International Journal of Sociologies and Anthropologies Science Reviews
Volume 5 Issue 3: May-June 2025: ISSN 2985-2730
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index

Utilizing Wearable Technology to Enhance Physical Education Teaching in Chinese High Schools

Zhang Zeyu[1], Suvachai Rittisom[2] and Prakit Hongseanyatham[3]
[1,2,3]Faculty of Sports Science and Technology, Bangkokthonburi University, Thailand
[1]E-mail: 2197753354@qq.com, ORCID ID: https://orcid.org/0009-0002-6418-7858
[2]E-mail: chaivasu5348@gmail.com, ORCID ID: https://orcid.org/0009-0006-6435-8804
[3]E-mail: prakitsport@gmail.com, ORCID ID: https://orcid.org/0009-0009-2196-0258

Received 21/09/2024 Revised 02/10/2024 Accepted 02/11/2024

Abstract

Background and Aim: In the context of the rapid development of smartphones and the Internet of Things (IoT), wearable technology, as an emerging field, has received increasing attention. These devices interact with the user's body through sensors, processors, and connectivity technologies, capable of collecting, analyzing, and transmitting various physiological signals and movement data in real-time. This enables personalized health monitoring, activity tracking, and virtual reality functions, presenting significant market potential and prospects. Therefore, this research aims to study the utilization of wearable technology to enhance physical education teaching in Chinese high schools.

Materials and Methods: This research was a mixed-methods study. The population consists of students from physical education classes across 3 high schools in Shanxi Province, and spans 3 grades: grade 10, grade 11, and grade 12, ensuring that each grade is equally represented within the study. Through a stratified sampling method, 18 classes were selected as the sample group, with each school contributing 6 classes, 2 classes from each of the grades 10, 11, and 12. Questionnaire surveys, observation, and interview methods were used to collect the data. In this research, descriptive statistical analysis, correlation analysis, and regression analysis were used to analyze the data.

Results: The research results showed that (1) the introduction of wearable technology into physical education significantly increases student engagement; (2) Wearable technology is positively correlated with improved performance in physical education; and (3) It have several barriers hinder the effective implementation of wearable technology, including the high cost of devices, technical difficulties, and a lack of adequate teacher training.

Conclusion: Wearable technology significantly improves student engagement and learning outcomes in high school physical education in Shanxi Province. Students who used wearable devices reported higher motivation and greater consistency in participation, particularly due to features like real-time feedback and gamification.

Keywords: Wearable Technology; Physical Education; High School

Introduction

With the continuous advancement of science and technology and the rapid development of society, the field of education is encountering new challenges and opportunities. One of the goals of education is to promote the comprehensive development of students, where physical education plays a crucial role in enhancing students' physical and mental health and their overall quality. However, traditional physical education teaching methods in high school face issues such as low student participation and poor teaching effectiveness, making the optimization of high school physical education to improve student engagement and teaching effectiveness an urgent issue to address (Yan, 2023).

In the context of the rapid development of smartphones and the Internet of Things (IoT), wearable technology, as an emerging field, has received increasing attention. By the end of 2023, the number of global smartphone users exceeded 3 billion, and the number of IoT devices reached tens of billions. Wearable technology, integrating with smartphones and IoT, encompasses a variety of smart devices worn on the body, such as smartwatches, smart glasses, and smart bracelets. These devices interact with the user's body through sensors, processors, and connectivity technologies, capable of collecting, analyzing, and transmitting various physiological signals and movement data in real-time. This enables personalized health monitoring, activity tracking, and virtual reality functions, presenting significant market potential and prospects (Gartner, 2016).

Developing education in the digital age is essential to meet the evolving needs of learners and to ensure broader access, flexibility, and security in learning. Nakunsong (2024) highlights the transformation of K–12 education through online learning and virtual programs, which enhance accessibility and

Citation
Zhang, Z., Rittisom, S., & Hongseanyatham, P. (2025). Utilizing Wearable Technology to Enhance Physical Education Teaching in Chinese High Schools. International Journal of Sociologies and Anthropologies Science Reviews, 5 (3), 77-86; DOI: https://doi.org/10.60027/ijsasr.2025.5788

adaptability for diverse student populations. Sisouvong and Pasanchay (2024) further emphasize the significance of mobile learning, enabling self-directed education that can take place anytime and anywhere, thus empowering learners with greater autonomy and continuous engagement. Additionally, Suktam et al. (2024) explore the use of blockchain technology in education, offering secure and transparent systems for learning records, credentialing, and academic data management. Collectively, these studies underline the importance of embracing technological advancements to create a more inclusive, efficient, and future-ready educational landscape.

