KNOWLEDGE AND PERCEPTION REGARDING AI AMONG SECONDARY SCHOOL PHYSICAL AND HEALTH EDUCATION TEACHERS IN UYO LGA OF AKWA IBOM STATE

Udofa, Matthew Nse
Department of Physical and Health Education,
University of Uyo, Uyo, Akwa Ibom State

Abstract
The application of Artificial Intelligence (AI) in education has gained significant attention in recent years, with various studies exploring its impact across different subjects. This study examined the knowledge and perceptions of PHE teachers regarding AI and the implications for teaching PHE. Descriptive survey design was adopted for the study, with a population of thirty-five (35) PHE teachers. All the thirty-five teachers participated in the study. A structured questionnaire with a reliability coefficient of 0.86, was used as instrument for collecting data for the study. Data analysis was done using mean, and independent t-test. Findings of the study revealed that PHE teachers have low level of knowledge regarding AI irrespective of their years of experience (t-cal =1.42; p-value =0.081). Also, male PHE teachers have positive perception regarding the use and adoption of AI in teaching PHE in secondary schools (t-cal =2.72; p-value =0.000). Lack of adequate training (M=3.17), high costs of implementing AI technologies (M=2.90), as well as lack of adequate knowledge of AI by the teachers (M=2.72) were the notable barriers to effective adoption of AI technologies in the teaching of PHE in secondary schools. It was recommended among others that PHE teachers, both in public and private sectors should be trained on the integration of AI in education to facilitate teaching and learning of PHE in secondary schools.

Keywords: Application of artificial intelligence, Knowledge regarding AI, Years of experience, Positive perception

Introduction

The integration of artificial intelligence (AI) into educational frameworks is a growing trend, transforming various fields, including Physical and Health Education (PHE). The adoption of AI technologies in education has the potential to enhance teaching methodologies, improve student engagement, and facilitate personalized learning experiences (Akgun& Greenhow, 2022). However, the effective implementation of AI tools in PHE is heavily reliant on teachers' knowledge and perceptions regarding these technologies.

Artificial intelligent (AI) applications in education encompass a range of technologies, including adaptive learning systems, intelligent tutoring, and data analytics tools. These technologies can assist teachers in tailoring lessons to meet individual student needs, analyzing student performance data, and providing real-time feedback (Fekumo&Honmane, 2025). In the context of PHE, AI can help in designing personalized

fitness programs, tracking student health metrics, and enhancing physical activity through gamification and interactive learning environments (Kaya, 2025).

Teachers' knowledge and perceptions of AI significantly influence their willingness and ability to incorporate these technologies into their teaching practices (Mahdum et al., 2019). For PHE teachers, understanding AI's capabilities can lead to innovative approaches in delivering content and assessing student performance. Conversely, a lack of knowledge or negative perceptions can create barriers to adoption, ultimately hindering the potential benefits of AI integration (Fekumo&Honmane, 2025). Research indicates that educators often feel underprepared to utilize AI effectively, citing inadequate training and support as major obstacles (Kim & Park, 2021). This situation is particularly critical in PHE, where teachers may prioritize traditional methods over technology-driven approaches due to a lack of familiarity with AI applications and their benefits.

Artificial Intelligence has been increasingly recognized for its potential to revolutionize education through personalized learning, enhanced student engagement, and more efficient administrative processes. AI tools, such as intelligent tutoring systems, learning analytics, and adaptive learning platforms, have been effectively utilized in subjects like mathematics and science to support student teaching (Zhou et al., 2023). However, the use of AI in PHE is less documented, primarily due to the physical and experiential nature of the subject, which may seem less conducive to technological intervention (Kim & Park, 2021).

The advent of artificial intelligence (AI) is reshaping various fields, including education. However, the integration of AI into physical and health education (PHE) remains limited, especially at the secondary school level. Many PHE teachers may lack awareness or a clear understanding of how AI can enhance teaching and learning experiences. The perception of these teachers towards AI's potential benefits and challenges in teaching PHE is crucial for its successful adoption. The current literature highlights a significant gap in research focusing specifically on PHE teachers' perceptions of AI. While some studies have explored the general impact of AI in educational settings, there remains a need to investigate how PHE teachers view the integration of AI in their curriculum (Buchanan et al., 2021). Factors such as educational background, experience with technology, and institutional support play crucial roles in shaping these perceptions. Moreover, as the education sector continues to evolve with advancements in technology, understanding PHE teachers' level of knowledge and how they (PHE teachers) perceive and are prepared for AI integration is essential for developing effective professional development programs and curricular reforms. This study therefore aims at examining the knowledge and perceptions of PHE teachers regarding AI and the implications for teaching PHE in secondary schools in Uyo LGA of Akwa Ibom State.

