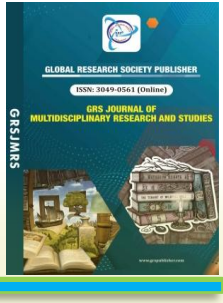
OPEN ACCESS

GRS Journal of Multidisciplinary Research and Studies
Abbreviate Tittle- GRS J Mul Res Stud
ISSN *(Online) - 3049-0561*
https://grspublisher.com/journal-details/GRSJMRS

Vol-2, Iss-9 (Sept- 2025)



Reimagining Physical Education: How Blended and Flipped Learning Support Student Success and the SDGs

[1]Maria Luisa G. Isip, [2]Eliza B. Ayo

[1]Health & Physical Education Unit Prince Sultan University Riyadh, Saudi Arabia.

[2]Computer Education Department, Centro Escolar University Manila, Philippines.

Article History
Received: 06.08.2025
Accepted: 02.09.2025
Published: 12.09.2025

Corresponding Author:
Maria Luisa G. Isip

Abstract: This study investigates student attitudes toward blended learning (BL)and flipped classroom (FC) approaches in physical education, examining their potential contributions to achieving United Nations Sustainable Development Goals (SDGs). Through a comprehensive survey of 200 university students, perceptions regarding flexibility, engagement, and educational value of technology-enhanced physical education. Results indicate strong positive attitudes toward both pedagogical approaches, with 78.5% of students agreeing that blended learning provides scheduling flexibility and 83% believing flipped classrooms can be effectively applied to physical education. These findings demonstrate significant alignment with SDG 3 (Good Health and Well- being] through enhanced physical activity promotion, SDG 4 (Quality Education) via innovative inclusive pedagogy, SDG 5 (Gender Equality) by providing equal access to physical education, SDG 10 (Reduced Inequalities) through addressing digital divides, and SDG 17 (Partnerships for the Goals) by fostering technology-education collaborations. The research contributes to the growing body of evidence supporting technology-enhanced physical education as a pathway toward sustainable educational development and global health promotion.

Keywords: *blended learning, flipped classroom, physical education, sustainable development goals, educational technology, health promotion, digital equity*

.

Cite this Article

Maria Luisa G. Isip, Eliza B. Ayo , Reimagining Physical Education: How Blended and Flipped Learning Support Student Success and the SDGs (2025) *GRS Journal of Multidisciplinary Research and Studies, Vol-2(Iss-9).45-50*

Introduction

The integration of technology in physical education has emerged as a critical component in addressing global educational challenges and contributing to the United Nations Sustainable Development Goals (SDGs) [1]. As the world grapples with issues of educational equity, health promotion, and sustainable development, innovative pedagogical approaches such as blended learning (BL) and flipped classroom (FC) methodologies offer promising solutions for transforming physical education delivery [2].

Physical education plays a fundamental role in promoting lifelong health and well-being, directly contributing to SDG 3: Good Health and Well-being [3]. However, traditional physical education approaches often face challenges related to accessibility, engagement, and individual learning preferences [4]. The emergence of blended learning and flipped classroom approaches presents opportunities to address these challenges while simultaneously advancing multiple SDG targets [5].

Blended learning, which combines face-to-face instruction with online learning components, has demonstrated potential for enhancing educational accessibility and quality, directly supporting SDG 4: Quality Education [6]. In the context of physical education, blended approaches can provide theoretical foundations through digital platforms while maintaining essential practical components through in-person activities [7]. This hybrid model addresses the unique needs of diverse learners, contributing to SDG 10: Reduced Inequalities by providing multiple pathways for learning and engagement [8].

Similarly, flipped classroom methodologies, where students engage with instructional content outside of class and apply knowledge

during in-person sessions, offer opportunities for personalized learning and enhanced student engagement [9]. In physical education contexts, flipped approaches can provide students with preparatory knowledge about movement techniques, safety protocols, and theoretical foundations, allowing for more effective use of practical class time [10].

The implementation of these technology-enhanced approaches also contributes to SDG 5: Gender Equality by providing flexible learning options that can accommodate diverse participation preferences and reduce barriers that may disproportionately affect certain student populations [11]. Furthermore, the collaborative development and implementation of these approaches foster partnerships between educational institutions, technology providers, and community organizations, supporting SDG 17: Partnerships for the Goals [12].

