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ARTIFICIAL INTELLIGENCE AND STRESS REDUCTION AMONG ACCOUNTING EDUCATION STUDENTS IN TERTIARY INSTITUTIONS IN AKWA IBOM STATE

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Abstract

The study examined Artificial Intelligence and Stress Reduction among Accounting Education students in Tertiary Institutions in Akwa Ibom State. It adopted a survey research design to investigate the magnitude of Stress Reduction (SR) and Artificial Intelligence (AI), and Academic performance (AP) and Artificial intelligence (AI) among accounting education students in tertiary institutions. A structured questionnaire in English was designed by the researchers and used as a relevant instrument for primary data collection using a 4-point ranking scale of Strongly Agree (SA) 4; Agree (A) 3; Disagree (D) 2; Strongly Disagree (SD) 1. A two-stage cluster sampling was used, where a simple random sample of clusters is selected and then a simple random sample is selected from the units in each sampled cluster. The sampling technique used in the first stage of the sampling was a Taro Yamane formula, which was used to determine the reliable sample size from population size of 700. Two hundred and fifty-five (255) Questionnaires were distributed and Two hundred and forty-one (241) were retrieved, a 95% retrieval. The model specification used for these analyses was Regression and Correlation. The mechanism used for this research was trustworthy, the researchers through their expertise ensured that the instrument measured what it was actually constructed to measure in the course of the study. Every item in the instrument was critically securitized and screened. Two hypotheses were tested: there is no significant effect of Artificial Intelligence on Stress Reduction among Accounting Education students of Tertiary Institutions in Akwa Ibom State; and there is no significant effect of Artificial Intelligence on Academic Performance among Accounting Education students in Tertiary Institutions in Akwa Ibom State. From the findings of the analyses, it is concluded that Artificial Intelligence (AI) has a positive effect on Stress Reduction (SR) and Academic Performance (AP).

INTRODUCTION

The history of Artificial Intelligence is marked by periods of rapid advancement, challenges, and resurgence. Artificial Intelligence has evolved through the contributions of many researchers and the application of various scientific disciplines. As Artificial Intelligence continues to advance, its impact on various aspects of life will grow, bringing both opportunities and challenges that will need

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to be carefully managed (Dong et al., 2020; Limna, 2022). Artificial Intelligence refers to the development of computer systems capable of performing tasks that typically require human intelligence. These tasks include problem-solving, learning, reasoning, perception, language understanding, and decision-making (Chen et al., 2022). Artificial Intelligence systems can be categorized into various types based on their complexity and functionality:

i. **Narrow Artificial Intelligence (Weak Artificial Intelligence):** Designed to perform a specific task or a narrow range of tasks. Examples include virtual assistants like Siri and Alexa, recommendation algorithms, and facial recognition systems.
ii. **General Artificial Intelligence (Strong Artificial Intelligence):** A more advanced form of AI that can understand, learn, and apply knowledge across a wide range of tasks, mimicking human cognitive abilities. General Artificial Intelligence remains largely theoretical at this stage.
iii. **Super-Intelligent Artificial Intelligence:** Hypothetical Artificial Intelligence that surpasses human intelligence across all fields, including creativity, decision-making, and emotional intelligence. This concept is largely speculative and the subject of ethical and philosophical debate. (Rahmatullah et al., 2022).

