

Original Research

## Physical Education: Equity of Learning and Social Inclusion for Blind Students

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### Abstract

Equity in the educational system is crucial to addressing the needs of all students without distinction, from their initial access to education through to graduation. Achieving equity requires implementing reasonable adjustments to ensure that all students can attend classes, actively participate, and learn effectively. Equity entails transforming inequality into inclusion, enhancing students' well-being and quality of life. Education for all prioritizes equity and quality as fundamental principles of the educational process. The objective of this research was to analyze the perceptions of Physical Education teachers regarding classroom activities that promote learning equity and the social inclusion of blind students. The study employed a



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non-experimental design, focusing on various variables. A Likert-scale instrument was administered to 66 Physical Education teachers, comprising 29 women and 37 men from schools across an educational region. The findings revealed that, according to the teachers' responses, 83% of female teachers and 84% of male teachers reported promoting equity and the social inclusion of blind students, indicating no significant gender differences. In conclusion, a substantial percentage of activities in the Physical Education curriculum promote learning equity and the social inclusion of blind students.

### **Keywords**

Learning; sports for all; equity; inclusive education; physical education

## **1. Introduction**

Sport has emerged as a vital educational tool for promoting inclusion and equal opportunities, acting as a medium to foster genuine integration among students [1, 2]. An egalitarian educational system is characterized by allocating more significant resources to groups in vulnerable situations [3]. Inequity, by definition, refers to the lack of proportional equality. According to Sarrionandia [4], one of the central challenges of inclusive education lies in reconciling the right to equality with the principle of equity. It is widely acknowledged that the moral principle of equal dignity and rights for all individuals, regardless of their condition, has gained strength. Equality functions as a value and an ethical principle, forming a foundational condition for overcoming vulnerability and constructing a dignified life plan [4].

Equity, however, ensures that all students are not only present in classrooms but are equally valued and respected [5]. Regarding educational quality, equity involves providing all students with meaningful and high-quality learning opportunities within their communities [6, 7].

Since 1994, the World Conference on Special Educational Needs: Access and Quality (UNESCO) has driven significant changes in educational approaches. The guiding principle established during the conference asserts that schools must accommodate all children, irrespective of their physical, intellectual, social, emotional, or other conditions. Inclusive education is linked to diversity, rights, opportunities, effective teaching practices, and social participation [3, 8].

Advancing human rights is imperative, as emphasized in the Convention on the Rights of Persons with Disabilities [9] Article 24 underscores the need for a systemic education transformation to embrace inclusivity at all levels. This highlights the urgency of prioritizing equity and equal opportunities as fundamental pillars of education.

## **2. The Role of Physical Education in Inclusion**

Physical Education (PE) plays a pivotal role in promoting individual well-being across all domains of knowledge. Within the school context, PE directly influences the development of social, personal, and group behaviours [10]. It emphasizes the enhancement of physical capacities and sports skills, along with optimal motor development, providing students with opportunities to nurture their personal and social sensitivity.

Participation in PE helps students improve their self-esteem and develop physical competencies while fostering a spirit of healthy competition. Success is celebrated without disregarding the emotions of others in defeat [11, 12]. As a relevant subject in the lives of all students, PE stimulates creativity beyond the constraints of rigid behavioural patterns. It establishes meaningful connections with the school environment, encouraging communication transcending superficial and irrelevant interactions [13, 14].

Physical Education transforms into purposeful action, embodying personal skills and fostering opportunities for students to recognize and appreciate the value of collaboration with classmates [15]. Beyond developing physical and motor skills, PE influences affective, social, cognitive, moral, and spiritual domains, contributing to the holistic development of individuals [16].

PE has garnered significant interest in education due to its multidimensional nature, which encompasses:

- **Theoretical knowledge**, such as methods to improve muscle strength or aerobic endurance;
- **Practical knowledge** acquired through movement-based activities, including decision-making in specific game conditions;
- **Social values**, such as overcoming challenges, fostering respect, and promoting interdisciplinary learning [8].