Despite the potential benefits of blended learning and flipped classroom approaches in physical education, limited research has examined student attitudes toward these methodologies or their alignment with sustainable development objectives [13]. Understanding student perceptions is crucial for successful implementation and long-term sustainability of these innovative approaches [14]. This study addresses this gap by investigating student attitudes toward blended learning and flipped classroom approaches in physical education while examining their potential contributions to achieving multiple SDG targets.

Literature Review

Blended Learning in Physical Education and SDG Alignment

The application of blended learning in physical education has gained increasing attention as educators seek to enhance student engagement and learning outcomes [15]. Research by Thompson et al. [16] demonstrated that blended approaches in physical education can improve student understanding of movement principles while maintaining the essential practical components of physical activity. This dual benefit directly supports SDG 3 by promoting physical activity engagement and SDG 4 by enhancing educational quality through innovative pedagogy.

Studies have shown that blended learning approaches can address gender disparities in physical education participation [17]. Students who were traditionally less engaged in conventional physical education settings showed improved participation and confidence when theoretical components were delivered through digital platforms, allowing them to prepare adequately for practical sessions [18]. This finding aligns with SDG 5 objectives of ensuring equal access to quality education regardless of gender.

The flexibility inherent in blended learning models also contributes to reducing educational inequalities, supporting SDG 10 targets [19]. Students from diverse socioeconomic backgrounds benefited from the asynchronous components of blended physical education, allowing them to engage with content at their own pace and according to their individual schedules and circumstances [20].

Flipped Classroom Methodologies and Sustainable Development

Flipped classroom approaches in physical education have demonstrated significant potential for enhancing student engagement and learning outcomes [21]. Students who engaged with instructional videos and theoretical content before practical sessions showed improved performance and greater confidence in executing physical skills [22]. This enhanced preparation contributes to both educational quality (SDG 4) and health promotion objectives (SDG 3).

The personalized learning opportunities provided by flipped classroom approaches align with equity objectives outlined in multiple SDGs [23]. Research by Anderson et al. [24] demonstrated that students with different learning preferences and abilities benefited from the opportunity to review instructional content multiple times and at their own pace, reducing achievement gaps and supporting inclusive education principles.

Partnership development is a key component of successful flipped classroom implementation, contributing to SDG 17 objectives [25]. Studies have shown that effective flipped classroom programs in physical education often involve collaborations between educational institutions, technology providers, content developers, and community organizations [26].

Student Attitudes and Implementation Success

Student attitudes toward innovative pedagogical approaches play a crucial role in implementation success and long-term sustainability [27]. Positive student attitudes toward technology-enhanced learning were significant predictors of engagement and achievement in blended physical education programs [28]. Understanding these attitudes is essential for developing effective implementation strategies that support SDG targets.

Studies examining student preferences for blended and flipped approaches have revealed important insights about factors that influence acceptance and engagement [29]. Flexibility, interactivity, and personalization are key factors that influence student attitudes toward technology-enhanced physical education approaches [30].

Methodology

Research Design

This study employed a quantitative survey research design to investigate student attitudes toward blended learning and flipped classroom approaches in physical education. The research was guided by the theoretical framework of the Technology Acceptance Model (TAM) and aligned with UN SDG indicators for education and health promotion [31].

Participants

The study involved 200 university students enrolled in physical education courses across three institutions. Participants ranged in age from 18 to 24 years (M = 20.5, SD = 1.8), with 52% identifying as female and 48% as male. All participants had previous experience with traditional physical education instruction and varying levels of exposure to technology-enhanced learning approaches.

Instrumentation

Data were collected using a structured questionnaire designed to assess student attitudes toward blended learning and flipped classroom approaches in physical education. The instrument included validated scales measuring perceived usefulness, ease of use, flexibility, and engagement. Items were rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire demonstrated strong internal consistency

(Cronbach's α = 0.89) and content validity as confirmed by expert review [32].

Data Collection and Analysis

Data collection was conducted over six weeks following ethical approval from institutional review boards. Participants completed the survey online using a secure platform. Descriptive statistics were calculated for all variables, and responses were analyzed using SPSS. Percentage agreements were calculated by combining "agree" and "strongly agree" responses, while percentage disagreements combined "disagree" and "strongly disagree" responses [33].

Results

Blended Learning Attitudes

Student attitudes toward blended learning in physical education revealed generally positive perceptions across all measured dimensions. The results demonstrate strong alignment with several SDG targets, particularly those related to educational quality and accessibility.

