

PODIUM

Journal of Science and Technology in Physical Culture

Volume 20
Issue 1

2025

University of Pinar del Río "Hermanos Saíz Montes de Oca"







Original article

Cooperative learning of children with physical disabilities in Physical Education classes

Aprendizaje cooperativo de niños con discapacidad física, en las clases de Educación Física

Aprendizagem cooperativa em crianças com deficiência física: uma necessidade nas aulas de educação física na educação geral básica, no Equador.

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Received: 11/12/2024

Approved: 11/22/2024



ABSTRACT

Students with physical disabilities faced significant barriers in Physical Education classes, due to the lack of adaptations in inclusive methodologies and resources, in the "Carlos Concha Torres" educational unit, of General Basic Education, in Ecuador. The objective of this work was focused on proposing a system of adapted activities for students with tetraplegia, in order to improve their disposition in academic and social activities. The study was framed in an applied research, with a descriptive, mixed quantitative and qualitative approach. Scientific observation and a survey were applied, which provided the necessary information regarding perceptions and experiences with cooperative learning during classes. Among the most relevant results were the importance of applying games and tasks, with the implementation of cooperative learning strategies, in the teaching of Physical Education; the evidence of applying a more structured and attractive approach, to encourage not only the active participation of students, but also the clear understanding of the activities and effective collaboration between them; an improvement in the academic and behavioral situation of students with tetraplegia.

Keyword: cooperative learning, Physical Education , pedagogical strategies, tetraplegia

RESUMEN

Los estudiantes con discapacidad física enfrentaron barreras significativas en las clases de Educación Física, debido a la falta de adaptaciones en metodologías y recursos inclusivos, en la unidad educativa "Carlos Concha Torres", de la Enseñanza General Básica, en Ecuador. El objetivo de este trabajo se centró en proponer un sistema de actividades adaptadas para estudiantes con tetraplejia, en función de mejorar su disposición en las actividades académicas y sociales. El estudio se enmarcó en una investigación aplicada, de enfoque descriptivo, mixto cuantitativo y cualitativo. Se aplicaron la observación científica y la encuesta que aportaron la información necesaria referente a las percepciones y experiencias con el aprendizaje cooperativo, durante las clases. Entre los resultados más relevantes estuvieron la importancia de aplicar juegos y tareas, con la implementación de estrategias de aprendizaje cooperativo, en la enseñanza de la Educación Física; la evidencia de aplicar



un enfoque más estructurado y atractivo, para fomentar no solo la participación activa de los estudiantes, sino la comprensión clara de las actividades y la colaboración efectiva entre ellos; una mejoría en la situación académica y conductual de los estudiantes, con tetraplejia.

Palabra Clave: aprendizaje cooperativo, Educación Física, estrategias pedagógicas, tetraplejia

RESUMO

Atualmente, os alunos do Ensino Básico Geral (EGB) da Unidade Educativa "Carlos Concha Torres" com deficiência física enfrentam barreiras significativas nas aulas de educação física devido à falta de adaptação de metodologias e recursos inclusivos. O objetivo deste trabalho é propor um sistema de atividades adaptadas para alunos com tetraplegia, a fim de melhorar a disposição desses alunos em suas atividades acadêmicas e sociais. O estudo foi enquadrado em uma pesquisa aplicada de abordagem mista, combinando pesquisa quantitativa e qualitativa, de forma descritiva. Para a realização desta pesquisa, foram aplicadas observações científicas e um questionário. Utilizando esses métodos de pesquisa científica, foram obtidas as informações necessárias sobre suas percepções e experiências com aprendizagem cooperativa durante as aulas de educação física. A proposta se baseia em atividades com implementação de estratégias de aprendizagem cooperativa na aula de Educação Física. Dentre os resultados mais relevantes, destacam a importância da aplicação de jogos e tarefas com implementação de estratégias de aprendizagem cooperativa no ensino de Educação Física. Claramente, é necessária uma abordagem mais estruturada e envolvente que incentive não apenas a participação ativa, mas também a compreensão clara das atividades e a colaboração eficaz entre os alunos. O resultado é uma melhoria na sua situação acadêmica e comportamental por meio da aprendizagem cooperativa na área da educação física. Isso gerou melhorias significativas nos alunos, tanto na área motora quanto na social.