PE is a critical source of opportunities for students facing challenges related to mobility, bodily expression, motor development, and the formation of physical activity habits [17, 18]. It extends beyond the teaching of motor skills and abilities, focusing on the comprehensive development of each individual [19].

### **2.1 Inclusive Physical Education**

Physical Education (PE) educators bring extensive expertise to their role, striving to maximize the potential of every student. Sports and activities, such as Goalball, are specifically designed to accommodate students with visual disabilities. Educators can modify curriculum elements, organizational structures, and resources when specialized materials are unavailable to ensure accessibility. Above all, students deserve guaranteed opportunities to live fully and enjoy equal recreational access, particularly within the public education system [20].

Adapting PE for inclusivity involves:

- Ensuring that all students can participate through necessary adjustments;
- Establishing effective communication methods, such as using simple and detailed language;
- Verbally describing activities, discussing environmental elements, and providing tactile guidance to support execution [21].

These adaptations exemplify equity in PE, ensuring that all students have access to the same resources and opportunities as their peers.

### **2.2 Sport as a Catalyst for Inclusion**

Sport serves as a central pillar for inclusion and teamwork. The principle of inclusion encompasses complex interactions, with relationships between individuals and groups forming the core of an ongoing transformational process. This dynamic context necessitates interdisciplinary approaches, particularly in integrating physical activities and adapted sports [22].

The process of inclusion inherently requires reshaping perceptions both within and between groups. To promote inclusion effectively, it is essential to implement strategies that enhance the quality of life and well-being through adapted sports. This includes managing and transforming group beliefs to foster new, shared understandings [23].

### ***2.3 The Importance of Research and Practice in Inclusive Education***

The inclusion of students with disabilities has been extensively studied in recent years, with research revisiting the opportunities provided by physical activities, sports, and recreation to achieve inclusion goals [8]. Education and physical culture play essential roles in fostering the motor, cognitive, and emotional skills needed for students to acquire knowledge, engage with the physical world, and fully integrate into society [24].

Learning, skills, and emotions are foundational components of students' lives, representing the overarching objectives across all subjects in the curriculum. Educational inclusion aims to create an inclusive school environment that fosters effective inclusive practices and a culture of acceptance and solidarity. It is vital to cultivate a community where all students learn together, regardless of their personal, social, or cultural circumstances. This includes students with disabilities or other challenges that may impact their performance in subjects such as Physical Education [25].

An inclusive school adheres to established regulations that guarantee access to education for all [9]. Such schools eliminate entry requirements, selection mechanisms, or discrimination [25, 26].

### ***2.4 Perspectives on Inclusion in Physical Education***

Hernández-Beltrán et al. [27] examine the perspectives of Physical Education (PE) teachers on administrative policies and protocols for supporting students with disabilities. The presence of clear procedures enhances teacher confidence, although challenges and barriers may persist. Their findings highlight the need for future interventions, particularly in areas like adapted sports. Similarly, Guntoro et al. [28] discuss how the digital teaching of Physical Education during the global health crisis shaped teachers' ability to leverage accessibility tools on platforms to deliver content interactively and dynamically.

The research problem centers on understanding the perceptions of PE teachers regarding classroom activities that promote equity in learning and the social inclusion of students, especially those with visual impairments, within the Panamanian education system. The study aims to determine whether these activities are perceived as practical tools for fostering inclusion and equitable learning opportunities for all students, particularly those with disabilities.

Research on physical education activities provides valuable insights into fostering equity in learning and the social inclusion of students with disabilities, particularly visual impairments. While existing studies address inclusive educational practices as the role of sports in promoting social integration [10, 11] the practical application of inclusion from the perspective of PE teachers remains underexplored. This study seeks to bridge that gap by examining teachers' perceptions and identifying opportunities for enhancing inclusion through physical education.