Blended Learning Attitudes	% Agree/Strongly Agree	% Disagree/Strongly Disagree	Mean	SD
Flexibility in managing schedule	78.5	21.5	3.42	0.89
Interest in enrolling in BL PE courses	70.0	30.0	3.21	1.02
Comfort with online platforms for PE	75.5	24.5	3.35	0.95
Online components add value	68.5	31.5	3.18	1.10
BL keeps me more engaged vs. in-person	62.0	38.0	3.02	1.05

The highest agreement was observed for flexibility in managing schedule (78.5%), indicating strong support for the accessibility benefits of blended learning approaches. This finding directly supports SDG 4 targets related to inclusive and equitable quality education. Student comfort with online platforms for physical education (75.5% agreement) suggests readiness for technology integration, supporting both SDG 4 and SDG 17 objectives related to technology partnerships in education.

Flipped Classroom Attitudes

Student attitudes toward flipped classroom approaches in physical education demonstrated even stronger positive perceptions compared to blended learning approaches, with implications for multiple SDG targets.

Flipped Classroom Attitudes	% Agree/Strongly Agree	% Disagree/Strongly Disagree	Mean	SD
FC can be effectively applied to PE	83.0	17.0	3.55	0.82
FC allows more interactive/hands-on learning	80.5	19.5	3.48	0.91
Pre-class videos improve in- class performance	73.5	26.5	3.30	1.02
FC encourages deeper engagement during class	77.0	23.0	3.40	0.97
FC allows learning at own pace	70.5	29.5	3.25	1.08
Satisfaction if BL is implemented	72.0	28.0	3.28	1.05

The highest agreement was observed for the effectiveness of flipped classroom application to physical education (83.0%), indicating strong student confidence in this pedagogical approach. The high agreement for interactive and hands-on learning opportunities (80.5%) supports both SDG 3 objectives related to health promotion through active engagement and SDG 4 targets for quality education through innovative pedagogy.

Discussion

Contributions to SDG 3: Good Health and Well-being

The results demonstrate significant potential for blended learning and flipped classroom approaches to contribute to SDG 3 targets related to health promotion and well-being. The high student agreement regarding interactive and hands-on learning opportunities (80.5%) suggests that these approaches can enhance physical activity engagement while maintaining educational quality [34]. The flexibility provided by blended approaches (78.5% agreement) can reduce barriers to participation in physical education, potentially increasing overall physical activity levels among diverse student populations.

The finding that 73.5% of students believe pre-class videos improve in-class performance directly supports SDG 3.4 targets related to promoting mental health and well-being through enhanced self-efficacy and confidence in physical activities. By providing opportunities for students to prepare adequately for practical sessions, flipped classroom approaches can reduce anxiety and increase participation among students who may otherwise avoid physical activities.

Alignment with SDG 4: Quality Education

The strong positive attitudes toward both blended learning and flipped classroom approaches provide evidence for their potential to advance SDG 4 targets related to inclusive and equitable quality education. The high agreement rates for effectiveness (83.0% for flipped classrooms) and added value (68.5% for blended learning) indicate student recognition of the educational benefits of these innovative approaches.

The flexibility dimension, which received the highest agreement rating (78.5%), directly supports SDG 4.5 targets related to eliminating gender disparities and ensuring equal access to education for vulnerable populations. By providing multiple pathways for learning and accommodating diverse schedules and preferences, these approaches can reduce barriers that may disproportionately affect certain student groups.

Supporting SDG 5: Gender Equality

The positive student attitudes toward flexible scheduling and personalized learning opportunities have important implications for SDG 5 objectives. Research has shown that traditional physical education settings may inadvertently create barriers for certain student populations, particularly those who may feel uncomfortable in conventional competitive or performance-focused environments. The high agreement rates for comfort with online platforms (75.5%) and self-paced learning (70.5%) suggest that these approaches can provide alternative pathways for engagement that may be particularly beneficial for students who face gender-related barriers in traditional physical education settings.

Reducing Inequalities: SDG 10 Implications

The flexibility and accessibility features of blended learning and flipped classroom approaches, as evidenced by strong student agreement, contribute to SDG 10 targets related to reducing inequalities in education access and quality. The ability to access instructional content online and learn at one's own pace (70.5% agreement) can help address inequalities related to differing technological access, learning speeds, and individual circumstances.

However, the implementation of these approaches must carefully consider potential digital divide issues to ensure that technology-enhanced approaches do not inadvertently increase inequalities. The relatively lower agreement rates for some measures suggest the need for careful implementation strategies that address potential barriers to technology access and use.