However, the application of wearable technology in education, especially in physical education, remains relatively limited. Traditional high school physical education often emphasizes imparting knowledge and skills, lacking personalization and interactivity, which makes it challenging to meet the diverse learning needs of students. High school students, generally facing academic pressure and time constraints, tend to place less emphasis on physical education courses, resulting in insufficient participation. Additionally, traditional teaching methods rely mainly on teachers' subjective evaluations, lacking objective and quantifiable data support (Guo, 2023).

Therefore, researching how to integrate wearable technology into physical education and exploring its potential role in high schools is of great significance. This study aims to optimize physical education teaching in high schools using wearable technology, which, as an innovative teaching tool, offers portability, intelligence, and real-time monitoring capabilities. These features can effectively enhance student participation and teaching outcomes. The research will explore the application scenarios and advantages of wearable technology in physical education and empirically validate its feasibility and effectiveness in improving physical education in high schools (Yan, 2023). This study aims to provide innovative ideas and methods for physical education, promoting the comprehensive development and healthy growth among students (Ying, 2022).

The research problem centers on the urgent need to optimize physical education in high schools to address the challenges of low student engagement and ineffective teaching methods. Despite the increasing prevalence of wearable technology, which has the potential to enhance personalization and interactivity in education, its application within physical education remains limited. Traditional methods fail to accommodate the diverse needs of students, often relying on subjective evaluations that lack objective data support. Given the academic pressures faced by high school students, it is critical to explore how wearable technology can be integrated into physical education programs to foster greater participation and improve teaching effectiveness. This study aims to investigate the potential of wearable devices as innovative tools that can facilitate comprehensive student development and promote healthier lifestyles.

Research Objectives

To study the utilization of wearable technology to enhance physical education teaching in Chinese high schools.

Literature Review

Wearable technology

Wearable technology refers to electronic devices that can be worn on the body, often incorporating sensors and software to track various metrics related to health, fitness, and activity. Common examples include smartwatches, fitness trackers, and smart glasses. These devices typically collect data on physiological signals such as heart rate, steps taken, sleep patterns, and more, allowing users to monitor their health and fitness levels in real-time (Borowski-Beszta & Polasik, 2020).

Key features of wearable technology are as follows: (1) Health Monitoring: Track metrics like heart rate, blood pressure, and oxygen levels; (2) Fitness Tracking: Measure steps, distance, calories burned, and workout intensity; (3) Connectivity: Sync with smartphones or other devices for data analysis and notifications; (4) User Engagement: Provide feedback and insights to motivate users in achieving their fitness goals; (5) Integration with Apps: Work with various health and fitness applications to enhance user experience (Janssen & Draaijer, 2020).

Citation
Zhang, Z., Rittisom, S., & Hongseanyatham, P. (2025). Utilizing Wearable Technology to Enhance Physical Education Teaching in Chinese High Schools. International Journal of Sociologies and Anthropologies Science Reviews, 5 (3), 77-86; DOI: https://doi.org/10.60027/ijsasr.2025.5788

Wearable technology allows for real-time monitoring of various performance metrics, such as heart rate, calories burned, and movement patterns. This capability enables students to receive immediate feedback on their physical activities, which can enhance their understanding of fitness and encourage them to set and achieve personal health goals. For instance, students can use wearable devices to track their progress during a workout, receiving instant data on their performance that can help them make adjustments on the fly (Stevens & Hughes, 2020).

Wearable technology can transform physical education classes into interactive learning experiences. For example, augmented reality (AR) features in wearable devices can be used to create immersive sports simulations or to provide students with real-time guidance during physical activities. This interactivity can make physical education more dynamic and responsive to individual student needs. Additionally, students can engage in virtual fitness challenges with peers, promoting a sense of community and healthy competition. Wearable technology promotes health awareness by encouraging students to monitor and improve their physical fitness. By providing data on various health metrics, these devices can help students develop a better understanding of their bodies and the importance of maintaining a healthy lifestyle. This awareness can lead to long-term health benefits, as students carry these habits into adulthood. Furthermore, teachers can use the data collected from wearable devices to identify students who may be at risk of health issues, allowing for early intervention and support (Pedraza & Liu, 2019).