## **2.5 Challenges and Barriers to Inclusive Physical Education**

Future studies could examine the impact of various adapted sports, such as Goalball or adapted futsal, in promoting social inclusion among visually impaired students. Longitudinal research tracking students and teachers over time would offer valuable insights into the evolution of inclusive practices in physical education and their long-term effects on student outcomes. Comparative studies across diverse educational contexts—such as urban, rural, and Indigenous school settings—could shed light on differences in implementing inclusive practices in PE. Additionally, research into teacher training and resource availability could evaluate the effectiveness of training programs and the adequacy of resources in fostering an inclusive physical education environment for students with disabilities.

This study is particularly significant as it addresses a less-explored aspect of inclusive education: the role of physical education in promoting equity and social inclusion for students with disabilities. Given the dual contribution of physical education to physical and social development, understanding how teachers perceive and implement inclusive practices can inform policies and interventions to ensure that all students, including those with disabilities, have equal opportunities to participate.

Moreover, addressing the equity gap in education is essential to achieving international standards for inclusive education, as outlined by the United Nations and other global frameworks. This study contributes to these efforts by emphasizing the importance of inclusive practices in physical education and their potential to advance equity and social inclusion on a broader scale.

## **2.6 Teacher Experience and Training in Inclusive Education**

Factors such as years of experience, specialized training, and the availability of support significantly influence teachers' perceptions of including blind students in Physical Education (PE). Teachers with extensive experience, training in inclusion, and access to resources generally hold more positive perceptions and feel better equipped to meet the diverse needs of their students.

Years of teaching experience often lead to a deeper understanding of students' needs, enabling teachers to provide more effective instructional responses. More excellent experience typically correlates with more positive perceptions, as seasoned teachers have had more opportunities to witness the benefits of inclusion for all students, including those with visual impairments. However, experienced teachers without specific training in inclusive education may perceive inclusion as a challenge, particularly if they lack the knowledge or resources to adapt their PE classes for blind students.

Specialized training in adapted physical education is crucial for fostering positive attitudes toward the inclusion of visually impaired students. Teachers trained in inclusive strategies often feel more confident and capable of adapting their classes to accommodate all learners. Conversely, the absence of such training can result in negative perceptions or heightened uncertainty about the feasibility and effectiveness of inclusion in PE. Teachers without adequate preparation may feel ill-equipped to teach blind students effectively, leading to frustration and lower confidence in their ability to provide high-quality education.

The availability of support further influences teachers' perceptions. Those who receive adequate resources, guidance, and institutional backing are more likely to view inclusion positively, feeling empowered to adapt lessons and environments. In contrast, the lack of support can foster negative

perceptions, with teachers viewing inclusion as an additional burden or a difficult challenge to manage. When teachers are required to make adjustments without sufficient support, their efforts may be hindered, ultimately affecting the quality of education provided to all students.

### **2.7 Comparative Challenges in Physical Education and Language Learning**

Comparing physical education with learning English for blind students reveals similar challenges. Blind students face significant barriers in learning English as a second language. Case studies have identified obstacles such as a lack of adapted materials, limited access to assistive technologies, and reliance on visually-centered teaching methods. These findings highlight the need to adapt curricula and pedagogical approaches to meet these students' needs and ensure an inclusive and practical learning experience [29]. Similarly, in physical education, teachers face challenges due to the lack of specific resources and adaptations for blind students, limiting their ability to provide an inclusive experience. In both contexts- English classrooms and physical education-the lack of appropriate materials negatively affects perceptions of inclusion and the success of learning.

Language and educational barriers affecting blind students in English teaching contexts may be influenced by a lack of specific teacher training and the absence of adequate infrastructure, which hinder these students' learning. The authors emphasize the importance of teacher training in inclusive practices and recommend implementing accessible technologies to reduce existing barriers [30].

The use of assistive technologies in language acquisition for blind students highlights that tools like screen readers and voice recognition software are essential for learning English. Limitations in the availability and accessibility of such technologies in educational settings are significant. Increased investment in teacher training for effective use of these tools can improve learning outcomes for visually impaired students [31]. In physical education, while technology is less central than language teaching, adapted resources such as audible balls or physical guides play a similar role.

