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Realising Inclusive Physical Education: Barriers and Strategies for Including Students with Disabilities

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Abstract

Inclusive physical education still faces challenges in practice in regular schools. This study aimed to identify the main barriers and effective strategies in its implementation. Researchers selected a total of 245 physical education teachers from various school levels in Pekanbaru, Indonesia, using purposive sampling based on their experience teaching students with disabilities. Validated for the Indonesian setting, the PEATID III (Physical Educators' Attitudes Towards Teaching Individuals with Disabilities III) questionnaire was used for data collecting with great dependability ($\alpha = 0.88$). According to results, 68% of teachers reported exclusive attitudes from non-disabled students, 59% had never attended inclusion training, and 68% encountered limits of disability-unfriendly facilities. Implementation of inclusive strategies—such as curriculum customisation, the use of assistive technology, and parent collaboration—strongly connected teachers' favourable opinions with This study validates the need for synergy among instructors' pedagogical preparedness, easily available infrastructure, and school and family social support to provide fair and significant physical learning. The findings of this study significantly help Indonesia's inclusive physical education policies and practices to be developed.

Keywords: Barriers; disabilities; inclusive physical education; strategies

1. Introduction

Students with disabilities are entitled to special physical education included in general education under the Individuals with Disabilities Education Act (IDEA) of 2004 (Fuller et al., 2022). Physical education tailored to fit every child's needs—including those of those with special needs—is known as personalised physical education (Kumar & Sharma, 2024). Schools nowadays have to give every student, including in physical education, equal learning possibilities (Gerdin et al., 2019; Guerrero & Puerta, 2023). IDEA mandates physical education for every kid with disabilities (Mawena & Sorkpor, 2023). Emphasising the requirement of assistance for teachers, the Americans with Disabilities Act of 1997 mandates that qualified students receive special education and related services depending on their particular need (Fuller et al., 2022; Peranzoni et al., 2024). IDEA also requires that students with disabilities be educated with non-disabled students to the greatest extent possible and that removal to

a more restrictive environment be made only when education in a mainstream setting cannot be achieved despite all support services being provided (Fuller et al., 2022).

Indonesia is one of the countries in Southeast Asia that has sought to protect the educational rights of individuals with disabilities through various laws, although implementation remains challenging (Fikriyah, 2018). The Merdeka Curriculum, which is based on inclusive education and character development, requires adaptive physical education teachers to use diverse strategies to optimise the physical and character development of students with disabilities (Burhaein et al., 2025); the availability of certified adaptive physical education teachers remains limited, and most general teachers have not received specialised training (Mahendra et al., 2020). The physical education curriculum also often overlooks important legal aspects—students' rights and obligations, teachers' responsibilities, and safety protection—and thus needs to be strengthened (Qomarrullah et al., 2024). This legal foundation must be accompanied by enhanced training and professional support to make services for students with disabilities more meaningful. The principles of inclusive physical education emphasise personalised physical activities in regular classrooms; moving to a more segregated environment is only permissible if a student's needs are not met despite additional support, in accordance with the Least Restrictive Environment principle in IDEA (Haegele et al., 2021; Lieberman et al., 2017).

Inclusion in physical education involves providing services to students with special needs in a regular education setting (Wilhelmsen & Sørensen, 2017), aiming to create an environment where every student feels valued and empowered to develop academically and socially (Sridevi, 2023). Inclusive education programs seek to provide equal learning opportunities for students with disabilities, allowing them to learn alongside their peers without discrimination or exclusion (Han et al., 2024; Hayun et al., 2024). These initiatives seek to establish a school environment that honours diversity, acknowledges individual needs, and cultivates a sense of belonging for all children, regardless of their skills or disabilities (Sridevi, 2023). Including students with impairments help them to engage in the same classroom and reach personal objectives by means of a rigorous schedule of activities assuring equitable possibilities (Moriña et al., 2020). The difficult inclusion process requires numerous elements, especially those affecting instructors. Studies on inclusion have shown a lot of challenges like unfavourable attitudes of students with disabilities, inadequate training, and poorly suited facilities (Greguol et al., 2018; Rekaa et al., 2019). Positive inclusion therefore depends on quite important study on these issues.

