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Original article

Curricular adaptations for the inclusion of students with physical disabilities in the Physical Education lesson

Adaptaciones curriculares para la inclusión de estudiantes con discapacidad física, en la clase de Educación Física

Adaptações curriculares para inclusão de alunos com deficiência física nas aulas de educação física.



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ABSTRACT







The inclusion of students with physical disabilities in Physical Education classes requires curricular adaptations that allow their active and significant participation in the planned activities; therefore, it was necessary to evaluate the specific skills and needs of each student with disabilities, in order to adapt this curriculum; however, despite inclusion being a global demand and a need for education in Ecuador, there are still no new and effective methods to put them into practice, which is why the objective of the research was to propose a guide for working with curricular adaptations in Physical Education, based on the inclusion of students with physical disabilities. The guide was conceived in multimedia format, taking advantage of the potential of information technologies to motivate, visualize and extend educational practices to the home and the community. To confirm the deficiencies in knowledge and practice of curricular adaptations, various empirical methods were used such as interviews, surveys, scientific observation and content analysis that allowed a detailed and rich understanding of individual experiences and perceptions, as well as the impact of multimedia as a resource to make curricular adaptations viable in Physical Education classes. The initiative had a favorable opinion among students, teachers and family members.

Keywords: Curricular adaptations, physical disability, inclusion, multimedia tutorial

RESUMEN

La inclusión de estudiantes con discapacidad física en la clase de Educación Física requiere adaptaciones curriculares que permitan su participación activa y significativa, en las actividades planificadas; por consiguiente, se hizo necesario evaluar las habilidades y necesidades específicas de cada estudiante con discapacidad, para adaptar este currículo; sin embargo, a pesar de ser la inclusión una demanda global y una necesidad de la educación en Ecuador, todavía no se cuenta con los métodos más novedosos y efectivos para ponerlos en práctica, es por ello que el objetivo de la investigación fue proponer una guía para el trabajo con las adaptaciones curriculares en Educación Física, en función de la inclusión de estudiantes con discapacidades físicas. La guía fue concebida en formato multimedia, se aprovecharon las potencialidades de las tecnologías de la información para







motivar, visualizar y extender las prácticas educativas hacia el hogar y la comunidad. Para confirmar las deficiencias en el conocimiento y la práctica de las adaptaciones curriculares, se utilizaron diversos métodos empíricos como entrevistas, encuestas, observación científica y análisis de contenido que permitieron una comprensión detallada y rica de las experiencias y percepciones individuales, así como el impacto de la multimedia como recurso para viabilizar las adaptaciones curriculares en la clase de Educación Física. La iniciativa contó con un favorable estado de opinión de estudiantes, profesores y familiares.

Palabras clave: adaptaciones curriculares, discapacidad física, inclusión, multimedia tutorial

RESUMO

A inclusão de alunos com deficiência física nas aulas de Educação Física requer adaptações curriculares que permitam sua participação ativa e significativa em atividades físicas; portanto, é necessário avaliar as habilidades e necessidades específicas de cada aluno com deficiência para adaptar o currículo das aulas de Educação Física. Entretanto, apesar da inclusão ser uma demanda global e uma necessidade da educação no Equador, ainda não existem métodos novos e eficazes para implementar essas adaptações curriculares, razão pela qual o objetivo da pesquisa é: propor um guia para trabalhar com adaptações curriculares em Educação Física baseada na inclusão de alunos com deficiência física. Este guia foi concebido em formato multimídia, aproveitando o potencial das tecnologias da informação para motivar, visualizar e estender práticas educacionais ao lar e à comunidade. Para confirmar deficiências no conhecimento e na prática das adaptações curriculares, são utilizados diversos métodos empíricos, como entrevistas, pesquisas, observação científica, grupos focais e análise de conteúdo. Esses métodos permitem uma compreensão detalhada e rica das experiências e percepções individuais, bem como do impacto da multimídia como recurso para possibilitar adaptações curriculares na aula de Educação Física. A iniciativa recebeu uma resposta favorável de professores, alunos e famílias de crianças com deficiência física.







Palavras-chave: Adaptações Curriculares; Inclusão; Deficiência física; Educação física; Tutorial multimídia.

