INFLUENCE OF ARTIFICIAL INTELLIGENCE ON HEALTHCARE PRACTITIONERS' ENTREPRENEURSHIP AND SUSTAINABLE DEVELOPMENT CAPABILITIES IN COLLEGES OF NURSING SCIENCES, PLATEAU STATE

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Abstract

This study investigated the influence of Artificial Intelligence (AI) on healthcare practitioners' entrepreneurship and sustainable development capabilities in colleges of nursing sciences, Jos, Plateau state. Two objectives with their corresponding research questions guided the study. The study adopted a descriptive survey research design, with a total population of 385 staff. Sample of 105 staff members comprising academic and administrative personnel was randomly selected. AI in Nursing Education and Healthcare Development Questionnaire (AINEHDQ) was used as the instrument for data collection. Using Cronbach Alpha statistical tool, the instrument yielded reliability indices of 0.86. The research questions were analyzed using mean and standard deviation. The findings of the study revealed that AI positively influences healthcare practitioners' entrepreneurial capabilities by enhancing innovation and critical thinking. Additionally, the study showed that AI contributes to sustainable healthcare development by improving clinical training, diagnostic accuracy, and promoting digital health practices such as telemedicine. The study concluded that AI enhances healthcare practitioners' entrepreneurship and development capabilities. The study recommended enhanced capacity-building programs, increased investment in AI infrastructure, and the incorporation of entrepreneurship incubation platforms to maximize the benefits of AI in nursing education and healthcare transformation.

Keywords: Artificial Intelligence, Nursing Education, Healthcare Entrepreneurship, Sustainable Development

Introduction

The integration of Artificial Intelligence (AI) into nursing education represents a shift in how healthcare professionals are trained, particularly in developing regions like Plateau State, Nigeria. As the healthcare becomes increasingly complex, there is an urgent need to equip nursing students with innovative tools that enhance learning outcomes, promote critical thinking, and prepare them for the dynamic challenges of the healthcare sector. The adoption of AI technologies offers a timely solution to persistent challenges such as limited access to clinical training, shortages of qualified educators, and outdated instructional methods. AI

applications such as virtual simulations, intelligent tutoring systems, and data-driven analytics have the potential to personalize nursing education, simulate real-life clinical scenarios, and provide immediate feedback, thereby improving both theoretical knowledge and clinical proficiency (Topol, 2019 & Ahmed et.al, 2020).

Moreover, AI opens pathways for health entrepreneurship by empowering nursing staff and students to develop innovative healthcare solutions, start health-tech ventures, and engage in interdisciplinary collaboration (Foranda et.al, 2020). This entrepreneurial mindset is essential for driving healthcare innovation and economic development within the region. Moreover, AI contributes to the broader goal of sustainable healthcare development by improving service delivery, reducing costs, and promoting equitable access to quality healthcare. In line with Nigeria's digital health agenda and global health priorities, integrating AI into nursing education not only strengthens the healthcare workforce but also fosters resilient health systems (Eze, 2020). This study was prompted to explore the multifaceted implications of AI integration in nursing education, with a specific focus on its potential to foster healthcare entrepreneurship and sustainable healthcare development capabilities at the Colleges of Nursing Sciences, Plateau State.

Artificial Intelligence (AI) in education refers to the use of machine learning algorithms, natural language processing, and data analytics to create intelligent systems that can simulate human learning and adapt instructional processes to meet learners' needs. In modern education, AI technologies are being deployed to personalize learning experiences, automate administrative tasks, and support real-time performance assessments (Holmes et al., 2019). Tools such as intelligent tutoring systems, adaptive learning platforms, and virtual simulations have demonstrated the ability to improve learner engagement, feedback mechanisms, and educational outcomes (Luckin et al., 2016).

In professional fields such as nursing, AI enhances education by bridging gaps between theory and clinical practice. For instance, AI-driven simulations can recreate complex patient scenarios, allowing students to practice critical decision-making in a risk-free environment (Alam et.al, 2020). Furthermore, AI facilitates continuous learning by offering predictive analytics that track student progress and recommend tailored content, ensuring more efficient knowledge acquisition. As education evolves to meet the demands of a digital era, AI stands out as a pivotal innovation in transforming both teaching methodologies and learner experiences, especially in resource-constrained settings like Nigeria.