Wearable device

Wearable devices have seen rapid adoption due to their ability to monitor various physiological and activity-related metrics in real-time. Common types include fitness trackers, smartwatches, and health monitoring devices. These gadgets can measure heart rate, steps, sleep patterns, and even blood oxygen levels, among other metrics, offering users immediate feedback and personalized insights into their health and fitness.

In educational settings, especially in physical education, wearable devices enhance student engagement by providing instant feedback, setting goals, and tracking progress. Studies have shown that such devices promote student autonomy, improve physical fitness, and encourage self-monitoring. For example, fitness trackers allow students to see their heart rate in real-time during activities, motivating them to push their limits or maintain specific fitness zones.

In professional sports and training, wearables also play a crucial role by helping athletes and coaches make data-driven decisions on performance optimization, injury prevention, and recovery management. Devices can capture biomechanical data, such as movement patterns and force, which is useful for refining techniques and preventing overexertion (Yu, 2018).

However, financial constraints, particularly in underfunded schools or rural areas, limit the widespread implementation of these technologies. Wearable devices are also increasingly being integrated into healthcare systems for remote monitoring of chronic conditions like diabetes or cardiovascular diseases, reducing the need for frequent in-person consultations. Thus, wearable devices hold promise not just for improving individual health and fitness but also in reshaping educational and healthcare systems (Luo, 2022).

Liu et al. (2021) conducted a study that explored the impact of wearable devices on students' engagement in physical activities. The research revealed that the use of these devices, which provide real-time feedback on metrics such as heart rate, steps, and calories burned, significantly increased student motivation. By tracking their progress, students were more likely to participate actively in physical education classes. The immediate feedback helped students set personal goals, monitor their achievements, and adjust their efforts accordingly. This integration of technology into physical education made the learning experience more interactive and personalized, fostering a deeper interest in maintaining physical fitness.

Williams et al. (2020) found that the use of fitness trackers and smartwatches in physical education significantly enhanced student motivation by allowing them to set personalized goals and monitor their progress. This approach not only fostered self-regulation but also encouraged students to take ownership of their physical fitness. The study showed improvements in students' physical fitness levels and adherence to

Citation
Zhang, Z., Rittisom, S., & Hongseanyatham, P. (2025). Utilizing Wearable Technology to Enhance Physical Education Teaching in Chinese High Schools. International Journal of Sociologies and Anthropologies Science Reviews, 5 (3), 77-86; DOI: https://doi.org/10.60027/ijsasr.2025.5788

International Journal of Sociologies and Anthropologies Science Reviews
Volume 5 Issue 3: May-June 2025: ISSN 2985-2730
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index

fitness goals, highlighting that wearable technology can foster student autonomy. This aligns with broader findings that wearable devices support self-monitoring and increase active participation in physical education by making fitness both measurable and more engaging.

Wang and Chen (2021) explored how financial constraints, particularly in rural and underfunded schools, affect access to wearable devices, contributing to disparities in educational opportunities. The study pointed out that while wearable technology can enhance physical education through real-time feedback and personalized goal setting, many schools, especially in less affluent regions, struggle to implement such tools due to limited budgets. This finding is consistent with broader concerns about the digital divide in education. In Shanxi Province, schools cited cost as a major barrier to adopting wearable technology on a large scale, which restricts the potential benefits of these devices for student engagement and physical fitness.

Hu and Zhang (2023) explored the potential of wearable technology in enhancing interdisciplinary learning, particularly in subjects like science. They discussed how students could use wearable devices to monitor physiological responses, such as heart rate, body temperature, or stress levels, during experiments. This approach not only makes science more interactive but also allows students to visualize and analyze real-time data, promoting a deeper understanding of scientific principles. The integration of such technology helps bridge the gap between theoretical knowledge and practical application, making learning more immersive and personalized.

Summary

The literature reviewed in this chapter demonstrates the growing interest in wearable technology as a tool for enhancing educational outcomes. The integration of wearable devices into physical education and other areas of the curriculum has been shown to increase student engagement, improve health and fitness, and support personalized learning. However, the research also highlights several challenges that must be addressed to fully realize the potential of wearable technology in education, including issues related to cost, accessibility, teacher training, and data privacy. In China, the use of wearable technology in education is still in its nascent stages, with much of the current research focusing on pilot programs and small-scale studies.