INTRODUCTION

When addressing educational inclusion, it is important to remember that the main objective of the Salamanca Declaration was aimed at advocating for inclusive education, and attention to diversity in the educational context, thereby recognizing the importance of ensuring that all students, including those with disabilities, have access to quality education; in this way it is made possible for people with special educational needs (SEN) to have access to ordinary school, with a student-centred pedagogy, capable of meeting their needs. needs (lodi, 1994).

In addition to specific curricular adaptations, it is essential to consider a holistic approach that includes ongoing teacher training and awareness-raising throughout the educational community. Effective inclusion is not only based on structural changes in the curriculum, but also on promoting a school culture that values and respects diversity. Arias' research (2022) highlights that training in inclusive education should be a priority in professional development programs for teachers, which coincides with the needs identified in the research carried out.

Curricular adaptations play a crucial role in promoting the inclusion of students with physical disabilities in Physical Education (PE) classes. These adaptations can take various forms, from the modification of activities and teaching materials to training and specialized support for teachers with the purpose of eliminating the barriers that prevent the participation of students with physical disabilities, and facilitating their access to learning opportunities and comprehensive development in this subject (Cevallos, 2020).

Diversity in the classroom is an omnipresent reality in most educational settings, and it is essential to recognize and value it as an enriching asset. By doing so, an enabling environment is fostered that promotes respect, understanding, and reciprocal learning







among students; it also offers teachers a valuable opportunity to adapt teaching methods, which respond to individual needs, learning rhythms, and diverse styles. Effective management of diversity in the classroom is not only essential to foster inclusion, but also contributes to the educational success of all students (Zarzosa, 2021).

Regarding curricular adaptations, it is proposed that these are modifications or adjustments that are made to the educational curriculum to respond to the specific needs of students. These adaptations can cover different aspects of the curriculum, such as learning objectives, content, method, evaluation activities and educational resources; seen in this way, the access, participation and effective learning of students is guaranteed (Fernández, 2021).

Assessing the specific skills and needs of each student with a physical disability is a fundamental step to ensure effective curricular adaptation in the context of PE. This process involves a detailed analysis of the physical, emotional and cognitive abilities of each student, as well as their interests and preferences, in relation to physical and sports activities (Cepeda, 2022).

By deeply understanding each student's strengths and limitations, teachers can individually design and adjust the PE curriculum, ensuring that activities are meaningful, relevant, and accessible to all, regardless of their differences. This individualized approach not only promotes the active participation of students with physical disabilities, but also fosters their sense of autonomy and empowerment by recognizing and valuing their unique abilities (Cárdenas, 2022).

In this sense, inclusive education has an educational approach that seeks to guarantee the access, participation and success of all students, regardless of their individual characteristics or conditions, in regular and common educational environments; it means that it seeks to provide learning opportunities to all students and includes those with learning difficulties, exceptional talents or any other difference that may influence their learning process within a classroom (Márquez, 2022).







Therefore, it can be argued that inclusive education seeks to reduce barriers, promote equal opportunities for all students within the classroom, benefit students with specific needs, and enrich the educational experience of the entire school community, from an environment of respect, understanding and collaboration (Arias, 2022).

Adapting physical activities to ensure accessibility and safety for students with physical disabilities is essential for their full participation in the PE class. This modification process may involve a variety of adjustments aimed at meeting the SEN of each student, while promoting their active inclusion in physical and sporting activities (Cepeda, 2022).

One of the key strategies for this is the adaptation of the intensity of the activities, which involves adjusting the level of difficulty, reducing the pace, the duration of the activities, as well as the introduction of variations that allow safe, comfortable, appropriate and achievable participation for students with physical disabilities (Contreras, 2022).

Adapting the physical environment includes the design of the space and accessibility of sports facilities, as an essential measure to ensure that all students, including those with physical disabilities, can participate safely and effectively in the PE class; this not only guarantees accessibility, but promotes an inclusive environment that respects and values the diversity of individual abilities and needs (García, 2022).

Educational inclusion has become a fundamental principle in the promotion of equity and equal opportunities in the school environment. In this context, attention to diversity and particularly the inclusion of students with physical disabilities has been the subject of increasing attention in the educational community. The implementation of curricular adaptations is presented as a key strategy to guarantee the full and effective participation of these students in the PE class and thus ensures their right to an inclusive and quality education (Castro, 2023).

The inclusion of students with physical disabilities in PE classes poses significant challenges, both pedagogical and practical. These students may face physical, social and emotional barriers that hinder full and meaningful participation in physical and sporting activities.