Artificial intelligence is the ability of a computer program to learn and think. Everything that involves a program doing something that people would typically think would require the intelligence of a human is considered artificial intelligence (Mitchell, 2019). Furthermore, artificial intelligence is the simulation of human intelligence operations by computers, specifically computer systems. Artificial Intelligence excels at specific tasks and changes almost every sector of a country's economy by allowing computers to make sound decisions that lead to more efficient operations (Dong et al., 2020; Limna, 2022). Artificial Intelligence has been applied in many practical fields. In addition, intelligent computers are transforming society as computers and robots become more intelligent. Artificial Intelligence is now present in almost every aspect of people's daily life (Li et al., 2018). Artificial Intelligence also allows people to work smarter, which leads to better business outcomes. Still, it also necessitates the development of new competencies and capabilities, ranging from technological expertise to social and emotional skills, as well as creative abilities (Limna, 2022). The benefits of AI are enormous, and it has the potential to revolutionize any professional sector (Makridakis, 2017). Hence, the adoption of artificial intelligence is regarded as critical in industry 4.0. Since its inception, it has brought numerous opportunities and challenges to various sectors. Many Artificial Intelligence-powered technologies have been developed with the potential to significantly improve the economy by improving the quality of life in many sectors (Limna et al., 2021).

Stress is the reaction of a human body marked by great anxiety or duress when faced with a challenging condition. The clinical definition of stress can be a psycho-physiological state of extreme discomfort and distress for an individual that can get extrapolated to acute mental health problems like depression or anxiety attacks (Pandiaraj et al., 2022)

A stressor is an event or condition present in or around an individual which may tend to trigger stress. The impact of stress on an individual can be positive and negative (also called as good and bad respectively) depending on the way stressful situations are handled. This means that whereas a situation can be extremely stressful for one individual it may happen to be just a mild reaction for another. Moreover, a prior stressful experience provides a defensive mechanism in repeated conditions. For people who like to lead a life full of challenges, stress acts as an adrenalin booster. Hence, Pandiaraj et al (2022) consider stress as an affirmative reaction.

Stress which has a positive impact is called Eustress. It is a type of stress an individual feels when some stimulating incident is expected to happen in their surrounding environment. It is marked by an increase in pulse rate but without any underlying feeling of threat or fear. This stress is mostly felt by people when the outcomes of the situation are expected to be positive as like when competing for a promotion or during childbirth. Eustress can reinforce people's mental ability to meet daily challenges and motivate them to achieve their goals and complete tasks more efficiently. Eustress

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pushes people to come out of their comfort zone which in turn inspires them to learn, grow and become stronger. Stress which has a negative impact called distress is marked by anxiety or a high level of concern. It can be a short-term or long-term occurrence. The effects of distress can be manifested as a decrease in performance and a lack of mental clarity. Chronic or major diseases can also cause distress which may prove extremely difficult for the human brain and the body to handle, possibly even leading to depression and other mental and physical health issues.

External environments like work and internal stimulations like feelings and habitual behavior can also cause distress. Some common sources of distress include fear, worrying about future events, recurring negative thoughts, unrealistic and perfectionist expectations, over-scheduling, improper future planning, excessive job demands, job insecurity, failing to be assertive, etc. Some personal stressors can also cause bad stress like the death of a family member, illness or injury, money problems, unemployment, sleep problems, legal problems, etc. Hence it is important to detect duress as early as possible as it can have a serious impact on people's lives.

Stress is a widespread condition that impacts people of all ages and socioeconomic backgrounds. Although it is a natural response to challenging situations, chronic or frequent stress can have detrimental effects on physical and mental health. As a result, there is a growing need for effective stress detection and management systems.

According to Asuquo and Ukoima (2016) recent advancements in IoT, machine learning, and Artificial Intelligence have opened up new possibilities for stress detection and management, allowing for real-time monitoring of stress levels. Artificial Intelligence contains various subsections with Machine Learning, Conventional Neural Networks, Deep Learning, speech recognition with unique skills and functionalities. The rapid advancement and integration of Artificial Intelligence in education have given rise to Artificial Intelligence-driven personalized learning platforms, promising tailored educational experiences for individual learners. While there is growing enthusiasm about the potential of Artificial Intelligence-driven personalization to transform education and stress reduction among accounting education students, there remains a need for empirical evidence and rigorous research to understand the actual impact of these technology on stress reduction among accounting education students and its overall performance (Roll et al., 2016).