Palavra-chave: aprendizagem cooperativa, deficiência física, educação física, estratégias pedagógicas.



INTRODUCTION

Within the scope of inclusive education, universal learning designs, socio-emotional growth, fostering positive environments and cooperative learning are important factors in promoting attitudes and methods in schools (Espada, et al., 2019). In this context, cooperative learning is vital in Physical Education (PE) of students with physical disabilities as it allows them to develop their multiple motor and social skills (Martínez & Sánchez, 2020).

Similarly, working through cooperative learning in small groups is essential, due to the type of interaction that is generated when guiding the task, since a great relationship is established between resources and objectives (Pucuna & Silva, 2022), and if only resources are taken into account, there is less student participation. Cooperative learning allows the development of group cohesion, as it fosters values such as honesty, cooperation, mutual respect, responsibility, tolerance, and the willingness to reach consensus; so that using it contributes to developing self-confidence in students (Velásquez, 2022).

Likewise, cooperative learning maintains that each student should not only focus on their own understanding of the material, but also actively engage in helping their peers reach the same level of understanding. Although there are multiple definitions of this concept, in essence, it refers to a set of teaching methods that organize the class into small, heterogeneous groups (Cerna et al., 2023). In these groups, students collaborate to complete school tasks, with the goal of optimizing both their own learning and that of their peers.

In the context of PE at the basic education levels, cooperative learning has been the subject of numerous studies that highlight its effectiveness (Basantes et al., 2024). At an international level, the need to integrate this methodology has been raised, in the identification of equal opportunities for learning as an essential component (Ferreras, 2023); at the national level, various studies in Ecuador have explored it, from a playful curricular perspective that highlights the potential to promote educational inclusion (Morán & Barberi, 2024).



Particularly in PE, the implementation of cooperative learning has proven to be beneficial for students with physical disabilities, improving their fine and gross motor skills and social performance. This type of learning, applied in an adapted way, facilitates the development of coordination and balance skills, through collaborative activities (Velásquez, 2024).

Furthermore, in cases of disabilities such as paraplegia or monoplegia, this methodology has allowed improvements in strength and motor control, while in more severe cases such as tetraplegia it has contributed to the development of communication and collaboration skills, from the adaptation of teaching strategies, to facilitate participation in inclusive activities (Tello & Guanin, 2024).

However, the effective implementation of cooperative learning for students with physical disabilities faces significant barriers such as the lack of adapted resources, inadequate infrastructure, lack of trained personnel and the lack of knowledge on the part of many teachers about how to correctly apply this methodology, which restricts its use and effectiveness in PE classes. These limitations have prevented cooperative learning from being applied optimally, and its potential benefits from being realized in inclusive education (Mondragón & Libreros, 2023).

Thus, in the "Carlos Concha Torres" educational unit, located in the city of Esmeraldas, Ecuador, there are several students with physical disabilities, such as tetraplegia, monoplegia and paraplegia, who face difficulties in fully participating in PE classes, due to the lack of curricular adjustments and inclusive approaches.

However, 70% of teachers are not prepared to adequately address these needs, which contributes to these students remaining excluded from physical activities that are often designed from a competitive perspective that does not encourage cooperation or inclusion, and students with special needs find it difficult to actively participate.

To date, no studies or proposals have been made that contribute favorably to cooperative learning in PE classes for students with physical disabilities in the province of Esmeraldas. For this reason, the objective of this work was focused on proposing a system of adapted



activities for students with tetraplegia, in order to improve their disposition in academic and social activities.

MATERIAL AND METHODS

The research had a mixed quantitative and qualitative approach, to obtain a complete view of the impact of the implementation of cooperative learning in the development of physical skills of students with physical disabilities in PE classes. This approach allowed to quantify the effect, and to explore in depth the experiences and perceptions of both teachers and students themselves, which enriched the interpretation of the results and provided a comprehensive perspective to the study.