In both language teaching and physical education, the availability of technology and adapted materials positively influences perceptions of inclusion by facilitating participation and learning for visually impaired students.

### **2.8 Ethics Statement**

The manuscript is filled with ethical and editorial guidelines.

## **3. Theoretical Framework for Inclusive Education**

Exploring how schools can improve practices to support students with diverse needs [32], including the need for appropriate training, granting both a proper level of education and social inclusivity. Florian [33] analyzed the distinction between special education and inclusive education, providing a conceptual framework to understand how inclusive practices can better meet the needs of students with disabilities in general education contexts. The foundations of inclusion in social and educational contexts are addressed, focusing on how policies and practices can promote inclusion [34]. A critical framework for inclusive education examines how schools can address inequalities and adopt more inclusive approaches [35]. Research findings highlight the importance of an

inclusive approach to improving educational equity [36]. UNESCO's guidelines [9] provide theoretical and practical frameworks for inclusive education, offering guidance to educational systems to implement inclusive policies worldwide. Teachers' attitudes toward inclusion are also reviewed, providing a theoretical basis for understanding how their perceptions influence inclusive practices [37].

### **3.1 Importance of the Study and Participant Contributions**

This study is important for its contribution to inclusion among schools of a kind of scholars with this issue.

### **3.2 Hypotheses and Objectives**

**The hypothesis (H1)** asserts that, according to the opinions of Physical Education teachers, activities promote equity and social inclusion for students who are blind. This hypothesis is supported by the results, with 83% of female and 84% of male teachers affirming its validity.

**The null hypothesis (H0)**, which posits that, according to the opinions of Physical Education teachers, activities do not promote equity and social inclusion for students who are blind, was rejected based on the findings.

The objectives of the study were as follows:

1. **Evaluate Physical Education teachers' perceptions** of the activities that promote learning equity and social inclusion in General Basic Education.

○ **Specific Objectives:**

- Analyze Physical Education teachers' perceptions of the effectiveness of activities in promoting learning equity and social inclusion for blind students.
- Compare the principles of equity and social inclusion presented in the scientific literature with the practices implemented by teachers working with visually impaired students in General Basic Education.
- Statistically assess the outcomes of General Basic Education teachers' equity and social inclusion approaches when teaching Physical Education to students with visual disabilities.

## **4. Methodology**

The research explored teachers' perspectives on learning equity and social inclusion in Physical Education for blind students. This study employed a non-interventional design to evaluate a single moment in time, maintaining a presumed state of neutrality [29].

The sample included 66 educators (29 women and 37 men), all Physical Education teachers from the North Educational Region of Panama. Participants were primary school teachers with experience teaching students with disabilities, including those with visual impairments, at some point in their careers. Data collection took place using a mixed-methods approach during the second semester of the 2023 academic year.

This descriptive study aimed to investigate the state of variables within the selected population at a specific time. To strengthen the scientific rigor, statistical tools and techniques were employed.

The reliability of the questionnaires was evaluated using Cronbach's Alpha, alongside linear regression to analyze the results.