This conducted study aims to address the following questions:

1. To what extent does Artificial Intelligence help in the reduction of stress among accounting education students in tertiary institutions in Akwa Ibom State?
2. How does Artificial Intelligence-driven personalization improve academic performance among accounting education students in tertiary institutions in Akwa Ibom State?

The following hypothesis are formulated for this research

H_0 1: There is no significant effect of Artificial Intelligence on Stress Reduction among accounting education students in tertiary institutions

H_0 2: There is no significant impact of Artificial Intelligence-driven personalization on academic performance among accounting education students in tertiary institutions.

LITERATURE REVIEW

Artificial Intelligence technology has a long history and is constantly changing and growing. It focuses on intelligent agents, devices that perceive their surroundings and take actions to maximize their chances of success (Shabbir and Anwer, 2018). The term "artificial intelligence" conjures up images of supercomputers, which are computers with enormous processing capabilities, including adaptive behaviour, such as the inclusion of sensors and other stuff that allow them to have human-like cognition and functional abilities, and thus improve the supercomputer's interaction with humans (Chen et al., 2020). Artificial intelligence is the ability of a computer program to learn and think. Everything that involves a program doing something that people would typically think would require the intelligence of a human is considered artificial intelligence (Mitchell, 2019). Furthermore, artificial intelligence is the simulation of human intelligence operations by computers, specifically

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computer systems. Artificial Intelligence excels at specific tasks and changes almost every sector of a country's economy by allowing computers to make sound decisions that lead to more efficient operations (Dong et al., 2020; Limna, 2022). Artificial Intelligence has been applied in many practical fields. In addition, intelligent computers are transforming society as computers and robots become more intelligent. Artificial Intelligence is now present in almost every aspect of people's daily life (Li et al., 2018). Artificial Intelligence also allows people to work smarter, which leads to better business outcomes. Still, it also necessitates the development of new competencies and capabilities, ranging from technological expertise to social and emotional skills, as well as creative abilities (Limna, 2022). The benefits of AI are enormous, and it has the potential to revolutionize any professional sector (Alam, 2021). Hence, the adoption of artificial intelligence is regarded as critical in industry 4.0. Since its inception, it has brought numerous opportunities and challenges to various sectors. Many Artificial Intelligence-powered technologies have been developed with the potential to significantly improve the economy by improving the quality of life in many sectors (Limna et al., 2021).

Modern Artificial Intelligence: The Era of Big Data and Deep Learning (2000s-Present)

The resurgence of Artificial Intelligence, driven by advances in machine learning, deep learning, and neural networks, has led to significant breakthroughs. AI is now integrated into numerous applications, from autonomous vehicles and healthcare diagnostics to personalized marketing and financial analysis (Yufeia et al., 2020).

Big Data and Computing Power: The 2000s saw a significant increase in the availability of data (often referred to as "Big Data") and improvements in computing power, which allowed for the training of more complex and effective AI models.

Deep Learning Revolution: Deep learning, a subset of machine learning based on neural networks with many layers, has driven much of the recent progress in AI. Breakthroughs in image and speech recognition, natural language processing, and autonomous systems have been made possible by deep learning algorithms. Notable achievements include:

ImageNet Challenge-2012: The success of deep learning models, particularly AlexNet, in the ImageNet competition demonstrated the power of deep neural networks in visual recognition tasks.

AlphaGo-2016: Developed by DeepMind, AlphaGo defeated Lee Sedol, a world champion Go player. Go was considered a complex game for Artificial Intelligence due to its vast number of possible moves, and AlphaGo's victory was seen as a major milestone in Artificial Intelligence.

Artificial Intelligence in Everyday Life: Artificial Intelligence technologies are now embedded in numerous aspects of daily life, from voice-activated assistants like Siri and Alexa to recommendation systems used by Netflix and Amazon. Autonomous vehicles, Artificial Intelligence-powered diagnostics in healthcare, and advanced robotics are other examples of how Artificial Intelligence is transforming industries (Yufeia et al., 2020).

