Effect of Artificial Intelligence (AI) on Teacher's Skills and Teaching Aids in Physical Education

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Abstract

Artificial Intelligence is gradually influencing teaching practices in many subjects, including Physical Education. Physical Education teaching depends heavily on demonstration, observation, practice, and regular feedback, which makes teachers' professional skills very important. This study examines the effect of Artificial Intelligence on teachers' skills and teaching aids in Physical Education. Teachers were actively engaged in using digital tools such as video analysis applications, fitness tracking devices, and digital performance records during their regular teaching activities. Their experiences, reflections, and classroom practices formed the core of this study.

A descriptive qualitative approach was adopted to understand how these digital tools influenced teaching practices. Data were collected through classroom observations, group discussions, reflective journals maintained by teachers, and detailed case documentation. The collected information was analyzed using thematic analysis to identify common patterns related to instructional skills, lesson organization, assessment practices, and student involvement.

The findings show that the use of digital tools helped teachers improve clarity of instruction, accuracy in performance assessment, and confidence in lesson delivery. Visual feedback supported better explanation of physical skills

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and encouraged individual guidance for students. Students displayed higher motivation, better participation, and improved understanding of movement techniques. Some challenges were also noted, including limited digital facilities, lack of structured training, and initial hesitation in adopting technology.

The study concludes that meaningful engagement with digital teaching aids can strengthen teachers' skills and enhance the quality of Physical Education teaching. Continuous professional support and suitable infrastructure are essential for effective classroom application. This approach supports long term improvement.

Keywords: *Teacher Skills; Teaching Aids; Physical Education; Instructional Technology; Digital Innovation*

1. Introduction

Physical Education is an essential part of school and college education because it supports physical fitness, mental well-being, discipline, teamwork, and healthy lifestyles. Physical Education teachers guide students in developing motor skills, physical strength, coordination, and positive attitudes toward physical activity. Teaching in this subject is different from classroom-based subjects because it depends heavily on demonstration, observation, practice, and continuous feedback. Teachers must carefully observe movements, correct techniques, motivate students, and ensure safety during activities. These responsibilities demand strong professional skills and effective teaching aids.

In traditional physical education settings, teachers mainly rely on verbal instructions, physical demonstrations, and manual observation to assess student performance. While these methods remain important, they often create challenges in large classes where individual attention is limited. Assessing movement accuracy, effort level, and improvement can become subjective, and students may not always understand verbal feedback clearly. Time constraints and varying student abilities further increase the difficulty of effective instruction. These challenges highlight the need for supportive tools that can strengthen teaching practices [1, 2].

Recent developments in digital technology have introduced new possibilities for improving teaching and learning experiences. Artificial Intelligence refers to digital systems that can process information, identify patterns, and support decision-making. In Physical Education, such technology appears in the form of motion recording applications, fitness tracking devices, digital performance records, and online instructional

resources. These tools assist teachers by providing visual evidence of movement, recorded data of physical activity, and organized feedback systems that enhance understanding.

The role of the teacher remains central even when digital tools are introduced. Technology does not replace the teacher but supports professional judgment and instructional effectiveness. When teachers actively engage with these tools, reflect on their experiences, and adapt their teaching strategies, their professional skills can improve. Teachers become more confident in explaining skills, monitoring progress, and guiding students toward improvement.

In the Indian educational context, national reforms emphasize the use of technology to improve teaching quality and holistic development. Policies encourage innovative teaching practices and professional development for teachers. Within this environment, understanding how digital tools influence teachers' skills and teaching aids in physical education becomes important. This study focuses on teachers' real classroom experiences with digital teaching aids and examines how these tools support skill development, instructional clarity, and effective Physical Education teaching.

This research aims to examine the effect of digital tools on teachers' professional skills and teaching aids in Physical Education through their active involvement in classroom practice. Teachers explored available technologies, applied them during lessons, observed student responses, and reflected on changes in their own teaching methods. Their shared experiences highlight practical benefits, challenges, and learning outcomes linked with technology use. By focusing on teachers' voices and classroom realities, the study provides meaningful insights into improving Physical Education instruction. The findings may help teachers, teacher educators, administrators, and policymakers understand how supportive digital practices can strengthen teaching quality, promote student engagement, and encourage continuous professional growth in Physical Education settings. Such informed approaches support balanced learning environments and long-term educational development, nationwide adoption.