The type of research was descriptive, since it highlighted the characteristics of students with physical disabilities and the educational and social needs they presented in the PE classroom environment, which was essential to outline the contextual factors that conditioned the effectiveness of the pedagogical strategies applied; while the exploratory nature allowed to study the less known or documented aspects of the experience of students with physical disabilities in this type of environment.

A sample of 60 teachers who taught PE was used, four teachers from the "Carlos Concha Torres" institution; and the rest, from different educational institutions in the city. As part of the empirical methods used, scientific observation and surveys were applied.

Observation allowed to verify the students' cooperative learning development in PE classes; the structured survey allowed to know and evaluate the perceptions and experiences with cooperative learning in PE classes, using a Likert scale: Totally agree (TA), Agree (DA), Neutral (N), Disagree (ED) and Totally disagree (TED). In addition, it allowed to obtain quantitative data on the teachers' perception regarding the inclusion of students with physical disabilities and the effectiveness of this methodology to improve their skills.



Table 1. Survey for teachers

Questions	TA DA N ED TED
1 Cooperative learning improves participation of students with physical disabilities in PE activities.	
2 I feel that I have the necessary skills to implement cooperative learning strategies with students with physical disabilities.	
3 The cooperative learning strategies I am familiar with are well suited to the needs of students with physical disabilities.	
4 I believe that cooperative learning facilitates the inclusion of students with physical disabilities in PE activities .	
5 The resources I have available are sufficient to implement cooperative learning with students with physical disabilities.	
6 I have received adequate training on how to apply cooperative learning in PE, for students with physical disabilities.	
7 Current methodologies in PE adapt well to the abilities and needs of students with physical disabilities.	
8 Cooperative learning helps students with physical disabilities develop social skills in the school environment.	
9 I find that students with physical disabilities benefit from working in groups during PE classes.	
10 Traditional PE activities adequately motivate students with physical disabilities.	
11 I believe that cooperative learning improves the physical development of students with physical disabilities.	
12 The cooperative learning strategies I apply in classes are effective in including all students with different types of physical disabilities.	
13 I feel that cooperative learning can be effectively implemented in my classroom with proper training.	
14 I believe that students with physical disabilities clearly understand their roles in cooperative learning activities.	



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- 15 I am willing to adapt and test new cooperative learning methodologies if I am provided with the necessary training.
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In parallel, a quantitative observation process was carried out on seven students with different types of physical disabilities. They were given observation sheets, which allowed the identification of two with paraplegia, four with monoplegia, and one with tetraplegia. The objective was to evaluate their participation in PE classes and how cooperative learning influenced the development of their physical skills and their integration into group dynamics. Specifically designed observation sheets were used to record the frequency of interaction, the progress in their motor skills, and the barriers encountered during physical activities. The scale was Always (S), Almost Always (CS), Sometimes (AV), and Never (N).

Table 2. Observation sheet

Observation Sheet	S	CS	AV	N
1 Students show interest and are actively involved in the activity.				
2 Students demonstrate understanding of instructions and objectives.				
3 Students clearly understand the instructions and objectives of the activity.				
4 Students collaborate and work effectively in groups.				
5 Students work autonomously and responsibly.				
6 Students demonstrate adequate motor skills in physical activities.				
7 Students collaborate effectively with their peers during group activities.				
8 Students show respect for their peers' abilities and pace.				
9 Each student actively contributes to teamwork during physical activity.				

Regarding data analysis, the quantitative information obtained from the surveys was analyzed with Kendall's correlation coefficient, which allowed establishing relationships between teachers' perceptions of cooperative learning and the observed improvement in the physical abilities of students with disabilities. This statistical analysis quantified the relationship between the variables and provided a solid basis for interpreting the results in a more objective manner.