Significance of Stress in Modern Life

Stress has become an integral and often overwhelming part of modern life, affecting individuals across all age groups, professions, and socio-economic backgrounds. The increasing complexity of daily living, coupled with the demands of work, education, and personal responsibilities, has led to a significant rise in stress levels worldwide. Understanding the significance of stress in modern life requires exploring its causes, effects, and the broader implications for health and well-being (Pranjal et al., 2023).

Stress can be caused by workplace demands (Asha et al., 2021), educational pressure (Hashim 2018), economic uncertainty (Asha et al., 2021), family and social dynamics and Health conditions (WHO, 2021), inadequate knowledge if ICT among others (Hashim, 2018).

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The history of Artificial Intelligence is marked by periods of rapid advancement, challenges, and resurgence. From its early conceptual roots to its current role in shaping the future of technology and society, AI has evolved through the contributions of many researchers and the application of various scientific disciplines. As AI continues to advance, its impact on various aspects of life will grow, bringing both opportunities and challenges that will need to be carefully managed (Yashin et al., 2022).

RESEARCH METHOD

The study adopted a survey research design to investigate the magnitude and direction or nature of the relationship existing between Artificial intelligence (AI) and Stress reduction (SR), and Artificial intelligence (AI) and Academic performance (AP) among accounting education students in tertiary institutions.

A structured questionnaire was designed by the researchers and used as a relevant instrument for primary data collection. A 4-point rating scale of Strongly Agree (SA); Agree (A); Disagree (D); Strongly Disagree (SD). The adopted 4-point ranking scales ranged from SA=4; A= 3; D=2; SD=1. Respondents were to simply tick the scale of their choices based on the questions. The mechanism used for this research was trustworthy, the researchers through their expertise ensured that the instrument measured what it was actually constructed to measure in the course of the study. Every item in the instrument was critically securitized and screened.

A two-stage cluster sampling was used, where a simple random sample of clusters is selected and then a simple random sample is selected from the units in each sampled cluster. It is believed that these categories of respondents in the tertiary institutions are well vested in the knowledge needed to help us ascertain the presence and extent of the relationship between the above stated variables. Taro Yamane formula, which was used to determine the reliable sample size from this population.

Decision Rule

Table 1: Correlation Decision rule

R VALUE	INTERPRETATION
$0 \le \lvert R \rvert < 0.2$	Very weak to negligible correlation
$0.2 \le \lvert R \rvert < 0.4$	Weak correlation
$0.4 \le \lvert R \rvert < 0.7$	Moderate correlation
$0.7 \le \lvert R \rvert < 0.9$	Strong correlation
$0.9 \le \lvert R \rvert \le 1$	Very strong correlation

RESULTS AND DISCUSSION

Research Question One: To what extent does Artificial Intelligence help in the reduction of stress among accounting education students in tertiary institutions?

Hypothesis One: There is no significant effect of Artificial Intelligence on Stress Reduction among accounting education students in tertiary institutions

The Statistical Packages for the Social Sciences (SPSS) and Minitab, and the interpretations are done from the generated data from the two hundred and forty-one (241) respondents

The result showing the Independent Significance of the Regression is below

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Table 2: Regression of Stress Reduction on Artificial Intelligence

Model	R	R-square	p-value	Coefficient
Constant	0.882	0.778		1.23
Artificial Intelligence			0.020	3.14

From the Table 2 above, the correlation coefficient is 0.882, which shows a very strong relationship between the two variables. The R-square value (0.778) shows that Artificial Intelligence has a relationship of about 77.8% with Stress Reduction. The p-value (0.020) shows that the test is significant, the relationship is said to be very strong, as explained by the r-square.

The Regression equation is given as:

$$SR=1.23+\beta_1\ 3.14$$

The equation above means that for every unit increase in the Artificial Intelligence will increase the Stress Reduction by 3.14.

