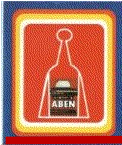
Research Question Two

How do the application of Artificial Intelligence (AI) tools and techniques enhance critical thinking and problem solving skills among students in entrepreneurship and business education programmes?

The data for answering research question two are presented in table 3 below.

Table 3: Mean ratings of the respondents on how the application of Artificial Intelligence tools and techniques enhance critical thinking and problem solving skills among students in Entrepreneurship and Business education (n = 187)

SN	How the application of AI tools to enhance critical thinking and problem solving skills among students in entrepreneurship & Business education programme	$\bar{X}$	SD	Rmk
1	AI-driven teaching platforms stimulate students to engage in critical thinking around business challenges and potential prospects.	3.55	0.68	A
2	Artificial intelligence-powered simulations and case studies provide authentic situations that stimulate students to analyse, assess, and resolve intricate business dilemmas.	3.64	0.47	A
3	AI technologies provide personalised learning experiences that foster students' ability to approach problem-solving assignments with innovation.	3.26	0.55	A
4	Artificial intelligence algorithms analyse data and trends to assist students in cultivating analytical thinking abilities essential for proficient problem-solving in the fields of entrepreneurship and business.	3.67	0.50	A
5	AI-powered feedback systems provide students practical insights that help them reflect on and improve their problem-solving strategies.	3.69	0.46	A
6	AI-driven collaborative tools facilitate students' collaboration in generating solutions, promoting cooperation and collective problem-solving abilities.	3.40	0.45	A
7	AI-augmented problem-solving tasks compel students to scrutinise business issues from several angles and devise inventive resolutions.	3.65	0.49	A
8	Artificial intelligence-powered natural language processing technologies improve communication and the exchange of ideas, hence boosting students' capacity to explain and defend their problem-solving solutions.	3.73	0.43	A
9	AI technologies provide students the ability to access a wide range of information and viewpoints, enabling them to approach problem-solving challenges with creativity.	3.68	0.70	A
10	Artificial intelligence (AI) driven analytics assist students in recognising patterns and trends within data, enabling them to make well-informed choices and resolve intricate business issues.	3.52	0.62	A
11	Artificial intelligence-powered tools for supporting creativity aid students in producing and assessing novel solutions to business problems.	3.56	0.54	A
12	AI-powered learning environments cultivate a climate of curiosity and exploration, encouraging students to develop flexible problem-solving abilities.	3.44	0.49	A
13	Artificial intelligence algorithms that analyse user interactions and feedback play a significant role in enhancing problem-solving tactics in entrepreneurship education programs.	3.47	0.50	A
14	Recommendation systems powered by artificial intelligence suggest problem-solving methodologies and techniques that are relevant, assisting students in approaching business challenges in a systematic manner. Assessment tools driven by AI effectively evaluate students' critical thinking and problem-solving abilities, offering valuable feedback to enhance their skills.	3.56	0.49	A
15	AI-driven teaching platforms stimulate students to engage in critical	3.62	0.52	A



thinking around business challenges and potential prospects.
Grand Mean

3.56 0.49 A

Key: $\bar{X}$ = Mean, SD = Standard Deviation, **A** = Agreed; n = number of respondents.

The mean ratings of the respondents' responses on the 15 items in Table 3 ranged from 3.26 to 3.73, all of which exceeded the reference value of 2.50 on a 4-point rating scale. The table presents a list of 15 themes that respondents have identified as ways in which the use of Artificial Intelligence (AI) technology and techniques enhance critical thinking and problem-solving skills among students in entrepreneurship and business school programs. The standard deviation values of the 15 items in the table ranged from 0.43 to 0.70, indicating that the responses of the participants are both close to the average and to each other.

Hypothesis Two

There is no significant difference in the mean responses of senior and junior students in the application of artificial intelligence tools and techniques in enhancing critical thinking and problem solving skills among students in entrepreneurship and business education programme.

The data for testing hypothesis two are shown in table 4.

Table 4: Test of no significant difference in the mean ratings of Senior and Junior students in the application of artificial intelligence tools in enhancing critical thinking and problem solving skills in Entrepreneurship and Business Education programme.

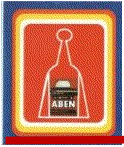
Variables	N	$\bar{X}$	SD	DF	Std. Error	t- Cal	t- Critical	Level of Sig.	Rmks
Senior Students	90	3.68	0.50	185	0.021	11.43	1.96	0.05	S*
Junior Students	97	3.44	0.76						

Note: **S*** = Significant at 0.05.

The results from the t-test in Table 4 shows that the calculated t-value (t-cal) of 11.43 is greater than the crucial t-value (t-tab) of 1.96 at 185 degrees of freedom. The data suggests a significant disparity ($p < 0.05$) in the mean ratings between Senior and Junior students. Senior students exhibit a stronger inclination towards utilising artificial intelligence tools and techniques to enhance critical thinking and problem-solving abilities in entrepreneurship and business education programs. Thus, hypothesis two rejects the null hypothesis that there is no statistically significant difference ($p < 0.05$) in the average ratings of the answers between Senior and Junior students.