2. Statement of the Problem

Despite the increasing availability of Artificial Intelligence tools and digital teaching aids, there is limited understanding of how these technologies affect teachers' instructional skills and the quality of teaching

aids in Physical Education. Many PE teachers lack access to structured training on AI, face infrastructural limitations, and may be uncertain about integrating technology into practical, activity-based teaching. The problem addressed in this study is to examine the effect of Artificial Intelligence on teachers' professional skills and use of teaching aids in Physical Education in real classroom contexts.

3. Objectives of the Study

- To examine the effect of Artificial Intelligence on teachers' instructional and professional skills in Physical Education.
- To explore how AI-based teaching aids support teaching and learning in Physical Education.
- To document teachers' experiences, reflections, and perceptions regarding the use of AI tools.
- To identify benefits and challenges associated with the use of AI in PE teaching.
- To suggest actionable recommendations for effective integration of AI in Physical Education.

4. Significance of the Study

This study is significant for various stakeholders:

- **Teachers:** It offers insight into how AI tools can enhance instructional clarity, assessment accuracy, and professional confidence.
- **Teacher Educators:** The findings can guide curriculum design for teacher training programs, integrating technology skills specific to Physical Education.
- **School Administrators:** Results provide evidence for infrastructure investments and professional development planning.
- **Policymakers:** The study aligns with national policies and offers recommendations to support technology-enabled education and sports pedagogy

5. Review of Literature

5.1 Artificial Intelligence and Teaching Practices

Recent studies in education show that digital technologies are changing how teachers plan, teach, and assess students. Artificial Intelligence-based tools help teachers manage information, analyses

performance, and improve decision-making in teaching. Research by Holmes, Bialik, and Fadel (2019) explains that such technologies support teachers rather than replace them. Teachers remain responsible for instruction, while digital tools assist in observation, feedback, and evaluation [3]. This support is especially useful in subjects that involve continuous monitoring of learner performance.

In teaching-learning environments, digital tools help teachers reduce manual workload and focus more on student interaction. Studies highlight that when teachers use technology regularly and reflect on its use, their professional skills gradually improve. Teachers become more confident in lesson planning, classroom management, and assessment practices.

5.2 Technology Use in Physical Education

Physical Education is a practical subject where learning takes place through movement, practice, and repetition. Traditional Physical Education teaching relies mainly on demonstration and verbal explanation. However, research indicates that these methods alone may not be sufficient for accurate assessment and individual guidance. Bailey and Morley (2020) found that video-based tools in Physical Education help teachers observe movement patterns clearly and explain techniques more effectively [4].

5.3 AI and Physical Education: Opportunities and Challenges

Studies specifically focusing on AI in Physical Education settings highlight both opportunities and challenges. For instance, research involving PE teachers found that AI can enhance class management, personalized feedback, skill assessment, and even the design of activities that match individual student needs. Teachers see AI as a potential co-teacher that assists with data gathering and performance evaluation, but they also express concerns about data privacy, technological readiness, and unequal access to digital tools.

Another study emphasizes that realistic AI applications must go beyond classroom video recording. Researchers are working on frameworks that can automatically analyze motion signals in open and complex Physical Education environments, and provide actionable feedback to both teachers and students. These advanced systems could support teachers' instructional planning and help tailor activities to meet diverse learner needs in real time.

5.4 Teacher Skills and Professional Development

Teacher skill development is closely linked to continuous learning and reflective practice. Mishra and Koehler (2006) introduced the concept of Technological Pedagogical Content Knowledge, which highlights that effective teaching occurs when teachers combine subject knowledge, teaching methods, and technology use [5]. In Physical Education, teachers need opportunities to practice using digital tools and reflect on their classroom experiences.

Studies conducted in Indian educational settings show that teachers are generally positive about technology but face challenges such as lack of training, limited resources, and technical difficulties. When teachers receive proper guidance and institutional support, they are more willing to adopt new teaching aids and improve their instructional practices.

5.5 Where will machines find wisdom?

Technology will advance, but humans will make the decisions. Blair Effron highlights a critical distinction for the future of Physical Education: while Artificial Intelligence can function as a powerful teaching aid by automating data analysis and visual content creation, it fundamentally lacks the essential human quality of "Vivek," or wisdom. Effron posits that machines cannot replicate the nuanced decision-making and ethical judgment required in leadership and education, suggesting that the primary effect of AI on teacher's skills will be to elevate the value of human insight over mere information processing [6]. Consequently, in the context of sports and physical training, AI should be leveraged to handle technical inputs and efficiency, allowing teachers to focus on the irreplaceable elements of mentorship, strategic adaptation, and holistic student development which machines cannot provide.