Despite the traditional focus of PHE on physical activity and health, AI can offer valuable opportunities for personalized fitness programs, injury prevention, and real-time feedback on performance. Wearable technology, motion capture systems, and AI-driven fitness applications can provide data that helps students monitor their health and physical progress (Kim &Park, 2021). Similarly, Kaya (2025) maintained that AI can also assist in assessing student performance more objectively, providing teachers with insights that are

difficult to obtain through conventional methods. However, for AI to be effectively integrated into PHE, teachers need a strong understanding of its capabilities and limitations. According to Moss (2021) many educators are aware of AI's potential but feel underprepared to incorporate it into their teaching due to limited training and resources. This challenge is particularly pronounced in subjects like PHE, where teachers may perceive a disconnect between AI's digital nature and the physical focus of their discipline.

Theoretical Framework

This study is built on two theories. These include: Technology Acceptance Model (TAM), and Diffusion of Innovations Theory (DOI)

Technology Acceptance Model (TAM): The Technology Acceptance Model (TAM) is one of the most widely used theories to explain how users come to accept and use technology. This model was propounded by Fred Davis in 1986. It posits that two main factors determine an individual's intention to use a particular technology: perceived usefulness (how the technology improves performance) and perceived ease of use (how easy the technology is to implement). (Davis, 1986). According to TAM, these two factors are the primary determinants of an individual intention to use a technology, which in turn predicts his/her actual usage behaviour.In the context of teaching PHE using AI, teachers' knowledge and perception are critical. If teachers perceive AI as useful in improving the teaching and learning process in physical and health education, and if they find it easy to use, they are more likely to adopt it in their instruction. However, if they perceive AI as not useful or stressful to use in delivering their lesson during PHE classes, they would be less likely to use or adopt it in their instructions.

Diffusion of Innovations Theory (DOI):The Diffusion of Innovations Theory was developed by Everett Rogers in 1962. This theory explains how, why, and at what rate new technologies or innovations spread through cultures. The theory suggests that individuals' adoption of new technology (such as AI in teaching) is influenced by factors like relative advantage, compatibility with existing practices, complexity, trial ability, and observability (Rogers, 2003). The end result of this diffusion is that people, as part of a social system, adopt a new idea, behaviour, or product. Hence, the key to this adoption is that the person must perceive the idea, behaviour, or product as new or innovative. In the context of PHE, teachers' knowledge and perception about AI could influence the rate at which AI is integrated into their teaching methods. If teachers see AI as compatible with current educational goals and find it relatively easy to trial and observe, they are more likely to adopt it, but if otherwise, adoption of such technology becomes difficult.

Baker and Smith (2019)explored the impact of AI technologies on physical education teaching. The findings revealed that although AI could personalize physical training, most PHE teachers lacked the required knowledge to integrate AI tools effectively. Many teachers expressed a positive attitude toward learning AI-based methodologies but faced barriers such as lack of training and resources.Hew and Brush (2018) investigated general teachers' attitudes toward technology adoption in schools, which included AI applications. Although the study did not specifically target PHE teachers, the findings are relevant. Teachers showed a willingness to adopt new

technologies but identified major challenges such as inadequate knowledge, professional development, and fear of AI replacing human teaching functions.Zhou et al. (2023) examined the Application of artificial intelligence in physical education. Their survey of secondary school teachers in European countries revealed that most teachers had limited knowledge of AI's applications in PHE. However, those familiar with AI tools believed that they could revolutionize performance monitoring, individualized instruction, and injury prevention.

Liu et al. (2020) examined Teacher readiness for AI in education. The study found that while teachers acknowledged the potential of AI in health and physical education, most felt unprepared to incorporate AI into their lessons due to a lack of training and resources. The research called for more targeted professional development to enhance teachers' AI literacy.Kim et al. (2020) investigated how AI can be used to enhance student engagement in physical education. They conducted interviews and surveys with PHE teachers in Singapore, findings of the study revealed that while some teachers were enthusiastic about AI's potential to enhance personalized student engagement, a significant knowledge gap persisted regarding how to effectively use AI tools in lesson planning and assessment.Irwahand et al. (2022) investigated the perceived barriers to adopting ICTs in PE lessons among high school teachers in Malaysia. The study found that insufficient number of computers and an insufficient number of computers connected to the internet, inadequate knowledge of AI technologies among teacher, high cost of purchasing and maintaining AI gadgets among others pose as barriers to effective adoption of ICTs in PE lessons among high school teachers. Prior to the adoption and use of AI in teaching, teachers' knowledge and how they view the application is of utmost importance to put into consideration. Therefore, the aim of this study is to investigate the knowledge and perceptions of PHE teachers regarding AI and the implications for teaching PHE in secondary schools in Uyo LGA of Akwa Ibom State.