Conceptual Framework

The conceptual framework for this research is as follows:

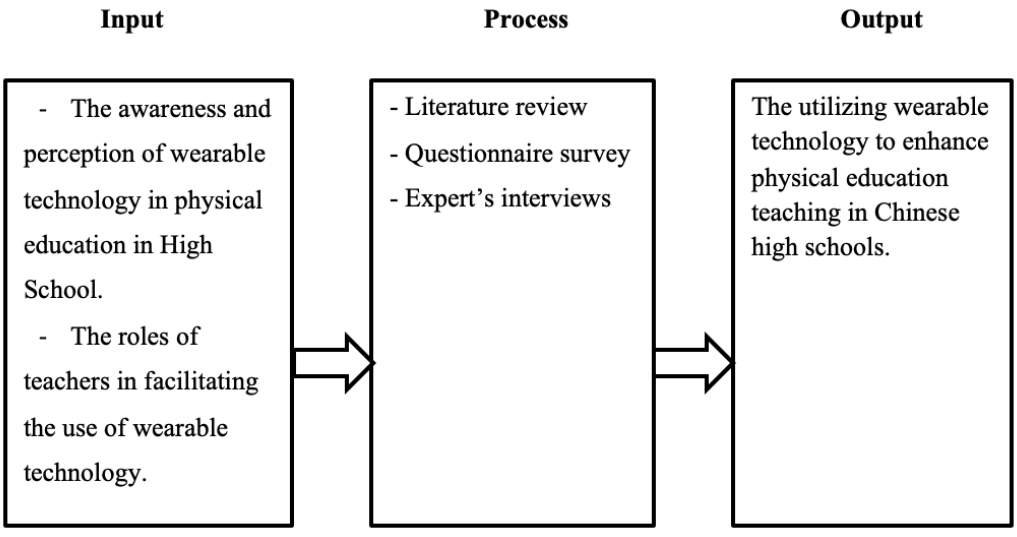

Figure 1 Conceptual framework

Citation
Zhang, Z., Rittisom, S., & Hongseanyatham, P. (2025). Utilizing Wearable Technology to Enhance Physical Education Teaching in Chinese High Schools. International Journal of Sociologies and Anthropologies Science Reviews, 5 (3), 77-86; DOI: https://doi.org/10.60027/ijsasr.2025.5788

International Journal of Sociologies and Anthropologies Science Reviews
Volume 5 Issue 3: May-June 2025: ISSN 2985-2730
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index

Methodology

1. Research Tools

In this research, the research tools are as follows:

1.1 Questionnaire for students
1.2 Questionnaire for the teacher
1.3 Observation Record
1.4 Interviewing form

2. Population and Sample

Population specifications and sizes

The research population consists of students from physical education classes across 3 high schools in Shanxi Province. The population spans 3 grades: grade 10, grade 11, and grade 12, ensuring that each grade is equally represented within the study.

Sample

From the identified high schools, a stratified sampling technique was applied to choose a representative sample. This resulted in 18 classes being selected as the study sample, with each school contributing six classes, two from each of the grades 10, 11, and 12.

3. Data Collection

Questionnaire Surveys

Process: The initial step in data collection involved distributing questionnaire surveys to the intended subjects, encompassing both students and teachers. These surveys were carefully designed to include a mix of multiple-choice and open-ended questions, aiming to capture a broad spectrum of perceptions and attitudes.

Scale and Response Rate: A total of 714 questionnaires were distributed. After careful collection and screening for completeness and relevance, 607 valid responses were identified, marking an 85% response rate.

Reliability Testing: Before the formal survey distribution, the questionnaire underwent a two-phase testing process to ensure its effectiveness and reliability. This involved pilot testing with 50 students and 10 teachers, followed by reliability testing through repeated administration to the same group, achieving a Cronbach's alpha coefficient of 0.8, indicating high reliability.

Observational Records

Process: The research team conducted detailed on-site observations across various high schools to study students' interactions with wearable technology. This phase focused on understanding usage patterns across 18 different teaching classes.

Documentation Method: To enhance the objectivity and accuracy of the observations, video recording equipment was utilized, allowing for precise documentation and facilitating thorough analysis of the usage patterns.

Interviews

Format and Participants: In-depth, semi-structured interviews were conducted to gain further insights into the experiences and viewpoints of both teachers and a selected group of students regarding wearable technology in educational settings. A total of 30 interviews were conducted, including 10 with teachers and 20 with students.