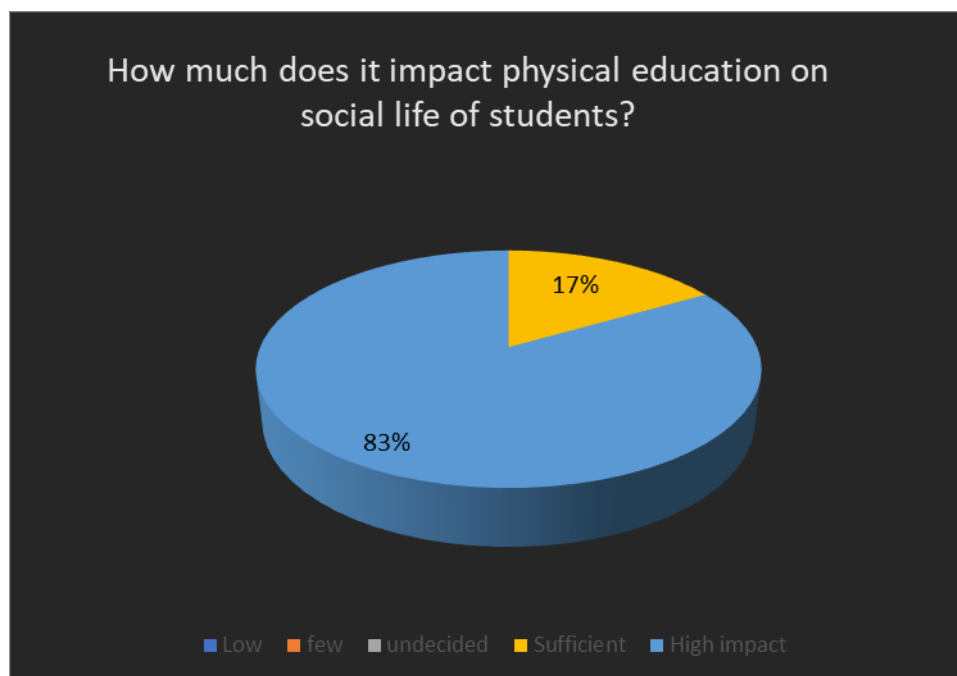
Data were collected digitally via Google Forms, with a questionnaire consisting of 40 items rated on a 5-point Likert scale (1 = totally disagree, 5 = totally agree)—the method aimed to address causal relationships by answering the question of "why" certain phenomena occur.

The reliability of the 22-item questionnaire, as measured by Cronbach's Alpha, was 0.613, indicating weak internal consistency overall. When items were divided into subscales, reliability improved for specific groups:

- For the six items measuring the importance of Physical Education as an independent variable, Cronbach's Alpha was 0.694.
- For the remaining 16 items assessing the inclusiveness of students with disabilities, the reliability value was notably lower at 0.076.

## 5. Results

Regarding the impact of Physical Education on the social life of blind students, the distribution of responses indicates a significant influence (Figure 1). Specifically, 83% of teachers believe that Physical Education has a substantial impact on the social life of blind students, while an additional 14% consider its effect to be considerable. This demonstrates a strong consensus among educators, with 97% acknowledging the positive role of Physical Education in promoting the socialization of blind students.



**Figure 1** Evaluation of importance of physical education for students' social life.

### 5.1 Linear Regression

We evaluated the statistical correlation between attitudes toward Physical Education (independent variable) and the inclusion process (dependent variable) (Table 1 & Table 2). The analysis revealed a weak direct relationship, with an R value of 0.0904 and an R<sup>2</sup> value of 0.00817.



This indicates that attitudes toward Physical Education explain only 0.8% of the variance in the inclusion process. These findings suggest that Physical Education offers valuable opportunities for social interaction and inclusion, but its impact on the broader inclusion process is limited.

**Table 1** Significancy for correlation between physical education and inclusion process.

Model	R	R <sup>2</sup>
1	0.0904	0.00817

**Table 2** Powerness for statistical model.

Models				
Predictor	Statistical estimate	SE	t	p
Interception	4.0855	0.3111	13.135	<0.001
Physical education attitude	-0.0559	0.0769	-0.726	0.470

Notably, the absence of negative responses underscores the positive perception of Physical Education’s importance for blind students. This suggests that Physical Education can serve as an effective tool for promoting social inclusion in educational settings.

The results justify allocating resources to adapt and enhance Physical Education classes for visually impaired students. The analysis highlights the subject’s significant potential in fostering social inclusion and development, reinforcing its critical role in the social lives of blind students.

## 5.2 Challenges in Learning Equity

### 5.2.1 Regarding Learning Equity

The survey results reveal that only 41% of female teachers reported that blind students always or almost always have access to a safe space for movement during Physical Education classes. Male teachers responded similarly, highlighting consistent deficiencies in ensuring safe movement spaces for blind students within Physical Education settings.