However, it is essential to recognize that disability should not be seen as an insurmountable limitation, but rather as a difference that requires adjustments and adaptations, in order to guarantee equal opportunities and the full exercise of educational rights (MINEDUC, 2023).

In this sense, several intelligences are identified, including linguistic, logical-mathematical, spatial, musical, bodily- kinesthetic, intra- and interpersonal intelligence, among others. In the context of the inclusion of students with physical difficulties in the PE class, it can be considered how the different intelligences come to be used and developed in an integral way in the class (Castro, 2023).

However, despite inclusion being a global demand and a necessity for education in Ecuador, there are still no innovative and effective methods to implement these curricular adaptations. That is why the objective of the research was to propose a guide for working with curricular adaptations in PE, based on the inclusion of students with physical disabilities.

To this end, a comprehensive review of the scientific and pedagogical literature related to this topic was carried out, with the aim of identifying the most relevant and effective practices and strategies in this area. Through this analysis, the aim was to offer practical recommendations for teachers, education professionals and other actors involved in promoting the educational inclusion of students with physical disabilities (Cervantes, 2023).

MATERIALS AND METHODS

The research was based on exploratory-descriptive approaches, qualitative and quantitative in nature with a comprehensive approach. Documentary analysis, an interview with an expert academic peer, and an assessment of the observation record of students who presented the learning difficulty were used. Data analysis was performed with the SPSS data processing program.

The unit of analysis corresponded to third-year students of Unified General Baccalaureate, population: 40, and a sample of one student with a physical disability percentage of 50%, with an adaptation degree of two.





The study was based on the theoretical method for the analysis and interpretation of theories, concepts and conceptual frameworks relevant to the topic, which involved examining the validity, applicability and limitations of the theories for the specific research. In this case, the theoretical bases of the relationship between curricular adaptation and the inclusion of students with physical disabilities in an Educational Unit in Babahoyo were examined.

The research used various empirical methods such as interviews, surveys, scientific observation and content analysis that revealed knowledge about the identification and analysis of theories and models related to curricular adaptations, diversity in the classroom, inclusive education and physical disability. The operationalized dimensions and indicators to be taken into account in the application of empirical methods were:

Table 1. Indicators of the variable under study: Curricular Adaptations

Dimension: Design of Curricular Adaptations	
Indicators	
1.	Curriculum Flexibility
2.	Variety of Activities
3.	Accessibility of Materials and Equipment

The study had three fundamental stages: the application of the initial diagnosis to determine the deficiencies related to the object of study, as well as the potential available to resolve this problem; the elaboration and application of a proposal aimed at solving, from a theoretical and practical point of view, this weakness of science in the educational context; and the empirical assessment of the impact of the proposed solution. It is in this section that the reflections and criteria for its generalization and perfection were collected.

RESULTS AND DISCUSSION

To assess the impact of curricular adaptations on the inclusion of students with physical disabilities in PE classes, data were collected through various methods and instruments. In the initial diagnosis, it was confirmed that there were deficiencies in:





- Knowledge about curriculum flexibility: 10% of students had mastery over this aspect.
- variety of activities: 20% were able to mention some activities on curricular adaptations in PE.
- Accessibility of materials and equipment: 5% of students had access to materials, especially audiovisual, on the topic of inclusion in PE.

Given the lack of materials and methodologies, a multimedia tutorial was developed to promote and strengthen the knowledge and practice of curricular adaptations.

Curricular adaptations for the inclusion of students with physical disabilities in Physical Education classes, through the use of a multimedia tutorial

Normally, PE classes were designed to develop students' physical abilities (speed, flexibility, endurance, strength), to help them face life situations in better physical condition, and to bring them closer to the sports field. However, with the urgent need to incorporate activities for students with specific special educational needs into the work plans, it became necessary to make adaptations in this regard.

The criteria of Beltrán et al. (2022) were used as a starting point: "(...) the Curricular Adaptations have the purpose of adjusting objectives and contents proposed to those students who have difficulty in achieving those initially proposed" (p.110). Their approaches to the objectives were assumed:

Different specific objectives related to the theme of the Teaching Unit (UD in Spanish) must be worked on. These teaching objectives must be related to cooperative work, presenting an evolution over time and must be contextualized with the theme. In this UD, some of the teaching objectives that can be developed are:

- promote inclusive physical activity in educational centres.
- to publicize the educational offer in relation to curricular activities.
- promote teamwork and collaboration among colleagues.
- to make students aware of the importance of inclusion.
- promote attitudes of respect and empathy.







