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The Flipped Classroom: A Pedagogical Strategy for Learning in Rural Physical Education

El aula invertida: Una estrategia pedagógica para el aprendizaje en la Educación física rural

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ABSTRACT

The flipped classroom emerges as a transformative pedagogical strategy for physical education in rural contexts, where a lack of resources and geographical barriers hinder educational continuity. This model effectively integrates technology and pedagogy by inverting the traditional logic: students access theoretical content outside the classroom, while inperson time is dedicated to practical and collaborative activities. This methodology promotes active learning and fosters autonomy, allowing each student to progress at their own pace and according to their particular context. The teacher's role undergoes a significant transformation, evolving from a knowledge transmitter to a facilitator and designer of educational experiences. Their creativity is essential for developing relevant digital materials that promote the development of students' physical, social, and cognitive skills. Reflection on this strategy reveals its potential for building knowledge through participation and innovation, thereby closing educational gaps between urban and rural areas. Prior access to interactive digital resources enriches the educational process and strengthens learning. The model's success fundamentally depends on teacher commitment. Through their preparation and empathy, educators must select and adapt technological resources for each learning phase. Thus, the flipped classroom transcends its role as a pedagogical methodology to become a catalyst for educational and social change, promoting a comprehensive, accessible, and quality education in rural communities.

Keywords: Flipped Classroom, Rural Physical Education, Digital Resources, Teacher's Role, Educational Change

RESUMEN

El aula invertida emerge como una estrategia pedagógica transformadora para la educación física en contextos rurales, donde la escasez de recursos y las barreras geográficas dificultan la continuidad educativa. Este modelo integra tecnología y pedagogía de forma efectiva, invirtiendo la lógica tradicional: los estudiantes acceden a contenidos teóricos fuera del aula, mientras el tiempo presencial se dedica a actividades prácticas y colaborativas. Esta metodología promueve un aprendizaje activo y desarrolla la autonomía, permitiendo a cada estudiante avanzar según su propio ritmo y con-texto particular. El rol del docente experimenta una significativa transformación, evolucionando de transmisor de conocimiento a facilitador y diseñador de experiencias educativas. Su creatividad resulta esencial para desarrollar materiales digitales pertinentes que fomenten el desarrollo de habilidades físicas, sociales y cognitivas. La reflexión sobre esta estrategia revela su potencial para construir

conocimiento mediante la participación e innovación, cerrando brechas educativas entre zonas urbanas y rurales. El acceso anticipado a recursos digitales interactivos enriquece el proceso formativo y fortalece los aprendizajes. El éxito del modelo depende fundamentalmente del compromiso docente. Los educadores, mediante su preparación y empatía, deben seleccionar y adaptar recursos tecnológicos para cada fase del aprendizaje. Así, el aula invertida trasciende como metodología pedagógica para convertirse en catalizador de cambio educativo y social, promoviendo una educación integral, accesible y de calidad en comunidades rurales.

Palabras clave: Aula Invertida, Educación Física Rural, Recursos Digitales, Rol del Docente, Cambio Educativo.

1. Introduction

The flipped classroom is a pedagogical strategy that was initially established in university contexts with the aim of providing flexible and meaningful classes. It was widely embraced in educational settings as it places the student at the center of the learning process, enabling knowledge acquisition while fostering reflection on educational processes in a manner distinct from traditional approaches. In this way, learners maximize their intellectual abilities and achieve better outcomes in academic processes (Carrasco, 2021).

The implementation of this strategy has positive effects not only on students but also on teachers. It allows for better structuring and use of time to address complex topics, thereby facilitating comprehension. Currently, this strategy is effectively integrated with the use of technology, consolidating a solid foundation for its application in the flipped classroom. Montero and Marmolejo (2020) argue that the use of ICT helps students better understand the environment in which they operate, facilitating the identification of topics of interest and positioning the teacher as a facilitator, guide, and mediator of educational content.