### 5.2.2 In Terms of Support During Activities

79% of surveyed teachers indicated that blind students receive adequate assistance during Physical Education activities. This reflects a strong level of support, which is essential for fostering a more inclusive learning environment and ensuring equitable participation for visually impaired students.

## 5.3 Social Inclusion through Physical Education

### 5.3.1 Regarding Social Inclusion

59% of teachers consistently indicated that sports such as swimming play a significant role in facilitating social inclusion for blind students, with no statistical differences between male and female respondents. Similarly, Goalball was highly regarded, with 87% of surveyed teachers affirming its positive impact on the social inclusion of blind students. For indoor soccer (futsal), 76%

of teachers agreed that it promotes social inclusion, with comparable views expressed by male and female teachers.

These findings underscore a strong consensus among educators about the potential of Physical Education to enhance social inclusion for blind students. They highlight the importance of developing inclusive practices and allocating appropriate resources to ensure equitable opportunities for all students, regardless of disability, to participate fully and succeed in Physical Education activities.

## **6. Discussions and Conclusions**

The participants in this study, as Physical Education teachers with experience working with students with disabilities, play a crucial role in advancing knowledge in inclusive education. Their direct interactions with visually impaired students offer practical insights and real-world experiences that help bridge gaps in the literature on inclusive Physical Education practices.

### **6.1 Key Contributions of the Study**

Teachers' perceptions of how Physical Education activities promote equity and social inclusion provide essential insights often underrepresented in academic research. Their feedback is invaluable for identifying effective strategies and areas requiring further adaptation to better support students with disabilities. Teachers' perspectives reveal critical barriers to inclusion, such as limited resources and insufficient training, while highlighting successful practices that foster inclusion within Physical Education. These insights are fundamental for refining teaching approaches and shaping more effective inclusive education policies.

The experiences shared by educators can serve as a valuable resource for policymakers and curriculum developers. Their first-hand knowledge of the challenges and needs in inclusive Physical Education offers guidance for designing more effective teacher training programs, improving resource allocation, and making curricular adjustments. Such efforts aim to enhance accessibility and ensure that Physical Education benefits all students, including those with disabilities.

### **6.2 Enhancing Teacher Training and Curriculum Design**

The knowledge generated by this study can significantly contribute to developing teacher training programs to address specific gaps in skills and understanding related to inclusive Physical Education. By focusing on the real challenges and successes experienced by educators, such programs can be better aligned with classroom realities and the practical needs of teachers and students.

### **6.3 Participant Demographics and Professional Background**

Participants were recruited from diverse educational contexts, with 82% working in urban schools, 15% in rural settings, and 2% not providing location data. The teaching experience of participants varied, with 37% having 1-5 years of experience, 27% less than one year, and 15% between 16-20 years. Only 9% of respondents reported having an educational qualification below a bachelor's degree, reflecting a generally high level of academic attainment. Notably, 36% hold

master's degrees, and 18% possess postgraduate qualifications, demonstrating a strong foundation for implementing inclusive teaching practices effectively.

#### **6.4 Key Findings on Social Inclusion and Physical Education**

A significant majority of teachers (83%) believe that Physical Education has a profoundly positive impact on the social lives of visually impaired students, underscoring its value as a tool for fostering social inclusion. While 76% of teachers view futsal as a practical activity for promoting inclusion, 14% expressed reservations, highlighting its potential while identifying areas for improvement in integrating futsal into programs for blind students.

#### **6.5 Employment Stability and Context**

More than half of the surveyed teachers (52%) hold permanent contracts, suggesting a degree of job stability among participants. However, the data shows a notable urban bias, with 82% of teachers working in urban schools. This could reflect disparities in resources and accessibility between urban and rural settings.