Table 3: Analysis of relationship between Artificial Intelligence (AI) and Stress Reduction (SR) among accounting education students in tertiary institutions

Variables	N	Df	R	r^2	α	Sig	Result
Artificial Intelligence	241						Significant
		239	0.882	0.778	0.05	0.020	(Reject H_0)
Stress Reduction	241						

From the analysis in table 3 above, the sample size (N) for both Artificial Intelligence and **Stress Reduction** is 241. The relationship coefficient calculated, is 0.88 and its square value is 0.78 as stated in the result in the table above. These values show that there is an indication that Artificial Intelligence has a relationship of 0.88 with Stress Reduction. The r^2 value indicates that Artificial Intelligence has a relationship of about 78% with Stress Reduction. The p-value (Sig) is $0.020 < 0.05$ at 239 degrees of freedom. Hence, the Null hypothesis is rejected, indicating that actually there is a significant effect of Artificial Intelligence on Stress Reduction.

Research Question Two: How does Artificial Intelligence-driven personalization improve academic performance among accounting education student in tertiary institution students, Akwa Ibom State?

Hypothesis Two: There is no significant effect of Artificial Intelligence on Academic Performance among accounting education students in tertiary institutions

The Statistical Packages for the Social Sciences (SPSS) and Minitab, and the interpretations are done from the generated data from the two hundred and forty-one (241) respondents

The result showing the Independent Significance of the Regression

Table 4: Regression of Artificial Intelligence on Academic Performance

Model	R	R-square	p-value	Coefficient
Constant	0.873	0.76		2.78
Artificial Intelligence			0.000	2.335

From the table 4 above, the correlation coefficient is 0.873, which shows a very strong relationship between the two variables. The R-square value (0.76) shows that Artificial Intelligence

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has a relationship of about 77.8% with Academic Performance. The p-value (0.000) shows that the test is significant, the relationship is said to be very strong, as explained by the r-square.

The Regression equation is given as:

$$AP=2.78+\beta_1\ 2.335$$

The equation above means that for every unit increase in the Artificial Intelligence will increase the Academic Performance by 2.335.

Table 5: Analysis of relationship between Artificial Intelligence (AI) and Academic Performance **(AP) among Accounting Education students in Tertiary Institutions**

Variables	**N**	**Df**	**R**	**r^2**	α	**Sig**	**Result**
Artificial Intelligence	241						Significant
		239	0.873	0.762	0.05	0.000	(Reject H_0)
Academic Performance	241						

From the analysis in table 5 above, the sample size (N) for both Artificial Intelligence and Academic Performance is 241. The relationship coefficient calculated, is 0.87 and its square value is 0.76 as stated in the result in the table above. These values show that there is an indication that Artificial Intelligence has a relationship of 0.87 with Academic Performance. The r^2 value indicates that Artificial Intelligence has a relationship of about 78% with Academic Performance. The p-value (Sig) is 0.000 < 0.05 at 239 degrees of freedom. Hence, the Null hypothesis is rejected, indicating that actually there is a significant effect of Artificial Intelligence on Academic Performance.

Discussion of Findings

The findings of this study show the relationship existing between the independent and dependent variables.

Hypothesis One was used to find out the relationship between **Stress Reduction** and Artificial Intelligence among accounting education students in tertiary institutions in Akwa Ibom State. The correlation coefficient calculated, is 0.882 and its square value is 0.778. These values show that there is an indication that Artificial Intelligence has a relationship of 0.88 with **Stress Reduction**. The r^2 value indicates that Artificial Intelligence has a relationship of about 77.8% with **Stress Reduction**. The p-value (Sig) is 0.020 < 0.05 at 239 degrees of freedom. Hence, the Null hypothesis is rejected, indicating that actually there is a significant relationship between Artificial Intelligence and **Stress Reduction**. This is in line with the study conducted by Hwang et al., (2020) and Yufeia et al., (2020) who asserted that the adoption of Artificial Intelligence in education has created new opportunities for developing more effective learning activities and better technology-enhanced learning applications or environments. There are several essential aspects of AI technology in education, such as teacher feedback, automatic grading system, adaptive learning, distance learning, and so on. The relationship between Artificial Intelligence and stress reduction among students, particularly in educational contexts, is an emerging area of research. The integration of Artificial Intelligence tools in education can potentially alleviate stress by providing personalized learning experiences, offering mental health support, and improving time management.