- develop teamwork and collaboration.
- develop healthy lifestyle habits. (Beltrán et al., 2020, p. 102)

In addition to these stated objectives, the following were added:

- make rational use of information technologies to prepare teachers and create and/or provide technological means for the learning of these students.
- take advantage of the potential of interdisciplinarity linked to PE, to influence the comprehensive training of students.
- transmit pedagogical experiences to the family, to achieve inclusive education based on the home-school connection.

In relation to the contents, it was assumed that "The contents are understood as the set of tools related to the skills, abilities and knowledge that help students achieve the objectives proposed by the teacher" (Beltrán et al., 2020, p. 103).

Thus, in order to address the objectives and content specifically, the use of technologies, interdisciplinarity and home-school linkage was proposed, through the multimedia resource "De tu mano", a material developed to support the PE teacher, from instruction, self-preparation, independent work and collaboration with parents. (See figure 1)



Figure 1. "De tu mano". Multimedia to support the work of PE teachers with students with physical disabilities and other SEN. (This resource offers essential content for inclusive work in PE)







On the other hand, the didactic strategy in PE for inclusion (Ibarra, et al., 2020) and its organization in phases were taken into consideration to put into practice these contextualized curricular adaptations, according to the intervention proposal. (Working with multimedia)

1) Pre-active phase: decisions prior to class time. (Determining achievement expectations, activities, teaching styles, organizational strategies, selecting tasks, and others)

Contextualization: inclusive elements were addressed both for students with physical disabilities and for their classmates, the teacher was able to use a laptop or convert parts of the resource into photos and show the parts of the multimedia on a television, with an internal decoder box (jpeg format).

The multimedia offered certain tasks to be carried out inside and outside of class to facilitate inclusion, such as tutorial videos from specialists who developed PE with students with certain physical disabilities; exercises were carried out that developed physical and mental abilities; cooperative work styles were applied; materials were shown to motivate the class; students' expectations were explored; and independent work was guided.

2) Interactive phase: interventions during the action. (Presentation of the task, feedback or informative evaluation, monitoring, etc.)

Contextualization: Once the multimedia was presented, it was guaranteed that each student had access to it, in the school's computer labs or at home. In each section of the resource there was a tutorial to observe the orientation of the exercise to be performed and develop a certain physical capacity according to the different motor disorders or deficiencies diagnosed. The teacher monitored the assimilation of the content with comprehension questions and gradually evaluated the progress of the tasks. One of the potentialities of its application was that the student always had a guide, from the use of technology and appropriate training.

3) Post-active phase: reflection, rethinking and evaluation (how the learning turned out).







Contextualization: at the end of the class, the PE teacher asked the students evaluation questions about the completion of the activities, encouraged co- and self-evaluation, and reflected on cognitive aspects and future work projections.

The potential of this material allowed to not only assess the students' performance in class, but also the collaboration of their classmates and also their parents and family members when guiding a task as independent work.

Assessment of the results of curricular adaptations in the Physical Education class, through work with multimedia

Regarding the results of the questionnaire for students on the use of multimedia, a significant improvement was shown in their participation and satisfaction in the PE class, greater confidence in their skills was provided, as well as a greater sense of belonging and acceptance by their peers. In Figure 2, the difference in results between the initial diagnosis and the assessment of the impact of Multimedia can be observed.

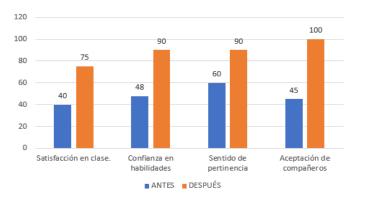


Figure 2 Questionnaire results (Diagnosis vs. implementation of multimedia)

Note: Students with physical disabilities show a significant improvement in participation and satisfaction in the PE class, after the implementation of curricular adaptations.

In interviews with PE teachers, the importance of curricular adaptations in creating an inclusive environment and in improving the engagement and participation of all students







in classes was highlighted; the need to make curriculum design more flexible to accommodate the individual needs of students with physical disabilities was emphasized.

Classroom observations confirmed the effectiveness of curricular adaptations in promoting active participation of students with physical disabilities in the proposed activities, with higher levels of motivation, greater social interaction, collaboration and self-confidence among them, from an inclusive and supportive learning environment.