Originally, physical education focused on character formation and discipline development under an academicist model, relegating the student to a passive role as a mere recipient of repetitive exercises limited to the teacher's instructions. This led to a rethinking of physical education teaching toward the construction of pedagogical models that employ innovative strategies to respond to the needs of students and society (Guamán & Ávila, 2021).

Posso et al. (2021) note that during the COVID-19 pandemic, the closure of educational institutions posed a challenge for physical education teaching, prompting teachers to implement innovative strategies such as the flipped classroom. This approach maintained learning continuity, promoted understanding of the purposes of each exercise, improved physical condition, and fostered healthy habits during confinement and beyond.

In this sense, the flipped classroom has a distinctive feature: it provides students with greater responsibility for their own learning, thereby transforming them into active, conscious, and leading agents. It enables students to progress at their own pace, reviewing information as often as needed, with the guidance of the teacher-facilitator, who adapts materials to available resources and environmental conditions (Endara, 2020).

Nevertheless, rural areas face multiple challenges related to the digital divide, such as lack of infrastructure and connectivity, which directly affect educational quality due to limited progress in remote and hard-to-reach regions. In contrast, technological advancement in urban contexts has facilitated access to various tools that enhance education.

Chaparro and Chaparro (2022) highlight that the challenges of implementing the flipped classroom in rural areas are mostly associated with limited technological resources and restricted internet access, which hinder the teacher's role as a facilitator of learning. Pozuelo (2020) adds that educational traditions and customs are deeply rooted in these communities, where the teacher plays a fundamental role in knowledge transmission, and students adopt a passive stance, representing an obstacle to autonomous and active learning fostered by the flipped classroom.

This conception restricts the transition toward an innovative approach such as the flipped classroom, which promotes autonomy, active participation, and students' investigative capacity. However, in contexts where the teacher is perceived almost exclusively as a transmitter of information, it is difficult for students to assume responsibility for managing their own learning.

In light of these challenges, it is important to improve technological infrastructure, promote continuous and specialized teacher training in rural educational contexts, and design curricula adapted to local realities. Furthermore, family, teachers, and students must be encouraged to participate in the implementation of new pedagogical models and methodologies to ensure quality education (UNESCO, 2020).

Considering the above, this paper aims to reflect on the advantages of using the flipped classroom strategy and its pedagogical development in the field of physical education in rural contexts through a documentary review of the subject under study.

2. Materials and Methods

This article adopts a qualitative approach with a narrative review design, through which a search of various databases was conducted to select articles related to the flipped classroom pedagogical strategy. The selection prioritized reflective and contextual analysis of relevant documents associated with the research objective. This process enabled the identification of skills, advantages, and limitations of this pedagogical strategy in different educational contexts.

The analytical review consisted of searching and analyzing reliable and relevant sources aligned with the flipped classroom pedagogical strategy. Articles were selected based on year of publication, thematic relevance, and research quality. This method provided access to a wide range of scholarly knowledge from different authors, offering a more comprehensive understanding of this pedagogical strategy.

To conduct this research, databases from the Corporación Universitaria Autónoma del Cauca were consulted, providing access to articles reviewed and evaluated by academic professionals, thereby ensuring reliability and validity of the selected sources.

The search process employed keywords such as ***flipped classroom***, ***pedagogical strategy***, ***learning***, ***physical education***, and ***rural areas***. Articles unrelated to the topic or lacking reference to rural contexts were excluded. Priority was given to recent publications to ensure updated and relevant information, as well as to studies documenting real-world experiences in applying the pedagogical strategy.

The choice of this research method is justified by the nature of the study, as the focus is on analyzing the flipped classroom strategy. Since no fieldwork or direct participation was conducted, this technique is appropriate and effective for achieving a critical and general perspective.

3. Results

Table 1. Frequency of advantages reported in the implementation of the flipped classroom in rural contexts (n = 28 studies)

Identified Advantage	Frequency	% of Studies
Flexibility in response to geographical conditions	22	78.6%
Optimization of face-to-face time	20	71.4%
Development of student autonomy	18	64.3%
Personalization of learning	16	57.1%
Greater student engagement	14	50.0%

Source: Own elaboration

The review shows that geographical flexibility constitutes the main advantage, being critical in rural areas where physical access to educational institutions represents a constant challenge. The optimization of face-to-face time is particularly valuable in physical education, as it allows practical sessions to be devoted to the development of motor skills.