Health entrepreneurship refers to the identification and exploitation of opportunities to innovate and create value within the healthcare sector, often through the development of new products, services, or technologies that address existing health challenges (Buker & Smith, 2019). It encompasses a mindset that combines medical knowledge with business acumen, encouraging professionals including nurses to become innovators and problem-solvers in the delivery of healthcare. In the context of nursing education, fostering entrepreneurial thinking is essential to prepare students for roles beyond traditional clinical settings, empowering them to lead

community health initiatives, establish private practices, or develop health-tech startups (Hisrich, Peters & Shepherd, 2017).

The integration of Artificial Intelligence (AI) in nursing education has the potential to spark health entrepreneurship by exposing students to emerging technologies and equipping them with the skills to design and implement AI-driven solutions for local healthcare problems (WHO, 2021). For instance, AI tools can help nurses create mobile health applications for maternal care or develop data-driven strategies for disease surveillance. In environments where healthcare access and resources may be limited, promoting health entrepreneurship among nursing staff and students can catalyze innovative, cost-effective, and sustainable solutions tailored to community needs (Eze et.al, 2020).

On the other hand, sustainable healthcare development refers to the creation and maintenance of health systems that are efficient, accessible, equitable, and resilient enough to meet present healthcare needs without compromising the ability of future generations to meet theirs (Balet et.al, 2020). It emphasizes long-term improvements in health outcomes through the integration of economic, social, and environmental dimensions. In resource-constrained regions such as Plateau State, Nigeria, achieving sustainable healthcare requires innovative strategies that enhance workforce capacity, service delivery, and community engagement.

Artificial Intelligence (AI) plays a critical role in driving sustainable healthcare by optimizing decision-making, reducing medical errors, and expanding access to quality care, especially in underserved areas (Topol, 2019, Harris & Masiello, 2019). Integrating AI into nursing education ensures that future healthcare professionals are well-equipped with digital competencies to support preventive care, health promotion, and data-driven public health interventions. Furthermore, by fostering entrepreneurial thinking, AI empowers nursing students to develop scalable health innovations that address local challenges sustainably (Obi et.al, 2020). Embedding these principles into educational programs is essential for building a healthcare system that is not only efficient but also inclusive and forward-looking. The integration of Artificial Intelligence (AI) in nursing education is reshaping how nursing students learn, practice, and prepare for real-world healthcare challenges. This shift is especially relevant for institutions where access to advanced medical equipment, experienced faculty, and clinical placements may be limited (Gulet et.al 2021 Ramesh et.al, 2021). AI technologies such as Virtual Simulation, Augmented Reality (AR), Intelligent Tutoring Systems (ITS), Automated Grading and Feedback, and Natural Language Processing (NLP) offer scalable, cost-effective, and interactive solutions that enhance the quality and sustainability of nursing education.

The integration of Artificial Intelligence (AI) in nursing education offers substantial benefits, particularly in resource-constrained environments. As the global healthcare landscape shifts toward digitization, incorporating AI into nursing curricula provides staff and students with cutting-edge tools that improve learning outcomes, develop entrepreneurial capabilities, and support sustainable healthcare delivery. Notable benefits include enhanced clinical

competence, increased accessibility to learning resources, and improved academic performance. While the potential of Artificial Intelligence (AI) in nursing education is significant, integrating these technologies into Nigerian nursing institutions (Hisrich, Peters & Shepherd, 2017). The integration of Artificial Intelligence (AI) in nursing education has far-reaching implications not only for healthcare delivery but also for the broader healthcare entrepreneurship ecosystem. The infusion of AI into the nursing curriculum can promote innovation, enhance business development skills, and foster interdisciplinary collaboration. These factors are critical for developing a workforce capable of driving healthcare entrepreneurship and contributing to sustainable healthcare development in the region.

Moreover, the integration of Artificial Intelligence (AI) in nursing education has profound implications for advancing sustainable healthcare development. As healthcare systems globally strive for efficiency, equity, and accessibility, AI technologies offer new pathways to improve healthcare delivery. Key areas where AI can contribute to sustainable healthcare development include data-driven decision-making, strengthening health systems, and reducing healthcare costs. These factors are critical in building a healthcare infrastructure that is both sustainable and capable of meeting the evolving needs of populations. The integration of Artificial Intelligence (AI) into nursing education presents a transformative opportunity for improving healthcare delivery, particularly in countries like Nigeria. As the need for skilled healthcare professionals continues to grow, the Nursing and Midwifery Council of Nigeria (NMCN) plays a pivotal role in shaping the future of nursing education and practice. A strategic approach is required to ensure the successful implementation of AI in nursing education, addressing key areas such as curriculum revision, capacity building, public-private partnerships, and the establishment of robust policy and ethical guidance (Alam, 2020).