Methodology

The study adopted descriptive survey research design. The study was carried out in Uyo Educational Zone, in Uyo L.G.A of Akwa Ibom State. The population of the study comprised all professional PHE teachers in the fourteen (14) public secondary schools in Uyo Educational Zone. Thus, the population of the study consisted of thirty-five (35) PHE teachers (24 male and 11 female) who were drawn from the 14 public schools (source: Schools' Staff Disposition Record). Since the population size is manageable, therefore all the 35 PHE teachers participated as respondents for the study.

A researcher-developed questionnaire titled 'Knowledge and Perception of Physical and Health Education Teachers towards Teaching PHE Using Artificial Intelligence in Secondary Schools Questionnaire (KPPHETTUAIQ)' was used as instruments for collecting data for the study. The instrument comprised of two sections; A and B. Section A contained demographic information of respondents, while section B contained information on the variables under study. The items in the questionnaire were framed in four-point rating scale of Strongly Agree (SA); Agree (A); Disagree (D); and Strongly

Disagree (SD), scored 4, 3, 2 and 1 respectively, for all positive items, while reverse score for all negative items.

In order to establish the validity of the instrument, the instrument was given to three experts for scrutiny, to ensure it measures what it was purported to measure. Two experts from the Department of Human Kinetic and Health Education, and one expert from Measurement and Evaluation Department, all in Faculty of Education, University of Uyo. Corrections were made in necessary areas. Some statements were restructured, while some were added as a result of the experts' advice. The final copy of the questionnaire was formed, which was valid for the study. The reliability of the instrument was tested using Cronbach alpha and it yielded an overall reliability coefficient of .86, which was considered high enough for use in the study.

The instrument was administered personally by the researchers to the respondents. The respondents were accessed in their respective schools. An introductory letter accompanied the questionnaire, where the purpose of the study was made known to the respondents. Participation in the study was based on willingness of the respondents. The administered instruments were completely filled and retrieved on the spot, same day. All the 35 instruments administered were correctly filled and returned, giving 100% return rate, which was used for data analysis. Mean and Standard Deviation were used to answer the research questions, while independent t-test analysis was used to test the null hypotheses. All hypotheses were tested at .05 level of significance. The criterion mean was estimated at 2.5. Therefore, mean scores equal or greater than 2.5 is regarded as good knowledge and positive perception for all positive statements, while mean score less than 2.5 is regarded as poor knowledge and negative perception.

Result

Research Question One: What is the difference in PHE teachers' level of knowledge of regarding the use of AI based on their years of experience in teaching PHE in secondary schools?

Table 1: Mean responses of the level of knowledge of PHE teachers about AI Based on level of teaching experience (N=35)

Years of Experience	N	$\bar{x}$	SD	Decision
1-10 Years	35	2.15	1.86	poor
11-20 Years	35	2.19	0.98	poor

Result in Table 1 showed that PHE teachers with 1-10 years teaching experience had a mean score of 2.15 indicating poor level of knowledge regarding AI. Similarly, PHE teachers with 11-20 years teaching experience had a mean score of 2.19, which equally indicated poor level of knowledge regarding AI. This means that there is no difference in the level of knowledge of PHE teachers regarding AI based on their years of experience.

Research Question Two: What is the difference in the perception of male and female PHE teachers toward the use of AI in teaching PHE in secondary schools?

Table 2: Mean responses and standard deviation of the perception of PHE teachers toward the use of AI in teaching PHE in secondary schools (N=35)

Gender	N	$\bar{x}$	SD	Decision
Male	35	2.63	2.96	Good
Female	35	2.25	3.01	Poor

Result in Table 2 showed that male teachers had positive perception regarding the use of AI in teaching PHE with a mean score of 2.63, while female teachers had negative perception regarding the use of AI in PHE teaching with a mean score of 2.25.

Research Question Three: What are the barriers to effective adoption of AI technologies in the teaching of PHE in secondary schools?

Table 3: Mean responses and standard deviation of the barriers to adoption of AI in teaching PHE in secondary schools (N=35)

S/N	Statement	$\bar{x}$	SD	Decision
1.	Lack of adequate training for teachers	3.17	0.98	B
2.	High costs of implementing AI technologies	2.90	0.92	B
3.	Privacy and data security issues	2.24	0.95	N B
4.	Decreased teacher-student interaction	2.05	1.01	NB
5.	Lack of adequate knowledge about AI	2.72	0.93	B

B=barrier; NB= Not a barrier

Result in Table 3 showed that items 1, 2, and 5 with mean scores of 3.17, 2.90, and 2.72 respectively, serve as barriers to effective adoption of AI technologies in the teaching of PHE in secondary schools, while items 3, and 4, with mean scores of 2.24, and 2.05 respectively, were not barriers to effective adoption of AI technologies in the teaching of PHE in secondary schools.