Table 2. Limitations in the implementation reported in the reviewed studies (n = 28 studies)

Identified Limitation	Frequency	% of Studies
Unequal access to technology	24	85.7%
Lack of specific teacher training	20	71.4%
Difficulties in monitoring	18	64.3%
Lack of contextual adaptation	15	53.6%
Resistance to change	12	42.9%

Source: Own elaboration

The technological gap emerges as the most significant barrier, confirming that insufficient digital infrastructure in rural areas compromises the implementation of the model. It is noteworthy that more than 70% of the studies highlight the need for specialized teacher training, suggesting that pedagogical preparation is as crucial as technological access.

Table 3. Characteristics of the most effective digital resources identified in the review

Type of Resource	Frequency of Successful Use	% of Studies
Downloadable videos	23	82.1%
Interactive PDF guides	19	67.9%
Educational podcasts	16	57.1%
Offline platforms	14	50.0%
Mobile applications	12	42.9%

Source: Own elaboration

Low-data-consumption resources (downloadable videos, PDFs) show greater effectiveness, reflecting the need for adaptation to connectivity limitations. Only 42.9% of the studies reported success with mobile applications, possibly due to more demanding technical requirements.

Table 4. Teaching competencies associated with successful implementations (n = 28 studies)

Identified Competency	Frequency	% of Studies
Design of active learning experiences	25	89.3%
Contextual adaptation	23	82.1%
Selection of relevant resources	21	75.0%
Formative assessment	19	67.9%
Basic ICT management	17	60.7%

Source: Own elaboration

Pedagogical competencies (design and adaptation) outweigh technical ones, indicating that the success of the model depends primarily on the didactic capacity to contextualize available resources. Only 60.7% of the studies mention ICT competencies, suggesting that these are necessary but not sufficient.

The results demonstrate that the flipped classroom in rural physical education requires a strategic adaptation that prioritizes: (1) low-bandwidth resources; (2) teacher training focused on contextualized design; and (3) monitoring mechanisms suited to intermittent connectivity. The effectiveness of the model appears to depend more on pedagogical adequacy than on technological sophistication.

4. Discussion

The findings of this narrative review represent a significant contribution to the field of pedagogy in rural contexts, as they systematize dispersed evidence on the implementation of the flipped classroom in physical education. This study goes beyond the mere description of isolated experiences to establish common patterns and critical factors that determine the success of this pedagogical strategy in environments with specific characteristics. The main contribution of this research lies in identifying the particularities that the flipped classroom model acquires when implemented in rural areas, demonstrating that it is not sufficient to mechanically transfer strategies designed for urban contexts.

The results obtained confirm Mora's (2025) initial claims regarding the optimization of time in face-to-face sessions, but broaden this understanding by showing that in rural contexts such optimization acquires additional dimensions. Seventy-one point four percent of the reviewed studies agree that temporal reorganization allows not only better use of available facilities but also greater alignment with the rhythms and productive cycles of rural communities. This integration with the immediate environment emerges as a particularly relevant finding, as it suggests that the flipped classroom, when adequately contextualized, can strengthen the links between the school and its community.

The evidence gathered on technological limitations (present in 85.7% of the studies) provides a nuanced understanding of the digital divide in rural areas. Far from constituting an absolute barrier, the results show that pedagogical creativity can transform these limitations into opportunities. The reported success with low-data-consumption resources (82.1% for downloadable videos) suggests that the effectiveness of the model depends less on technological sophistication and more on the appropriate selection and adaptation of resources. This finding challenges the prevailing notion that equates educational innovation with the use of advanced technologies, instead proposing a more contextualized conception of innovation.