Objectives of the Study

The study was guided by the following objectives:

1. To determine the influence of Artificial Intelligence on healthcare practitioners' entrepreneurship skills in colleges of nursing sciences in Plateau state.
2. To assess the influence of Artificial Intelligence on healthcare practitioners' development capabilities in colleges of nursing sciences in Plateau state.

Research Questions

The study answered the following questions:

1. What is the influence of Artificial Intelligence on healthcare practitioners' entrepreneurship skills in colleges of nursing sciences in Plateau state?
2. How does Artificial Intelligence influences healthcare practitioners' development capabilities in colleges of nursing sciences in Plateau state?

Methodology

The study employed a descriptive survey research design. This design was suitable because it enables the researcher to gather opinions, perceptions, and experiences of staff regarding the integration of Artificial Intelligence (AI) into nursing education and its implications for health entrepreneurship and sustainable healthcare. The population comprised all academic and administrative staff of the College of Nursing Sciences, Jos, Plateau State, with specific interest in those involved in educational planning, implementation, or innovation. A sample of 105 staff was selected using a purposive sampling technique, targeting individuals knowledgeable about the subject matter. A structured questionnaire titled: "AI in Nursing Education and Healthcare Development Questionnaire (AINEHDQ)" was developed. Each item was rated on a 4-point Likert scale: Strongly Agree (SA) – 4, Agree (A) – 3, Disagree (D) – 2 and Strongly Disagree (SD) – 1. The instrument was validated by three experts in Education and Measurement and Evaluation. Reliability was tested using the Cronbach Alpha method, which yielded a coefficient of 0.86, indicating good internal consistency. Descriptive statistics (Mean and Standard Deviation) were used to answer the research questions. A criterion mean of 2.50 was used: Mean ≥ 2.50 = Accepted and Mean < 2.50 = Rejected.

Results

Research Question 1: What is the influence of Artificial Intelligence on healthcare practitioners' entrepreneurship skills in colleges of nursing sciences in Plateau state?

Table 1: Mean and Standard Deviation of AI on health entrepreneurship skills

S/N	Items	Mean	Std.	Remark
1.	AI skills empower healthcare practitioners to innovate and develop health solutions	3.26	0.65	Accepted
2.	Exposure to AI encourages entrepreneurial mindset in nursing practitioners	3.18	0.70	Accepted
3.	Healthcare practitioners are trained to identify healthcare needs using AI tools	2.90	0.76	Accepted
4.	AI-based education fosters creativity and startup ideation in healthcare profession	3.00	0.81	Accepted
5.	Healthcare practitioners are supported to launch AI-driven health startups after graduation	2.30	0.88	Rejected
	Average Mean	**2.93**		**Accepted**

Table 1 revealed that AI integration positively contributes to entrepreneurial skills of healthcare practitioners. This is evident with the average mean of 2.93. However, institutional support for after graduation health startups is lacking and should be improved with the average mean score of 2.30.

Research Question 2: How does Artificial Intelligence influences healthcare practitioners' development capabilities in colleges of nursing sciences in Plateau state?

Table 2: Analysis of Mean and Standard Deviation on AI in Promoting Sustainable Healthcare Development

S/n	Items	Mean	Std.	Remark
1.	AI aids in patient care simulation, improving future healthcare delivery	3.45	0.58	Accepted
2.	AI tools enhance diagnostic accuracy and treatment planning	3.40	0.66	Accepted
3.	Nurses trained with AI are more adaptable to global healthcare trends	3.31	0.63	Accepted
4.	Integration of AI reduces long-term training costs	2.76	0.77	Accepted
5.	AI supports sustainable practices like telehealth and mobile diagnostics	3.20	0.70	Accepted
	Average Mean	**3.22**		**Accepted**

Table 2 revealed that AI contributes significantly to sustainable healthcare development, equipping nursing graduates with advanced competencies that align with modern health systems with the average mean score of 3.22.