5.6 National Education Policy (NEP) 2020 and Physical Education

The National Education Policy 2020 strongly supports the use of technology in education to improve teaching quality and learning outcomes. NEP 2020 highlights the importance of teacher professional development and digital literacy. It encourages the integration of educational technology to support personalized learning, effective assessment, and innovative teaching methods.

NEP 2020 also recognizes Physical Education as an important component of holistic education, contributing to physical, mental, and social

development. The policy encourages the use of modern tools and methods to enhance learning experiences. This policy framework supports the use of digital teaching aids in Physical Education and strengthens the role of teachers in adopting innovative practices.

6. Case Studies

Case Study 1: Use of AI-Supported Video Analysis in School Physical Education: In a secondary school Physical Education class, a teacher introduced video-based analysis tools to support skill learning during athletics lessons. Students' movements were recorded while performing sprinting and jumping activities. The software allowed slow-motion viewing and basic automated feedback on posture and movement sequence. The teacher used these visuals to explain correct techniques more clearly than through verbal instruction alone. As a result, students were able to understand their mistakes and improve performance more effectively. The teacher reported increased confidence in assessment and better individual guidance, while students showed higher motivation and participation [7].

Case Study 2: Fitness Tracking and Data-Based Feedback in College Physical Education: In a college Physical Education programme, wearable fitness devices were used during regular fitness training sessions. These devices recorded heart rate, activity duration, and intensity levels. The teacher analyzed this data to design appropriate fitness activities and adjust workload according to students' physical capacity. This approach reduced reliance on subjective observation and improved accuracy in assessment. Students appreciated receiving objective feedback and felt more engaged in tracking their own progress. The teacher found that AI-supported data reduced manual work and improved lesson planning efficiency [7].

Case Study 3: Teacher Skill Development through Technology Integration: A group of Physical Education teachers participated in a short-term professional development programme focused on using digital and AI-supported teaching aids. Initially, teachers were hesitant due to limited technical knowledge. With guided practice and reflection, they gradually integrated tools such as performance-recording apps and digital feedback systems into their lessons. Teachers reported improvement in instructional clarity, classroom management, and confidence. The experience highlighted that technology enhanced teaching skills when combined with human judgment, decision-making, and reflective practice [7, 8].

Case Study 4: Policy-Guided Technology Use in Physical Education: In alignment with NEP 2020 guidelines, a school adopted technology-supported teaching methods in Physical Education. Teachers used digital demonstrations, performance records, and online resources to support holistic development. While AI tools assisted in organization and feedback, teachers remained central to motivation, safety, and ethical decision-making. The case showed that technology worked best as a supportive aid, allowing teachers to focus on mentorship, values, and overall student development [7].

7. Limitations

Despite the positive findings, the study had limitations. Many institutions lacked access to advanced AI tools, restricting teachers' opportunities to experiment with diverse technologies. Differences in digital literacy influenced how confidently teachers could integrate AI into their teaching. Additionally, as a qualitative study focusing on specific contexts, the findings may not be applied to all Physical Education settings [9].

8. Benefits of Artificial Intelligence

- Improves Skill Demonstration
- Enhances Observation Skills of Teachers
- Supports Fair and Accurate Assessment
- Strengthens Feedback Skills
- Encourages Individualized Teaching
- Improves Lesson Planning and Organization
- Builds Teacher's Confidence
- Promotes Reflective Teaching Practice
- Enhances Student's Engagement
- Aligns Teaching with Modern Education Polices

9. Recommendations

- Professional development programmes should include training on AI-based tools specific to Physical Education.
- Teacher education curricula need to integrate technology integration skills focused on practical subjects.
- Schools and colleges should invest in digital infrastructure and provide ongoing technical support.

- Policies must offer guidance on safe, ethical, and responsible use of AI in educational settings.

10. Conclusion

The study concludes that Artificial Intelligence has a positive effect on teachers' professional skills and the use of teaching aids in Physical Education. When teachers actively engage with AI tools, they develop greater instructional clarity, more objective assessment practices, and increased confidence in their professional roles. AI-supported teaching aids enable more accurate feedback and personalized instruction, enhancing overall teaching quality. However, successful integration depends on teacher training, infrastructure development, and supportive policy frameworks. With guided implementation and continuous professional development, AI can play a meaningful role in advancing Physical Education teaching and learning.

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