Hypothesis Two tested the relationship between Academic Performance and Artificial Intelligence among Accounting Education students in Tertiary Institutions in Akwa Ibom State. The correlation coefficient calculated, is 0.873 and its square value is 0.762. These values show that there is an indication that Artificial Intelligence has a relationship of 0.88 with Academic Performance. The r^2 value indicates that Artificial Intelligence has a relationship of about 77.8% with Academic

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Performance. The p-value (Sig) is 0.020 < 0.05 at 239 degrees of freedom. Hence, the Null hypothesis is rejected, indicating that actually there is a significant relationship between Artificial Intelligence and Academic Performance. These findings are in line with the study conducted by Hwang, (2014) and Hwang et al., (2020) who opined that Artificial Intelligence in education is one of the most important goals to provide personalized learning guidance or support to individual students based on their learning status, preferences, or personal characteristics. The resurgence of Artificial Intelligence, driven by advances in machine learning, deep learning, and neural networks, has led to significant breakthroughs. AI is now integrated into numerous applications, from autonomous vehicles and healthcare diagnostics to personalized marketing and financial analysis (Yufeia et al., 2020).

CONCLUSION

Personalized learning systems, also known as adaptive learning platforms or intelligent tutoring systems, are typical and valuable applications of AI to support students and teachers. These applications give students access to various learning materials based on their specific learning needs and subjects (Akgun and Greenhow, 2021). Adaptive learning is also one of the most promising benefits of AI in education. While the traditional classroom education model continues to be one-size-fits-all, AI-powered adaptive learning systems are designed to maximize learning efficiency (Owoc et al., 2019). The future of AI holds enormous potential, with ongoing research in areas such as general AI, explainable AI (XAI), and AI-human collaboration. The integration of AI with emerging technologies like quantum computing and the continued evolution of AI-driven systems are likely to bring about further transformative changes.

As AI continues to evolve, its role in shaping the future of tertiary education will only grow, making it an indispensable tool for students and educators alike, reducing stress for educators and especially students. The integration of AI in education presents significant opportunities for reducing student stress through personalized learning, mental health support, time management, and stress monitoring. However, these benefits must be balanced with careful consideration of ethical implications and potential challenges. The deployment of Artificial Intelligence tools for stress reduction raises important ethical concerns, including privacy, data security, and the potential for over-reliance on technology. As Artificial Intelligence systems become more powerful and widespread, ethical considerations have gained prominence. Issues such as bias, privacy, job displacement, and the potential misuse of Artificial Intelligence technologies are now central to discussions about Artificial Intelligence's future. The literature on this topic is expanding, reflecting growing interest in how AI can support student well-being and academic success.

RECOMMENDATIONS

The recommendations for this study are:

1. AI in the education sector should be advanced in educational techniques through real-world trials and the development of standard modular prototypes in statistical reasoning, data visualization, and learning analytics.
2. Also AI in education should provide personalized learning guidance or support to individual students based on their learning status, preferences, or personal characteristics.
3. It is recommended that AI should be use to facilitate the instruction process (e.g., understanding and facilitating computer-supported collaborative learning through discourse analysis and achieving performance prediction through educational data mining), during which instructors are critical, and their acceptance of AI is vital.
4. Academics, educators, policymakers, and professionals must work together to address the new opportunities and challenges of the big data explosion and AI revolution. They must collaborate to develop all learners' necessary competencies and skills for twenty-first century work, driven by the knowledge economy.

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5. AI is critical in distance learning. For this, the application of AI in distance education should be explored with the use of computers to bridge the gap between students and educators.

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