Objective: These interviews aimed to complement the quantitative data from surveys and observations with qualitative insights, providing a more nuanced understanding of the impact and perceptions of wearable technology in education.

This structured approach ensures that each method of data collection is clearly defined and organized according to its sequence in the research process, highlighting the methodologies, scale, and specific objectives of each stage.

4. Data Analysis

In this study, the following statistical methods were used to analyze the application of wearable technology in physical education:

Citation
Zhang, Z., Rittisom, S., & Hongseanyatham, P. (2025). Utilizing Wearable Technology to Enhance Physical Education Teaching in Chinese High Schools. International Journal of Sociologies and Anthropologies Science Reviews, 5 (3), 77-86; DOI: https://doi.org/10.60027/ijsasr.2025.5788

1. Descriptive Statistical Analysis: Provided an overview of the sample, covering aspects like gender, grade level, and physical education performance of students.
2. Correlation Analysis: Explored the relationship between the use of wearable technology and students' physical education performance.
3. Regression Analysis: Examined how wearable technology predicts students' physical education performance, considering factors like grade level and gender.

Results

1. Questionnaire survey results

1.1. The current situation of the participation in physical activity of high school students

Table 1 Average Physical Activity Duration by Grade

Grade	Average Duration (minutes)
Grade 10	60
Grade 11	50
Grade 12	45

Based on Table 1, the duration of physical activity decreases as students' progress from Grade 10 to Grade 12, with the most significant reduction observed in Grade 12, likely due to increased academic demands related to college entrance exam preparation. This trend highlights a growing concern in Chinese education, where academic pressure negatively impacts students' engagement in physical activities. The decrease in activity can be attributed to the increased academic workload, especially in Grade 12, where students are more focused on their academic performance. This reduction can be counteracted by integrating wearable technology to make physical activities more efficient and engaging.

1.2 The awareness of wearable technology among high school students

Table 2 Awareness of wearable technology

Category	**Percentage/Value**
Gender (Male)	51%
Gender (Female)	49%
Awareness of Wearable Tech	85%
Average Physical Activity Duration	50 minutes

Based on Table 2, the sample was evenly balanced between male and female students, allowing for a comprehensive analysis across genders. With 85% awareness, wearable technology is well recognized among students, suggesting a readiness for its integration into physical education. For activity duration, students participated in 50 minutes of physical activity per session on average, indicating moderate engagement.

1.3 Wearable device usage by high school students

Citation
Zhang, Z., Rittisom, S., & Hongseanyatham, P. (2025). Utilizing Wearable Technology to Enhance Physical Education Teaching in Chinese High Schools. International Journal of Sociologies and Anthropologies Science Reviews, 5 (3), 77-86; DOI: https://doi.org/10.60027/ijsasr.2025.5788

International Journal of Sociologies and Anthropologies Science Reviews
Volume 5 Issue 3: May-June 2025: ISSN 2985-2730
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index

Table 3 Popularity of Wearable Devices

Device Type	Percentage of Usage
Smart Wristbands	40%
Smartwatches	30%
Smart Glasses	10%
Smart Shoes	10%
Earphones	10%

Based on Table 3, smart wristbands and smartwatches dominate the wearable technology landscape among students. These devices offer essential features such as fitness tracking, heart rate monitoring, and affordability, making them more accessible to students and schools. Other devices, such as smart glasses and shoes, see limited usage, reflecting their higher cost and fewer practical applications in the context of physical education.

1.4 The relationship between wearable technology usage and student performance in physical education

Table 4 Correlation between Wearable Technology Usage and Physical Education Performance

Metric	Result
Correlation Coefficient	+0.78
Regression Coefficient	+0.65
Statistical Significance	$p < 0.01$

Based on Table 4, there is a strong positive correlation (+0.78) between the use of wearable technology and improved physical education performance. The regression coefficient (+0.65) also demonstrates that wearable technology significantly predicts better physical education outcomes, with these results being statistically significant ($p < 0.01$). Wearable technology's ability to provide real-time feedback and monitor progress encourages students to maintain higher levels of engagement, which translates into better physical education performance.