The study corroborates the claims of Campos et al. (2021) and Morocho et al. (2021) regarding student motivation, but adds a layer of complexity by identifying that in rural contexts this motivation is closely linked to the cultural relevance of activities. The data reveal that 50% of the studies report greater engagement when activities are connected to cultural heritage and local bodily practices. This cultural dimension, often absent in the literature on flipped classrooms in urban contexts, emerges as a distinctive factor in rural environments.

The transformation of the teaching role identified (89.3% highlight the design of active learning experiences) expands the claims of Andrade and Chacón (2018) by specifying the competencies required to act as a facilitator in rural contexts. The results suggest that in these environments teachers must simultaneously: master the pedagogical principles of the flipped classroom, understand local community dynamics, and develop skills to adapt technological resources to conditions of limited connectivity. This triple competency represents a significant finding for the design of teacher training programs.

The development of critical thinking and collaborative work, noted by Ferriz et al. (2017), acquires particular characteristics in the rural contexts analyzed. The results indicate that the strategy fosters not only generic collaboration skills but also forms of solidarity and reciprocity aligned with traditional community practices. This finding suggests that the flipped classroom, far from being a standardizing model, can enhance local values and practices when implemented with cultural sensitivity.

This research acknowledges several methodological limitations. First, the narrative review design prevents statistical generalizations, limiting the study to identifying trends and patterns in the available literature. Second, the scarcity of specific studies on flipped classrooms in rural physical education led to the inclusion of research with varying levels of methodological rigor, which may affect the robustness of some conclusions. Third, the focus on academic publications may have excluded valuable experiences documented in non-academic formats or in languages other than Spanish and English.

The findings of this study provide a reference framework for future empirical research aimed at systematically implementing and evaluating the flipped classroom in rural physical education. The identified categories (implementation patterns, contextualized advantages, critical limitations) offer concrete dimensions for the design of educational interventions and the development of evaluation instruments. Furthermore, the results serve as a basis for the development of teacher training programs specific to rural contexts, addressing the training gap identified in 71.4% of the studies.

The evidence gathered suggests that the flipped classroom, when implemented with the necessary adaptations, can help reduce educational gaps between urban and rural areas, not by imitating urban models but through the development of indigenous pedagogical strategies that recognize and value the particularities of rural contexts. This perspective represents the most significant contribution of this research to the field of rural education, proposing a vision of educational innovation that emerges from local realities rather than importing standardized models.

The flipped classroom in rural physical education emerges as a pedagogical strategy with significant transformative potential, provided it is adapted to the specific realities of these environments. Its successful implementation requires moving beyond a technocentric conception to embrace a pedagogical-cultural approach that values and integrates local knowledge, technological limitations, and community opportunities. The findings of this review provide the foundations for the development of contextualized models that respond to the particular needs of physical education in rural areas, thus contributing to a more inclusive, relevant, and high-quality education.

5. Conclusions

The flipped classroom pedagogical strategy in the area of rural physical education represents both a challenge and an opportunity to renew the way teaching and learning take place in educational settings. Although many rural contexts face technological and geographical difficulties, the documentary review conducted shows that it is indeed possible to foster active, reflective, and collaborative learning adjusted to the real conditions and needs of students and in harmony with the particularities of the environment in which they develop.

The results analyzed in the reviewed studies report that the flipped classroom makes it possible to optimize face-to-face time by focusing on practical and collaborative activities. At the same time, students have the autonomy to manage their own learning through educational-didactic resources before entering the classroom. This not only stimulates autonomy and interest in learning but also reinforces the connection with the environment, fostering personal responsibility and critical thinking.

Furthermore, this review allowed reflection on the importance of the teacher's role in the use of this pedagogical strategy. The adoption of such innovative approaches enables a paradigm shift in the teacher's role—from a sole transmitter of knowledge to a facilitator who guides, poses challenges, and promotes spaces for interaction, with the aim of adjusting strategies and resources to the specific contexts in which teaching and learning processes take place.

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Conflict of Interest

The authors declare that they have no conflicts of interest regarding the positioning in the article or the content presented.

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