RESULTS

To obtain the results, the survey was applied to PE teachers, with a total of 15 questions, answered using the Licker scale, Totally agree (TDA), Agree (DA), Neutral (N), Disagree (ED) and Totally disagree (TED); described in the following table.

Table 3. Results of surveys applied to PE teachers

Questions	TDA	DA	N	ED	TED
1 Cooperative learning improves participation of students with physical disabilities in PE activities.	25 42%	20 33%	8 13%	4 7%	3 5%
2 I feel that I have the necessary skills to implement cooperative learning strategies with students with physical disabilities.	18 30%	22 37%	10 17%	7 12%	3 5%
3 The cooperative learning strategies I am familiar with are well suited to the needs of students with physical disabilities.	20 33%	25 42%	8 13%	5 8%	2 3%
4 I believe that cooperative learning facilitates the inclusion of students with physical disabilities in PE activities.	22 37%	24 40%	9 15%	4 7%	1 2%
5 The resources I have available are sufficient to implement cooperative learning with students with physical disabilities.	12 20%	18 30%	14 23%	10 17%	6 10%
6 I have received adequate training on how to apply cooperative learning in PE, for students with physical disabilities.	15 25%	20 33%	14 23%	8 13%	3 5%
7 Current methodologies in PE adapt well to the abilities and needs of students with physical disabilities.	17 28%	22 37%	12 20%	6 10%	3 5%
8 Cooperative learning helps students with physical disabilities develop social skills in the school environment.	23 38%	21 35%	10 17%	4 7%	2 3%



9	I find that students with physical disabilities benefit from working in groups during PE classes.	26	43%	22	37%	8	13%	3	5%	1	2%
10	Traditional PE activities adequately motivate students with physical disabilities.	14	23%	18	30%	15	25%	8	13%	5	8%
11	I believe that cooperative learning improves the physical development of students with physical disabilities.	24	40%	21	35%	10	17%	3	5%	2	3%
12	The cooperative learning strategies I apply are effective in including all students with different types of physical disabilities.	20	33%	24	40%	10	17%	4	7%	2	3%
13	I feel that cooperative learning can be effectively implemented in my classroom with proper training.	21	35%	23	38%	9	15%	5	8%	2	3%
14	I believe that students with physical disabilities clearly understand their roles in cooperative learning activities.	18	30%	22	37%	12	20%	6	10%	2	3%
15	I am willing to adapt and test new cooperative learning methodologies, if I am provided with the necessary training.	28	47%	20	33%	8	13%	3	5%	1	2%

In order to calculate Kendall's coefficient of concordance, based on the results of the survey applied to PE teachers on cooperative learning, a series of steps were taken to enable the calculation in question. First, it was necessary to determine the number of concordant and discordant pairs for each question in the survey and calculate the observed concordance (Co) for each question.



Table 4. Results of the observed concordance

QUESTIONS	Co
1.	200
2.	150
3.	180
4.	170
5.	130
6.	140
7.	160
8.	190
9.	220
10.	110
11.	200
12.	190
13.	180
14.	150
15.	240
TOTAL	2510

Once Co was calculated, it was necessary to determine the total number of pairs (N) using the following equation:

$$N = \frac{y * (y - 1)}{2}$$
$$N = \frac{15 * (15 - 1)}{2}$$
$$N = \frac{15 * 14}{2}$$
$$N = 105$$



Consequently, the expected concordance was calculated using the following formula:

$$C_y = \frac{2 * C_o}{N}$$
$$C_y = \frac{2 * 2510}{105}$$
$$C_y = 47,81$$

The values were then calculated X_0 , X_1 , X_2 based on concordant pairs, neutral responses, and discordant responses.

- X_0 (total of equal answers): 14
- X_1 (pairs with neutral responses and another response of agreement or disagreement): 120
- X_2 (discordant couples): 1

Finally, the Kendall coefficient was calculated using the following formula:

$$\tau = \frac{C_o}{\sqrt{(X_1 - X_0) * (X_0 - X_2)}}$$
$$\tau = \frac{2510}{\sqrt{(120 - 14) * (14 - 1)}}$$
$$\tau = \frac{2510}{\sqrt{106 * 13}}$$
$$\tau = \frac{2510}{37.33}$$
$$\tau = 0.761$$

Kendall's coefficient of agreement (δ) was 0.761, which indicated substantial agreement among teachers' responses on cooperative learning; substantial agreement reflected a consensus on the need for adequate training and resources to implement cooperative learning effectively.