Discussion of Findings

The findings on objective and research question one revealed that AI influences healthcare practitioners' entrepreneurship skills. This finding agrees with the findings of Topol (2019) which revealed that integration of Artificial Intelligence (AI) in nursing education offers an exciting avenue for enhancing entrepreneurship excellence. The finding is also in line with the findings of Eze (2020) that AI's potential to revolutionize nursing education lies in its ability to improve clinical competence, increase accessibility, and foster academic excellence. The study findings supported the assertion of Alam (2020) that as nursing education evolves, incorporating AI tools such as virtual simulations, automated feedback systems, and natural language processing can significantly enhance the essential entrepreneurship skills of nursing practitioners for real-world healthcare challenges.

Moreover, the findings on objective and research question two revealed that AI has the potential to stimulate healthcare practitioners' development capabilities. This finding agrees with the findings of Hisrich et.al (2017) which revealed that AI promotes entrepreneurship ventures in healthcare profession. It also contributes to sustainable healthcare development through data-driven decision-making, improved healthcare services, and cost-efficiency. This finding also agrees with the findings of Holmes et.al (2019) that Artificial Intelligence in nursing education holds promise for developing entrepreneurial capabilities of healthcare practitioners and promote sustainable healthcare delivery.

Conclusion

The study concluded that AI enhances healthcare practitioners' entrepreneurship skills and promote sustainable development capabilities.

Recommendations

Based on the findings and the conclusion drawn, the study recommended the following:

1. That government should increase funding and support for the integration of AI in nursing education to foster research on the use of AI in nursing education and entrepreneurship innovation.
2. Colleges of nursing administrators should implement ongoing training programs for nursing educators to ensure they can effectively use AI technologies.

References

Ahmed, F., Rehman, S., & Naqvi, S. (2020). Capacity Building for Nursing Educators: The Role of AI and Technology in Teaching and Learning. International Journal of Nursing Education, 25(2), 34-42.

Alam, F., & El-Sabagh, H. A. (2020). Augmented reality in healthcare education: An integrative review. Education and Information Technologies, 25(3), 1445–1459.

Buker, T., & Smith, L. (2019). Educ-AI-tion Rebooted? Exploring the Future of Artificial Intelligence in Schools and Colleges. Nesta.

Eze, B. (2020). "Entrepreneurship in Health: Opportunities and Challenges in Nigeria." Nigerian Journal of Health Economics, 5(2), 45–53.

Eze, S. C., Chinedu-Eze, V. C., & Bello, A. O. (2022). Faculty Competence and Technology Readiness in Higher Education: Barriers to Artificial Intelligence Adoption. International Journal of Education and Development Using ICT, 18(1), 124–140.

Foronda, C., Fernandez-Burgos, M., Nadeau, C., Kelley, C. N., & Henry, M. N. (2020). Virtual Simulation in Nursing Education: A Systematic Review Spanning 1996 to 2018. Simulation in Healthcare, 15(1), 46–54.

Gul, M., Kim, J., & Lee, S. (2021). Revising the Nursing Curriculum to Incorporate Artificial Intelligence: A Global Perspective. Nurse Education Today, 99, 104869.

Harris, A., & Masiello, I. (2019). Developing Business and Entrepreneurial Skills in Healthcare: A Framework for Future Nurses. Nursing Management, 26(6), 8–13.

Hisrich, R. D., Peters, M. P., & Shepherd, D. A. (2017). Entrepreneurship. McGraw-Hill Education.

Holmes, W., Bialik, M., & Fadel, C. (2019). Artificial Intelligence in Education: Promises and Implications for Teaching and Learning. Center for Curriculum Redesign.

Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). Intelligence Unleashed: An Argument for AI in Education. Pearson.

Obi, T. C., Okoye, M. U., & Nwachukwu, P. C. (2020). Funding Challenges in Nigerian Tertiary Institutions and Implications for Educational Technology Adoption. Journal of Education and Practice, 11(36), 49–56.

Ramesh, S., Krishnan, A., & Ali, M. (2021). AI for Predictive Analytics in Healthcare. Journal of Artificial Intelligence in Medicine, 114, 35-42.

Topol, E. (2019). Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again. Basic Books.

World Health Organization (WHO). (2021). Global Strategy on Digital Health 2020–2025. Geneva: WHO.