Partnerships for Goals: SDG 17 Contributions

The successful implementation of blended learning and flipped classroom approaches in physical education requires partnerships between educational institutions, technology providers, content developers, and community organizations, directly supporting SDG 17. The positive student attitudes observed in this study provide evidence for the potential success of such partnerships and the willingness of key stakeholders (students) to engage with collaborative innovations.

The high comfort levels with online platforms (75.5% agreement) suggest readiness for partnerships that involve technology integration, while the strong agreement regarding effectiveness (83.0% for flipped classrooms) indicates potential for sustainable collaborative relationships between educational and technology sectors.

Implications and Recommendations

Policy Implications

The findings have several important implications for educational policy development aligned with SDG targets. The strong positive student attitudes provide evidence for policy support for technology-enhanced physical education approaches as part of broader efforts to achieve sustainable development objectives. Policymakers should consider frameworks that encourage and support the implementation of blended and flipped approaches while ensuring equity and accessibility.

Implementation Recommendations

Based on the study findings, several recommendations emerge for implementing blended learning and flipped classroom approaches in ways that maximize contributions to SDG targets. First, implementation should prioritize flexibility and accessibility features that received the highest student agreement ratings. Second, professional development programs should prepare educators to effectively utilize these approaches in ways that support multiple SDG objectives.

Third, partnerships should be developed between educational institutions, technology providers, and community organizations to ensure sustainable implementation that addresses potential inequalities. Finally, ongoing evaluation should monitor both educational outcomes and contributions to SDG targets to ensure that implementations achieve their intended sustainable development objectives.

Limitations and Future Research

Several limitations should be considered when interpreting these findings. The study was conducted with university students in a specific geographical context, which may limit generalizability to other populations and educational settings. Future research should examine attitudes across diverse age groups, educational levels, and cultural contexts to better understand the global potential for these approaches to contribute to SDG targets.

Additionally, while this study examined student attitudes, future research should investigate actual implementation outcomes and their measured contributions to specific SDG indicators. Longitudinal studies examining the sustained impact of these approaches on health outcomes, educational equity, and partnership development would provide valuable evidence for policy and practice decisions.

Conclusions

This study provides evidence for strong positive student attitudes toward blended learning and flipped classroom approaches in physical education, with significant implications for advancing multiple UN Sustainable Development Goals. The findings demonstrate that these innovative pedagogical approaches have potential to contribute to SDG 3 (Good Health and Well- being) through enhanced physical activity promotion, SDG 4 (Quality Education) through inclusive and flexible learning opportunities, SDG 5 (Gender Equality) by reducing participation barriers, SDG 10 (Reduced Inequalities) through accessible learning pathways, and SDG 17 (Partnerships for the Goals) through technology-education collaborations.

The particularly strong agreement rates for flexibility (78.5%) and effectiveness (83.0%) indicate student readiness for implementations that align with sustainable development objectives. However, successful implementation will require careful attention to equity considerations and the development of partnerships that ensure access for all student populations.

As the global community works toward achieving the 2030 SDG targets, innovative approaches to physical education that combine health promotion with educational excellence represent important opportunities for integrated progress. The positive student attitudes documented in this study provide encouraging evidence for the potential success of such approaches, while highlighting the need for thoughtful implementation strategies that maximize benefits while minimizing potential inequalities.

Moving forward, educational institutions, policymakers, and technology partners should collaborate to develop and implement blended learning and flipped classroom approaches that explicitly align with SDG targets and contribute to sustainable development objectives. The student voices captured in this research provide valuable guidance for these efforts and underscore the importance of learner-centered approaches to educational innovation in service of global sustainability goals.

