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IMPACT OF TECHNOLOGY-BASED PHYSICAL EDUCATION TOOLS ON STUDENT ENGAGEMENT AND LEARNING OUTCOMES

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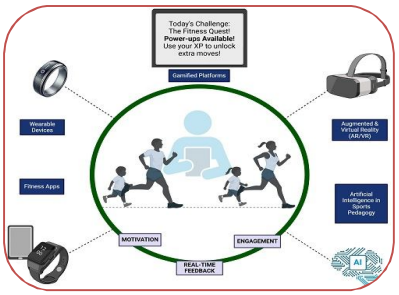
ABSTRACT

This research investigates the influence of technology-based physical education (PE) tools on student engagement and learning outcomes among secondary school students in Beed city. The study aims to assess how digital platforms, wearable fitness devices, and interactive software affect participation, motivation, and comprehension in PE classes. A sample of 100 students from five different schools was selected using random sampling. Results showed that students using tech-based PE tools exhibited higher engagement levels and improved cognitive understanding of physical fitness concepts compared to those who experienced traditional PE instruction.



KEYWORDS: *digital platforms , physical education (PE) , random sampling.*

INTRODUCTION

With the increasing integration of technology in all aspects of education, physical education too has witnessed the adoption of tools like fitness trackers, instructional videos, mobile apps, and online platforms. This shift aims to enhance student interest and bridge the gap between physical skills and theoretical knowledge. However, questions remain about its effectiveness in improving student learning outcomes and overall engagement.

NEED AND IMPORTANCE OF THE STUDY:

- Physical education often faces low engagement, especially in secondary schools.
- Traditional teaching may not resonate with tech-savvy students.
- There is a lack of research focused on how modern tools can transform PE delivery and outcomes.
- Findings could inform curriculum developers and educators to adopt modern methods.

OBJECTIVES OF THE STUDY:

1. To examine the effect of tech-based PE tools on student engagement.
2. To analyze learning outcomes in physical education through digital platforms.
3. To compare the engagement levels of students exposed to traditional and technology-based PE.
4. To assess student and teacher perceptions of technology in PE.
5. To offer recommendations for effective tech integration in school-level PE.

ASSUMPTIONS:

1. All participants have basic exposure to digital devices.
2. Schools provide access to technology used during the intervention.
3. Teachers are trained to use tech tools effectively.

HYPOTHESES:

- **H_0**: There is no significant impact of technology-based PE tools on student engagement and learning outcomes.
- **H_1**: Technology-based PE tools significantly improve student engagement and learning outcomes.

SCOPE AND LIMITATIONS:

Scope:

- Focused on students from selected secondary schools in Beed.
- Uses specific tools like fitness apps, smartwatches, and video tutorials.

Limitations:

- Limited sample size (100 students).
- Intervention duration of only 4 weeks.
- Variability in tech access among schools.

RESEARCH METHODOLOGY:

Research Method:

Quantitative research method with a quasi-experimental design.

Research Design:

- **Group A (Experimental):** Received PE instruction with technology tools.
- **Group B (Control):** Received traditional PE instruction.
- Pre- and post-tests were conducted for both groups.

Sampling:

- **Population:** Secondary school students from Beed city.
- **Sample Size:** 100 students (50 in Experimental, 50 in Control).
- **Sampling Technique:** Simple Random Sampling.

Tools and Techniques:

- Student Engagement Questionnaire (pre-validated).
- PE Learning Outcome Assessment (concepts + practical skills).
- Feedback form for teacher perception.
- Wearable fitness tracker data (steps, heart rate).
- Observation checklist.

Data Analysis:

Group	Mean Pre-Test Score	Mean Post-Test Score	Mean Gain	Standard Deviation
Control	62.4	65.1	2.7	4.2
Experimental	61.9	74.3	12.4	5.1

Statistical testing (t-test) showed significant improvement ($p < 0.01$) in the experimental group compared to the control group.

RESEARCH FINDINGS:

1. Experimental group students showed improved theoretical understanding of PE topics.
2. Use of fitness trackers and apps led to better tracking of goals and progress.
3. Student motivation and participation increased in the tech-enabled environment.
4. Teachers reported better classroom control and engagement with digital support.
5. Control group showed minimal improvement compared to the experimental group.

CONCLUSION:

Technology-based physical education tools significantly enhance student engagement and learning outcomes. Schools should consider integrating such tools to make PE more relevant, engaging, and educationally beneficial. Adequate teacher training and infrastructure development are necessary for long-term success.

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