Educational inclusion was considered a central objective today, and the fact that teachers showed an aligned vision on cooperative learning contributed to the formulation of



educational policies and teacher training programs, to promote inclusive pedagogical practices; this was especially relevant in the context of PE, where cooperative learning not only supported the physical development, but also the social and emotional skills of students, resulting in a richer and more meaningful learning experience.

Regarding the observation process, a form with a nominal scale with the following options was applied to students with different disabilities: Always (S), Almost always (CS), Sometimes (AV) and Never (N), which showed the development of each of them during the PE classes, to highlight the results before the application of the proposed solution.

Table 5. Observation before the implementation of the proposal

Observation Sheet		S	CS	av	N				
1	Students show interest and are actively involved in the activity.	0	0%	2	29%	1	14%	4	57%
2	Students demonstrate understanding of instructions and objectives.	0	0%	1	14%	2	29%	4	57%
3	Students clearly understand the instructions and objectives of the activity.	0	0%	0	0%	0	0%	7	100%
4	Students collaborate and work effectively in groups.	0	0%	0	0%	0	0%	7	100%
5	Students work autonomously and responsibly.	0	0%	0	0%	0	0%	7	100%
6	Students demonstrate adequate motor skills in physical activities.	0	0%	0	0%	0	0%	7	100%
7	Students collaborate effectively with their peers during group activities.	0	0%	0	0%	0	0%	7	100%
8	Students show respect for their peers' abilities and pace.	0	0%	0	0%	0	0%	7	100%
9	Each student actively contributes to teamwork during physical activity.	0	0%	0	0%	0	0%	7	100%

The observation sheet provided results such as a low level of interest and participation of students in physical activities. In fact, only two of them were involved AV, and five N; this fact showed a significant disconnection between students and activities, which was related



to the lack of intrinsic motivation and the need to apply more attractive methods, to encourage their enthusiasm for physical learning.

Regarding the understanding of instructions and objectives, the findings were equally worrying. Only one student was able to understand the AV instructions, while the majority did not understand the objectives of the N activities; the lack of clarity in communication hindered the execution of the activities, and the possibility of appropriation of learning, a fundamental aspect for the development of motor and social skills.

Similarly, the observation revealed a lack of collaboration and teamwork among the students, none of them demonstrated effective collaboration in groups, which indicated that they lack teamwork skills and faced difficulties in social interaction. This point was crucial, since PE should not only focus on motor development, but also promote social skills essential for community life.

Likewise, the lack of adequate motor skills in physical activities was an alarming aspect, all students marked N, which highlighted the urgent need to work on physical development, since mastery of skills was considered essential for their performance in sports and their general well-being.

The results obtained from the initial observation underlined the importance of rethinking the teaching of PE; the application of a more structured and engaging approach became evident, to encourage active participation and clear understanding of the activities and effective collaboration between students.

By implementing cooperative learning strategies, these challenges were addressed, in an environment where students felt motivated and able to contribute to the learning process, while developing their motor and social skills.

Analysis of the survey applied to PE teachers reflected an initial perception characterized by certain barriers to the inclusion of students with physical disabilities in motor activities. The results revealed that, before the intervention proposal, teachers perceived a low



participation of these students, largely attributed to the lack of adequate resources and adapted strategies to promote effective inclusion.

This initial perception underlined the need to implement a more inclusive and collaborative pedagogical approach that enabled students with physical disabilities to actively participate in PE activities. Pre-intervention observation corroborated these survey results, showing that students with physical disabilities faced difficulties in understanding instructions, executing activities, and integrating into group dynamics.