$H_0$1: There is no significant difference in the level of knowledge of PHE teachers on the use of artificial intelligence (AI) based on their years of teaching experience in secondary schools.

Table 4: T-Test of no significant difference in PHE teachers' level of knowledge of AI

Variable	N	Mean	Std. Dev.	Df	t-cal	p-value	Decision
1-10 Years	35	2.15	1.86	33	1.42	0.081	*H_0 retained
11-20 Years	35	2.19	0.98				

Table 4 revealed a calculated t-value of 1.42 and a p-value of 0.081 which is greater than 0.05 level of significance at 33 degree of freedom. Since the p-value (0.081) is greater than 0.05, therefore the null hypothesis is retained. This result means that there is no significant difference in the level of knowledge of PHE teachers on the use of Artificial Intelligence (AI) based on their years of teaching experience in secondary schools. Therefore, the hypothesis which stated that there is no significant difference in the level of knowledge of PHE teachers on the use of artificial intelligence (AI) based on their years of teaching experience in secondary schools is retained.

$H_0$2: There is no significant difference in the perception of male and female PHE teachers on the use of artificial intelligence in teaching PHE in secondary schools.

Table 5: T-Test ofno significant difference in the perception of male and female PHE teachers

Variable	N	Mean	Std. Dev.	Df	t-cal	p-value	Decision
Male	35	2.63	2.96	33			
Female	35	2.25	3.01		2.72	0.000	*Significant

Result in Table 5 revealed a calculated t-value of 2.72 and a p-value of 0.000 which is less than 0.05 level of significance at 33 degree of freedom. Since the p-value (0.000) is less than 0.05, therefore the null hypothesis is rejected. This result means that the perception of male PHE teacher differs significantly from the female PHE teachers with regards to the use of artificial intelligence in teaching PHE in secondary schools. Hence, the hypothesis which stated that there is no significant difference in the perception of male and female PHE teachers on the use of artificial intelligence in teaching PHE in secondary schools is rejected.

Discussion of Findings

Findings on the level of knowledge of PHE teachers about AI, based on their years of teaching experience reveals from the data analysis that there is no significant difference in the level of knowledge of PHE teachers regarding AI, as the knowledge of the teachers about AI was poor, irrespective of their years of teaching experience. This finding is in agreement with Zhou et al. (2023) whose survey of secondary school teachers in European countries revealed that most teachers had limited knowledge of AI's applications in PHE. Baker and Smith (2019)also revealed that although AI could personalize physical training, most PHE teachers lacked the required knowledge to integrate AI tools effectively.

The study revealed that teachers' perceptions regarding AI and the implications for teaching PHE were significantly influenced by gender and not by experience. Male teachers tend to have more positive perceptions of AI compared to female teachers. This finding has important implications for the development of teacher training programs related to AI integration in learning.This finding agrees with Rogers (2003) who revealed thatnegative perceptions can create barriers to adoption, ultimately hindering the potential benefits of AI integration in PHE.

Findings on the barriers to effective adoption of AI technologies in the teaching of PHE in secondary schools reveals that the major barrier pointed out by teachers is lack of adequate training for teachers, followed by high costs of implementing AI technologies, as well as lack of adequate knowledge about AI. This finding supports the findings of Smith and Roberts (2020) whose study revealed that many teachers expressed a positive attitude toward learning AI-based methodologies but faced barriers such as lack of training, lack of knowledge about AI, and lack of resources.

Conclusion

From the result obtained from this study, it was concluded that PHE teachers have low level of knowledge regarding AI. Also, male PHE teachers have positive perception regarding the use and adoption of AI in teaching PHE subject in secondary schools. Finally, it was found that the barriers to effective adoption of AI technologies in teaching PHE subject in secondary schools include but not limited to,lack of adequate training for teachers in the use of AI,high costs of implementing AI technologies, as well as lack of adequate knowledge of AI by the teachers.

These findings address the potential of AI in physical education and the challenges encountered, providing a crucial foundation for future research and applications. The effective use of AI in education will support the individual development of students and contribute to the professional development of teachers. Therefore, further research on the role and impact of AI in physical education is of great importance.Based on the findings of this study, the following recommendations were made;

i. PHE teachers, both in public and private sectors should be trained on the integration of AI in education to facilitate teaching and learning of PHE in secondary schools.
ii. Teachers, especially females should be educated on the need to embrace AI technologies in teaching of PHE in secondary schools. This will help overcome resistance to introduction of AI in education
iii. AI gadgets should be made available to teachers freely. This will enhance effective adoption of the technology in teaching.

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