2. Expert's interview results

Citation
Zhang, Z., Rittisom, S., & Hongseanyatham, P. (2025). Utilizing Wearable Technology to Enhance Physical Education Teaching in Chinese High Schools. International Journal of Sociologies and Anthropologies Science Reviews, 5 (3), 77-86; DOI: https://doi.org/10.60027/ijsasr.2025.5788

International Journal of Sociologies and Anthropologies Science Reviews
Volume 5 Issue 3: May-June 2025: ISSN 2985-2730
Website: https://so07.tci-thaijo.org/index.php/IJSASR/index

Table 5 Qualitative analysis

Theme	Description
Increased Interactivity and Personalization	Wearable technology enhances real-time feedback and customization of physical education.
Challenges and Barriers	High costs, technical issues, and insufficient teacher training were commonly noted challenges.
Perceived Impact on Motivation	Students reported higher motivation levels, particularly in goal-oriented activities.

Based on Table 5, the qualitative analysis identified three main themes: interactivity, challenges, and motivation. Students felt that wearable technology improved the interactivity of their lessons, while teachers noted that the lack of training and high device costs were significant barriers. Motivation was a recurring theme, with many students indicating that real-time feedback and progress tracking helped them set and achieve personal fitness goals. Schools should focus on providing adequate teacher training and securing funding to ensure that wearable technology can be implemented effectively. Government programs could also subsidize device costs for schools in lower-income areas.

3. Observation results

Observational data provided insights into how students interacted with wearable technology during physical education.

Table 6 Students' interaction with wearable technology

Activity Type	Engagement Level
Endurance Exercises (e.g., running)	High
Strength Training	Moderate
Flexibility Exercises	Low

Based on Table 6, high engagement in endurance activities, students were most engaged in activities where wearable devices provided real-time metrics, such as running. Lower engagement in flexibility exercises, these activities saw less engagement, potentially due to fewer wearable tech applications relevant to flexibility.

Conclusion

This study provides a comprehensive examination of the application and impact of wearable technology on high school physical education in Shanxi Province, China. The findings highlight the potential of wearable technology to revolutionize physical education by enhancing student engagement, motivation, and learning outcomes. However, the research also underscores the need to address significant challenges, such as the cost of devices, technical issues, and the necessity of proper teacher training, to fully leverage the benefits of this technology.

Citation
Zhang, Z., Rittisom, S., & Hongseanyatham, P. (2025). Utilizing Wearable Technology to Enhance Physical Education Teaching in Chinese High Schools. International Journal of Sociologies and Anthropologies Science Reviews, 5 (3), 77-86; DOI: https://doi.org/10.60027/ijsasr.2025.5788

Discussion

The findings of this study reveal that wearable technology significantly improves student engagement and learning outcomes in high school physical education in Shanxi Province. Students who used wearable devices reported higher motivation and greater consistency in participation, particularly due to features like real-time feedback and gamification. This mirrors the conclusions of Liu et al. (2021), who similarly found that wearable devices made physical activities more engaging for students by providing immediate feedback and allowing students to track their progress.

Furthermore, Williams et al. (2020) noted that fitness trackers and smartwatches enhanced student motivation in physical education through goal setting and progress tracking. This aligns with the improvements in students' physical fitness and goal adherence observed in this study, reinforcing the idea that wearable technology fosters student autonomy and self-monitoring, thereby encouraging more active participation in physical education.

Although wearable technology presents significant benefits, several barriers hinder its implementation in physical education, particularly in Shanxi Province. The most notable challenge is the high cost of wearable devices. As identified by Wang and Chen (2021), financial constraints, particularly in rural and underfunded schools, limit access to these devices, creating disparities in educational opportunities. This study's findings are consistent with this observation, as many schools in Shanxi Province cited cost as a major obstacle to implementing wearable technology on a wide scale.

The findings of this study suggest that the integration of wearable technology in physical education has broader implications for the education system as a whole. Wearable devices offer a valuable tool for promoting personalized learning, a concept that extends beyond physical education. For instance, Hu and Zhang (2023) discuss how wearable technology can be integrated into subjects like science, where students can monitor their physiological responses during experiments. This cross-disciplinary potential opens up new possibilities for enhancing student engagement and learning across a wide range of subjects.

Recommendation

Recommendation for this research

1. Schools should invest in training programs for teachers that cover both the technical aspects of wearable technology and pedagogical strategies for integrating these tools into physical education.
2. Schools should establish collaborative learning communities where teachers can share experiences, challenges, and best practices related to the use of wearable technology.
3. Encouraging students to take the lead in setting fitness goals and using wearable technology to track their progress can enhance motivation and accountability.