Discussion of Findings

This research investigated the capacity of using Artificial Intelligence (AI) technologies and approaches to augment creativity and innovation among students. The findings suggest that AI-driven educational platforms can encourage students to think creatively and stimulate innovative thinking. These platforms provide practical insights and help students explore their creative potential. Additionally, they contribute to the generation of innovative business ideas and offer valuable insights that inspire students to innovate and refine their business concepts. Furthermore, AI platforms facilitate teamwork and idea exchange, fostering a culture of innovation in entrepreneurship education. Lastly, they challenge students to think critically and creatively

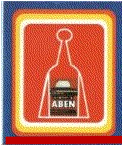


about business opportunities and obstacles. In line with the findings of this research, Marrone et al. (2022) found that students who had a higher level of understanding of artificial intelligence (AI) had more positive views about integrating AI into their courses. The students exhibited a thorough grasp of how artificial intelligence may promote creativity and enable the creation of novel ideas via instructional techniques. Cropley and Marrone (2021) shown that instruction in artificial intelligence using convolutional neural networks may significantly augment learners' inventiveness. Beaty and Johnson (2021) and Olson et al. (2021) have shown that incorporating artificial intelligence into education improves students' ability to provide creative ideas for a traditional alternative uses exercise. Furthermore, this study's findings support the conclusions of Belpaeme et al. (2018), who showed that current research suggests that artificial intelligence has the potential to improve skills often associated with creativity, such as curiosity, resolve, persistence, and focus, in students. Furthermore, the results of this research support the findings of Ryu and Han (2018), who examined the opinions of Korean school teachers about artificial intelligence in education. They found that instructors who had leadership experience acknowledged that AI may enhance students' creativity.

Artificial intelligence tools and techniques can enhance students' critical thinking and problem-solving skills in the following ways: by prompting students to think critically about business problems and opportunities, presenting realistic scenarios that require analysis, evaluation, and solution of complex business challenges, providing actionable insights that help students reflect on and improve their problem-solving approaches, facilitating collaborative brainstorming sessions to foster teamwork and collective problem-solving skills, encouraging students to analyse business problems from various perspectives and generate innovative solutions, and granting students access to diverse resources and perspectives, empowering them to approach problem-solving tasks creatively. According to the results of this study, Tubb, et al (2020) discovered that contemporary education supports teaching methods that focus on problem-solving. These approaches emphasise the cultivation of children's creative cognitive abilities, which may be augmented by the integration of artificial intelligence in educational practices. Marrone, et al (2022) argue that the main goal of artificial intelligence in education is to promote and enable the growth of abilities such as problem-solving, collaborative creativity, and critical thinking, rather than solely concentrating on the acquisition of specific knowledge in a particular field. Moreover, the results of this research confirmed the conclusions of the International Society for Technology Education (2024) that artificial intelligence has a wide-ranging beneficial impact on pupils. This includes tailored instruction, improved abilities in critical thinking and problem-solving, and better readiness for the changing requirements of the digital era. As a result, it contributes to a more dynamic and adaptable educational experience. Consistent with the results of this study, Robert, Potter, and Frank (2024) asserted that incorporating artificial intelligence into education has the capacity to transform the learning process for students by enhancing critical thinking, fostering the creation of innovative ideas, and developing problem-solving abilities.

Conclusion

The study examined the use of Artificial Intelligence in promoting creativity and innovation in the domains of Business Education and Entrepreneurship. The study aimed to examine the potential impact of utilising Artificial Intelligence (AI) tools and techniques on enhancing the cultivation of creativity, innovation, critical thinking, and problem-solving skills in students enrolled in Business Education and Entrepreneurship programs at tertiary institutions in Bayelsa State. Data was collected from the participants and analysed. The research found that incorporating Artificial Intelligence tools and approaches into training can greatly improve the creativity,



originality, critical thinking, and problem-solving abilities of students in Business Education and Entrepreneurship programs.

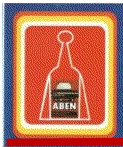
Recommendations

The study's recommendations are based on its findings and conclusion.

- i. Implementation of Artificial Intelligence aided instructions in Nigerian tertiary institutions to facilitate the successful execution of Business Education and Entrepreneurship programs, among other initiatives, represents a paradigm change.
- ii. Ensuring the supply of sufficient equipment and facilities that would support the implementation of Artificial Intelligence aided teachings in Nigerian schools.
- iii. Enhancing the training and retraining of Nigerian educators in the proficient use of Artificial Intelligence to facilitate the instruction and learning process for students in Business Education and Entrepreneurship programs, among other subjects.
- iv. The implementation of Artificial Intelligence centres in every tertiary institution in Nigeria, including Bayelsa State, to enhance the integration and utilisation of Artificial Intelligence in teaching and learning processes.

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