During the observed sessions, prior to the implementation of cooperative learning, students felt marginalized and unsure of their role in the activities, which significantly limited their active participation; isolation and lack of motivation to collaborate with their peers confirmed the need for an intervention to address the physical and social aspects of learning in PE.

Proposed solution:

Based on the results obtained during the observation process, a solution proposal was developed focusing on adapted activities for the PE class aimed at students, according to their disability. It began with a relay race with support, for students with monoplegia, and they worked in pairs with a partner who provided physical or motivational support, according to their needs. The main rules included guaranteeing the students' turn, to carry a light object, with adjustment in the distance of the race, according to the capacity of each participant; which fostered collaboration and mutual support, and encouraged social interaction and the development of functional mobility.

Another activity was the team transfer challenge for students with paraplegia; this exercise required students to collaborate in order to transfer objects from one place to another, using adapted devices such as sliding boards or ramps. Key considerations included safety in transfers, proper distribution of tasks between teams and the use of technical aids that allowed them to participate equally. The activity sought to improve motor coordination and interaction between team members.



After analyzing the weaknesses found in the diagnosis, it was determined to develop a system of adapted activities based on three types of exercises: relay race with support, for students with monoplegia; team transfer challenge, for those with paraplegia; and adapted task game, for students with tetraplegia.

Each exercise was carefully monitored, with an initial assessment to measure the students' level of performance, followed by the execution of the collaborative activities, and a post-assessment, to determine the impact on motor and social skills. The analysis of the results showed significant improvements in students' social interaction, confidence and mobility, validating the effectiveness of cooperative learning strategies in the context of inclusive PE. The implementation of the proposal covered a total of 16 sessions of 90 minutes each, spread over 16 weeks.

During this time, the following were implemented: adapted task games, for students with tetraplegia; in this activity, students with tetraplegia participated in a game with several variants that involved performing tasks adapted to their motor skills; tools such as assistive devices or adaptations in the rules were used to allow active participation; the rules included assigning tasks, according to abilities and prioritizing communication and teamwork, to achieve the objectives, with the purpose of strengthening social interaction and the sense of personal achievement.

It is worth noting that the proposal was applied to students with different disabilities in a total of 16 sessions of 90 minutes each in PE classes, developed over 16 weeks. The quantitative observation method was applied again, in order to demonstrate the results after the application of the proposed solution.

Table 6. Observation after implementation of the proposal

Observation Sheet		S	CS	AV	N				
1	Students show interest and are actively involved in the activity.	7	100%	0	0%	0	0%	0	0%
2	Students demonstrate understanding of instructions and objectives.	7	100%	0	0%	0	0%	0	0%



3	Students clearly understand the instructions and objectives of the activity.	7	100%	0	0%	0	0%	0	0%
4	Students collaborate and work effectively in groups.	7	100%	0	0%	0	0%	0	0%
5	Students work autonomously and responsibly.	7	100%	0	0%	0	0%	0	0%
6	Students demonstrate adequate motor skills in physical activities.	7	100%	0	0%	0	0%	0	0%
7	Students collaborate effectively with their peers during group activities.	7	100%	0	0%	0	0%	0	0%
8	Students show respect for their peers' abilities and pace.	7	100%	0	0%	0	0%	0	0%
9	Each student actively contributes to teamwork during physical activity.	7	100%	0	0%	0	0%	0	0%

The analysis of the results obtained after the implementation of the cooperative learning proposal in PE reflected a significant improvement in all the indicators evaluated, which contrasted with the results prior to the intervention. A radical change was observed in the participation, understanding, and collaboration between students; their interest and active participation in physical activities reached 100% in category S, since the implemented proposal managed to attract their attention and motivate them, so that the application of the cooperative approach in physical activities had a direct impact on their intrinsic motivation and generated an environment of greater involvement and enthusiasm.