Recommendation for further research

1. Establish comprehensive data privacy policies that govern the collection, storage, and use of data from wearable devices.
2. Develop standards for the implementation of wearable technology in schools, including guidelines on device selection, teacher training, and student engagement.
3. Future research should focus on long-term studies that track the impact of wearable technology on student engagement, motivation, and learning outcomes over several years.
4. Comparative studies should be conducted across schools with varying levels of resources, infrastructure, and student demographics.

Reference

Borowski-Beszta, M., & Polasik, M. (2020). Wearable devices: New quality in sports and finance. *Physical Education and Sport, 150*, 1077-1084.

Gartner. (2016). *Forecast: Wearable Electronic Devices, Worldwide, 2016*. Retrieved from https://www.gartner.com/en/documents/123456

Guo, Y. Q. (2023). *Research on the construction and operating mechanism of the smart fitness ecosystem among Chinese university students*. Master's degree thesis, Shandong University.

Citation
Zhang, Z., Rittisom, S., & Hongseanyatham, P. (2025). Utilizing Wearable Technology to Enhance Physical Education Teaching in Chinese High Schools. International Journal of Sociologies and Anthropologies Science Reviews, 5 (3), 77-86; DOI: https://doi.org/10.60027/ijsasr.2025.5788

Hu, J., & Zhang, L. (2023). Integrating wearable technology into science education: Enhancing student engagement through real-time physiological data. *Journal of Science Education and Technology*, 32(2), 245-259.

Janssen, J., & Draaijer, S. (2020). Wearable technology for student engagement: The role of real-time feedback in educational contexts. *Journal of Learning Analytics, 7*(3), 67-83.

Liu, Y., Gao, Z., & Lee, J. E. (2021). The effect of wearable devices on engaging students in physical education and physical activity. *Journal of Teaching in Physical Education*, 40(1), 75-85.

Luo, J. (2022). *Research on the application of smart wearable devices among college students in physical exercise*. [Master's degree thesis]. Harbin Normal University.

Nakunsong, T. (2024). Evolving K-12 Digital Education: Enhancing Flexibility and Access through Online Learning and Virtual Programs. *Journal of Education and Learning Reviews, 1*(5), 1–12. https://doi.org/10.60027/jelr.2024.791

Pedraza, J. M., & Liu, Y. (2019). Wearable technology in physical education: Applications and impacts on student engagement. *Journal of Educational Research and Practice, 9*(4), 122-139.

Sisouvong , V. ., & Pasanchay, K. . (2024). Mobile Learning: Enhancing Self-Directed Education through Technology, Wireless Networks, and the Internet Anytime, Anywhere. *Journal of Education and Learning Reviews, 1*(2), 39–50. https://doi.org/10.60027/jelr.2024.752

Stevens, M., & Hughes, J. (2020). Bridging the gap: Wearable technology and student learning in physical education. *Advances in Physical Education, 10*(3), 233-245.

Suktam, W., Lapchit, S., Supsin, J., Sonwa, S., & Suthamdee, C. (2024). Blockchain in Education: Transforming Learning, Credentialing, and Academic Data Management. *Journal of Education and Learning Reviews, 1*(6), 37–46. https://doi.org/10.60027/jelr.2024.739

Wang, Y., & Chen, H. (2021). Financial barriers to integrating wearable technology in education: A case study of rural schools in China. *Educational Technology Research and Development*, 69(4), 1059-1072.

Williams, R., Smith, L., & Jones, M. (2020). The impact of wearable technology on student motivation and engagement in physical education. *Journal of Physical Education, Recreation & Dance*, 91(5), 45-53

Yan, H. W. (2023). *Research on the development strategy of campus running in Shanxi Province universities based on the SWOT-AHP model*. Master's degree thesis. Shanxi University.

Ying, H. R. (2022). *Research on the user needs and usage behavior of fitness-related apps among college students in Henan Province universities*. Master's degree thesis, Henan University.

Yu, H. L. (2018). *A survey on the use of smart wearable devices in physical fitness among non-physical education major college students in Changchun*. Master's degree thesis, Northeast Normal University.

Citation
Zhang, Z., Rittisom, S., & Hongseanyatham, P. (2025). Utilizing Wearable Technology to Enhance Physical Education Teaching in Chinese High Schools. International Journal of Sociologies and Anthropologies Science Reviews, 5 (3), 77-86; DOI: **https://doi.org/10.60027/ijsasr.2025.5788**