#### **6.6 Alignment with the UN Convention on the Rights of Persons with Disabilities (2006)**

The findings align with the principles of the UN Convention on the Rights of Persons with Disabilities, which asserts the right of individuals with disabilities to inclusive and quality education at all levels. The Convention emphasizes equal access to education, integration into mainstream environments, and eliminating segregation. It also highlights the necessity of accessible infrastructure, such as Braille materials and assistive technologies, to support inclusive practices.

The Convention encourages states to provide teachers with specialized training in inclusive methodologies and assistive technologies to address the diverse needs of students better. Furthermore, policies should promote diversity, respect, and non-discrimination through awareness campaigns and implementing flexible, individualized curricula.

#### **6.7 Limitations of the Study**

With only 66 participants, the sample size is relatively small, which limits the generalizability of the findings. A more extensive and diverse sample would yield more robust and reliable insights. Additionally, the study predominantly focuses on urban schools (82%), overlooking the unique challenges faced by rural and indigenous schools, which could provide important context for the findings. The survey format may have encouraged socially desirable responses, particularly regarding the perceived impact of Physical Education, as no negative responses were recorded.

#### **6.8 Recommendations for Future Research and Practice**

Future research should involve a larger, more geographically diverse sample that includes rural and indigenous schools to ensure that the findings represent a broader range of contexts. Given that 24% of respondents expressed reservations about futsal, further studies are needed to identify and address the barriers to its integration into inclusive Physical Education programs.

Moreover, the high percentage of teachers dissatisfied with the available resources (62%) underscores the need for improved adaptive equipment and specialized training to support visually impaired students better. Initiatives to engage younger teachers (20-25 years old) in inclusive Physical Education should be prioritized to ensure that all age groups are adequately prepared and supported.

Regular training and awareness campaigns can help teachers better understand the resources and tools available, particularly addressing the 24% of teachers who were undecided about resource availability. By addressing these limitations and implementing the suggested recommendations, the findings of this study can contribute to creating a more inclusive and effective educational system for students with disabilities, particularly those with visual impairments.

### **6.9 Impact of Physical Education on Social Inclusion and Equity**

This study highlighted how Physical Education activities contribute to social inclusion and equity, enhancing the physical, cognitive, and emotional well-being of students at risk of social exclusion. Physical activities are critical in developing students' bodily experiences and essential for fostering inclusion. The study concludes that the perceptions of Physical Education teachers regarding activities promoting learning equity and social inclusion, such as swimming, futsal, and Goalball, further scientific exploration. This reflects the importance of improving social inclusion and learning equity in Physical Education classes for blind students.

Physical Education holds a prestigious place among students, cultivating healthy habits that persist into adulthood. Satisfaction with psychological aspects such as competence, autonomy, relationships, and novelty is vital for students to have positive experiences and high participation rates in physical activities. Teachers can leverage adapted sports as tools for inclusion, ensuring effective educational responses.

Education plays a pivotal role in promoting awareness of disabilities and in fostering adapted sports that ensure participation, progress, and learning. The study concludes that Physical Education activities significantly contribute to equity and social inclusion for blind students in General Basic Education, providing equal opportunities and addressing the fundamental human need for social inclusion. It also emphasizes the educational benefits associated with physical activity, such as enhanced concentration, increased arousal levels, and, indirectly, improved academic performance.

### **6.10 Recommendations for Future Practice**

Moving forward, it is recommended to focus on engaging the 15% of female and 16% of male teachers who may not yet be fully involved in fostering social inclusion and learning equity in Physical Education. Ensuring that Physical Education consistently promotes learning equity and social inclusion for all students is essential. Schools should prioritize educating the remaining 16% of male and 15% of female Physical Education teachers to achieve this goal in General Basic Education. Such efforts are critical, as Physical Education provides all students with essential opportunities for security, inclusion, and belonging

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## Author Contributions

BHS: Supervision, project administration, obtaining funding, writing - revising the original draft. TP: Methodology, statistical analysis, conclusions, writing. GGC: Writing - Review and editing. and MC: Writing - Review and editing.

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## Competing Interests

The authors have declared that no competing interests exist.

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