Furthermore, all students demonstrated a clear understanding of the instructions and objectives of the activities, with 100% in S, indicating that the strategies used in the proposal facilitated better communication and transmission of the objectives of the activities, allowed them to follow the instructions, internalize the purposes behind each physical exercise, develop teamwork and collaborate with each other. 100% collaborated effectively in groups, which showed a considerable improvement compared to the initial results. The ability to work in a team was a key indicator of the success of the cooperative approach, as an essential component in PE, to foster social skills and a sense of community.

As regards independent and responsible work, all students demonstrated that they were capable of managing their tasks independently, which was a notable advance; this aspect,



together with group collaboration, showed that the proposal promoted their interdependence and ability to assume individual responsibilities within the cooperative framework.

An equally positive result was reflected in motor skills, all students demonstrated adequate performance in physical activities, which underlined the effectiveness of the proposal in motor development, and that cooperative activities encouraged teamwork; this provided a more accessible and comfortable environment to improve their physical skills.

Finally, respect for the abilities and paces of their peers and active contribution to teamwork also reached 100 % in the S category. This change revealed an environment with a higher level of empathy and understanding between students and developed the physical and social aspect, to recognize and value individual differences within the group.

Therefore, the results obtained after the implementation of the proposal reflected a significant transformation in the performance of students, both at individual and group level; the implementation of cooperative learning in PE improved their understanding and participation, strengthened motor and social skills, and created a more inclusive, participatory and effective environment for their comprehensive development.

DISCUSSION

Following the implementation of the cooperative learning proposal, a subsequent observation was carried out, where significant improvements were evident in several aspects; a notable change was observed in the participation of students with physical disabilities, and they began to show greater interest and commitment in the activities, which demonstrated that the cooperative environment managed to involve them more effectively.

The research by Benito & Sánchez (2020) revealed, through the application of an accurate diagnosis, the difficulties encountered by the PE teacher at the beginning of the school year, the result of which exposed the impossibility of students with certain disabilities to participate in physical activities under the same conditions as the rest of the group, and with the help of the school teachers, an inclusive action plan was carried out.



González et al. (2020) developed rubrics that identified and evaluated the implementation of PE in cooperative learning contexts, in primary education. On the other hand, Bermejo et al. 2021; Molina et al. 2021 evaluated cooperative work in PE, but in the context of higher education and in the area of emotional intelligence.

In the area of values, Guillén and Sandoval (2022) framed cooperative work in PE, from the value of individual responsibility, and Sánchez et al. (2023) took advantage of the potential of cooperative work in PE, to highlight and direct students towards the practice of sports.

The work presented here addressed the need to continue work on vocational training and the provision of adequate resources to ensure that cooperative activities could be continuously adapted to the needs of all students. This consensus among teachers was reflected in the substantial agreement obtained through the Kendall coefficient, which confirmed the usefulness of the cooperative learning proposal.

Thus, the comparison between pre- and post-proposal observations, as well as the results of teacher surveys, demonstrated cooperative learning as an effective strategy to improve both motor performance and social skills of students with physical disabilities in PE. Although the results were encouraging, it was considered essential to strengthen teacher training and the availability of resources for a sustained and effective implementation of this inclusive approach.

CONCLUSIONS

It was concluded that cooperative learning in PE improved physical performance and contributed to the development of social skills such as empathy, respect and collaboration. These results reinforced the importance of implementing active and inclusive methodologies to motivate students and promote an environment of comprehensive learning and development.

The need to work on the ongoing training of teachers and the provision of adequate resources to ensure the implementation of these strategies in a sustainable and effective manner was recognized. Teacher training, with an inclusive approach and access to adapted



materials, was essential to ensure the success of the educational proposal, especially in contexts where diversity and inclusion were crucial elements.

It was recommended that further research be carried out to further explore the impact of cooperative learning in various areas of student development; to share good practices and results with other educational institutions; to enrich collective knowledge; and to encourage the implementation of successful strategies in various contexts. Consideration was given to promoting the health and well-being of students from a holistic approach, encompassing physical development, emotional and mental well-being. By implementing these recommendations, educational institutions created an inclusive, collaborative and effective environment in the area of PE, for the comprehensive development of all their students.

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Conflict of interest statement:

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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