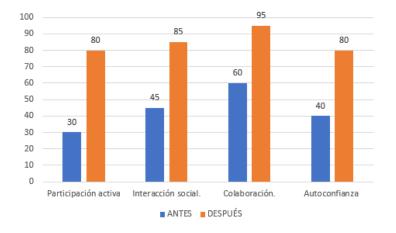


Figure 3. Scientific observation applied to the educational teaching process

Note: A significant and robust improvement in social interaction, collaboration and selfconfidence was observed among students during PE classes, indicating that the curricular adaptations had a positive impact.

The use of multimedia included the implementation of various adapted activities within the PE curriculum, including mobility and muscle strengthening exercises, cooperative games, and modified sports such as wheelchair basketball and boccia, all guided by experts with excellent communication skills; stretching and balance activities were also incorporated, as well as adapted motor skills circuits. Each activity was designed to be inclusive, ensuring active participation of students and the benefit of physical exercise in a safe and effective manner.

The results obtained supported the importance of curricular adaptations as a fundamental strategy to promote the inclusion of students with physical disabilities in the PE class; the







implementation of a multimedia with adaptations focused on individual needs proved to be effective in eliminating the physical and social barriers that limited their participation and development in this area.

The improvement in student perceptions and positive feedback from teachers reflected the positive impact of curricular adaptations on the educational experience of all students in the classroom. The inclusion of students with physical disabilities not only benefited the students themselves, but also enriched the educational environment and promoted values of diversity, respect, and collaboration among all members of the school community.

Research on curricular adaptations for the inclusion of students with physical disabilities in the PE classroom was aligned with numerous previous studies that highlighted the importance of these strategies to foster an inclusive and equitable educational environment.

The results of the use of multimedia, reflected in the questionnaire, revealed a significant improvement in the perception of students with physical disabilities about their participation and satisfaction in the PE class, after the implementation of the curricular adaptations; this finding was consistent with the research of Bermúdez (2019) who found that the curricular adaptations increased the active participation and enjoyment in PE classes of students with SEN.

Similarly, students reported increased confidence in their skills, as well as a greater sense of belonging and acceptance by their peers; these results were in line with findings by Gomez (2020) who highlighted that an inclusive PE environment was able to increase self-confidence and a sense of social inclusion among students with SEN. Furthermore, research by Tripp (2017) highlighted that personalized curricular adjustments can reduce social barriers and foster a sense of community and support.

Classroom observations, while the multimedia was projected and the exercises were carried out, confirmed the effectiveness of the curricular adaptations in promoting the active participation of students with physical disabilities in physical and sports activities. Higher levels of social interaction, collaboration and self-confidence were observed among







students, suggesting an inclusive and supportive learning environment; results comparable to those of Campos (2019) who found that the inclusion of adapted physical activities not only benefited students with disabilities, but promoted greater empathy and cooperation among them.

The implementation of various adapted activities in PE such as mobility and muscle strengthening exercises, cooperative games and modified sports guided by the use of multimedia proved to be effective in eliminating physical and social barriers to the participation of students with physical disabilities; in this regard, Saldivia `s study (2019) demonstrated that adapted sports activities and cooperative games were effective strategies to promote the inclusion and comprehensive development of students with disabilities.

CONCLUSIONS

Curricular adaptations in PE played a crucial role in promoting the inclusion of students with physical disabilities; it was considered essential that teachers receive adequate training in the design and implementation of these adaptations, to ensure an inclusive learning environment; and the use of multimedia guides, to facilitate collaboration between teachers, students and families.

The multimedia De tu Mano, designed to promote collaboration and teamwork between teachers, students and legal representatives, was an effective tool to implement curricular adaptations, to effectively address the specific needs of each student with a physical disability and ensure their full participation and development during the PE class.

Recognizing diversity in the classroom as an enriching asset was essential to promoting an inclusive environment that fostered respect, understanding, and reciprocal learning among all students, regardless of their physical skills; to this end, the professional development of teachers in the design and implementation of curricular adaptations guaranteed the effectiveness of the application of multimedia.

The lack of diversity in the sample affected the generalizability of the results to other populations of students with physical disabilities. In addition, the lack of long-term follow-



up after the implementation of the curricular adaptations may have made it difficult to fully understand how they modified academic progress.

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The author declares that there are no conflicts of interest.

Author's contribution:

The author is responsible for writing the work and analyzing the documents.



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