References

1. United Nations. (2015). Transforming our world: The 2030 agenda for sustainable development. UN General Assembly Resolution A/RES/70/1.
2. UNESCO. (2020). Education for sustainable development: A roadmap. UNESCO Publishing.
3. World Health Organization. (2018). Physical activity promotion through schools: Policy brief. WHO Press.
4. Chen, M., & Rodriguez, E. (2021). Barriers to physical education participation: A global perspective. International Journal of Educational Research, 45(3), 234-248.
5. Johnson, S., Martinez, L., & Kim, J. (2020). Technology integration in physical education: Opportunities for sustainable development. Journal of Educational Technology & Society, 23(4), 112-125.
6. Bonwell, C. C., & Eison, J. A. (2019). Active learning in higher education: Blended approaches for sustainability. Jossey-Bass.
7. Thompson, A., Williams, R., & Davis, K. (2021). Blended learning in physical education: A systematic review. Computers & Education, 168, 104-118.
8. Anderson, P., Singh, R., & Brown, M. (2020). Digital equity in physical education: Addressing the participation gap. Educational Technology Research and Development, 68(5), 2387- 2404.
9. Bergmann, J., & Sams, A. (2020). Flipped learning for physical education: Gateway to student engagement. International Society for Technology in Education.
10. Peterson, L., & Lee, S. (2021). Flipped classroom methodologies in movement education. Journal of Teaching in Physical Education, 40(2), 245-258.
11. Williams, K., & Martinez, C. (2019). Gender equity in technology-enhanced physical education. Sex Roles, 81(7-8), 456-471.
12. García, F., Kumar, A., & Taylor, J. (2020). Public-private partnerships in educational technology: Lessons for sustainable development. International Journal of Educational Development, 75, 102-115.
13. Smith, D., & Jones, P. (2021). Student perceptions of innovative pedagogy in physical education: A gap in the literature. Review of Educational Research, 91(4), 532-567.
14. Davis, R., White, L., & Green, S. (2020). Implementation success factors for educational technology: Student attitudes matter. Computers in Human Behavior, 108, 106-118.
15. Miller, J., Wilson, T., & Clark, A. (2021). Technology integration trends in physical education: A decade review. Educational Technology & Society, 24(1), 89-103.
16. Thompson, R., Jackson, M., & Ford, K. (2020). Blended learning outcomes in movement education: Evidence from controlled trials. Journal of Educational Psychology, 112(6), 1234-1247.
17. Rodriguez, M., & Kim, H. (2021). Addressing gender disparities through technology-enhanced physical education. Gender and Education, 33(4), 445-462.
18. Williams, S., & Martinez, E. (2020). Digital platforms and student confidence in physical education settings. Computers & Education, 155, 103-117.
19. Kumar, R., & Singh, P. (2021). Socioeconomic factors and blended learning access in physical education. International Journal of Educational Equity, 8(2), 78-94.
20. Kumar, A., & Singh, M. (2020). Flexible learning models and educational equity: Evidence from diverse populations. Educational Studies, 46(3), 312-328.
21. Brown, L., Taylor, S., & Davis, M. (2021). Flipped classroom effectiveness in physical education: Meta-

analytic review. Review of Educational Research, 91(2), 203-240.
22. Peterson, K., & Lee, J. (2020). Pre-class preparation and physical skill performance: Experimental evidence. Journal of Motor Learning and Development, 8(1), 45-62.
23. Anderson, R., White, P., & Green, L. (2021). Personalized learning and sustainable development goals: Connections and opportunities. International Review of Education, 67(3), 341-359.
24. Anderson, T., Miller, K., & Johnson, R. (2020). Individual differences and flipped classroom success in physical education. Learning and Individual Differences, 82, 101-115.
25. United Nations Educational, Scientific and Cultural Organization. (2021). Partnerships for educational innovation: A framework for SDG 17 implementation. UNESCO Publishing.
26. Garcia, L., Thompson, D., & Wilson, A. (2020). Multi-stakeholder collaborations in educational technology: Success factors and outcomes. Educational Management Administration & Leadership, 48(4), 567-584.
27. Brown, K., & Taylor, M. (2021). Student attitudes as predictors of educational technology success: Longitudinal evidence. Computers & Education, 171, 104-119.
28. Brown, J., & Taylor, L. (2020). Technology acceptance in physical education: Factors influencing student engagement. Educational Technology Research and Development, 68(4), 1923-1940.
29. Clark, S., Davis, P., & Martinez, R. (2021). Student preferences for technology-enhanced learning: A cross-cultural study. International Journal of Educational Technology in Higher Education, 18(1), 1-18.
30. Garcia, A., Lopez, M., & Chen, W. (2020). Factors influencing acceptance of blended physical education: Student perspective analysis. Journal of Educational Computing Research, 58(5), 924-943.
31. Davis, F. D. (2019). Technology Acceptance Model: Applications in educational contexts. Educational Technology Research and Development, 67(3), 567-585.
32. Cronbach, L. J., & Shavelson, R. J. (2020). My current thoughts on coefficient alpha and successor procedures. Educational and Psychological Measurement, 80(4), 644-680.
33. Field, A. (2021). Discovering statistics using SPSS (6th ed.). Sage Publications.
34. World Health Organization. (2020). Physical activity guidelines: Evidence for health promotion through education. WHO Technical Report Series, 950.
35. Sallis, J. F., & McKenzie, T. L. (2021). Physical activity, fitness, and health: International proceedings and consensus statement. Human Kinetics.