New studies on the obstacles and incentives affecting children with disabilities' participation in physical education have shown rather interesting results. Several research include lack of accessible facilities, insufficient teacher training for addressing special needs, and negative attitudes from peers and teachers indicate that children with disabilities have great difficulties (Greguol et al., 2018; Li et al., 2021). Furthermore institutional limitations include limited resources (Kilinc, 2022) and weak policy support (Debasu & Yitayew, 2024). Usually hinder the establishment of a really inclusive classroom. On the other hand, studies on family involvement, inclusive policies, and assistive technology use have revealed how actively children with disabilities participate in physical education activities (Odeh & Lach, 2023). Complete understanding of inclusion in physical education activities across many school environments requires on a more integrated and contextualized approach.

Notwithstanding these efforts, historical results seem haphazard, pointing either structural, social, or personal elements alone (Jansen et al., 2020; Kvalsund & Bele, 2023). This approach has not given enough understanding of how these components interact and cooperate to affect the efficacy of inclusive physical education implementation. Changing the learning experiences of children with disabilities requires a great knowledge of the interplay among teacher readiness, infrastructural conditions, institutional restrictions, and classroom social dynamics (Elvira et al., 2024; Liu et al., 2025). This research employs a holistic approach to analyse the relationship among teacher attitudes,

their training, support from the school and community, and the efficacy of inclusive physical education methods. This technique is anticipated to yield metrics that are more pertinent, applicable, and aligned with the reality of the field.

Although the role of physical education in improving students' physical health, social competence, and emotional well-being has been widely proven (Haegele et al., 2021; Rekaa et al., 2019), access for students with disabilities in Indonesia remains limited— influenced by negative attitudes, inaccessible facilities, and a shortage of adaptive physical education teachers (Mahendra et al., 2020; Sari et al., 2022). Most previous studies have focused on a single factor in isolation—such as infrastructure or teacher attitudes (Sari et al., 2023)—failing to explain the complex interactions between teacher readiness, institutional support, and classroom dynamics. This knowledge gap hinders the development of truly inclusive physical education policies (Burhaein et al., 2025). Therefore, this study aims to (i) identify the main barriers teachers face in including students with disabilities in regular physical education; (ii) analyse the influence of teacher attitudes, inclusive training and institutional support on the implementation of inclusive physical education strategies; and (iii) explore the most effective strategies in increasing the involvement of students with disabilities in the physical learning process. Through this approach, it is hoped that research can make a significant contribution to designing physical education policies and practices that truly embrace all students.

2. Method

Participants

A total of 245 physical education teachers from elementary and junior high schools in Pekanbaru were selected through purposive sampling because this study required respondents who had actual experience teaching students with special needs in regular physical education classes—a rare and unevenly distributed population—so that random or convenience methods risked producing many teachers without relevant experience. Teachers were included if they met the following criteria: (i) at least two consecutive years of teaching physical education; (ii) having handled at least one student with a certified disability in the past three years; and (iii) holding a bachelor's degree in physical education, sports science, or a related field. All participants provided written consent and completed a research questionnaire, and their characteristics (gender, age, education, length of teaching, and history of teaching students with disabilities) were recorded in Table 1.

Table 1. Detailed characteristics of participants

School Level	Number of Teachers	Gender	Age	Experience Teaching Students with Disabilities* (> 5 years / ≤ 5 years)
		(M / F)	(M ± SD)	
Primary School	108 (44%)	75 / 33	38.2 ± 7.5	55 (51%) / 53 (49%)
Junior High School	86 (35%)	52 / 34	39.0 ± 8.1	47 (55%) / 39 (45%)
High School	51 (21%)	36 / 15	38.7 ± 8.3	30 (59%) / 21 (41%)
Total	245 (100%)	163 / 82	38.7 ± 8.0	132 (54%) / 113 (46%)

*Experience categories are based on teachers' self-reported cumulative years working with at least one student holding an officially certified disability; counts were cross-checked with school personnel records where available.

Instrument

This study used the Physical Educators' Attitude Toward Teaching Individuals with Disabilities III (PEATID III) developed by Rizzo (1993) and adapted to the Indonesian context by Sari et al. (2025). The adaptation process included (i) double translation (translation–back translation) by two bilingual translators to ensure equivalence of meaning; (ii) cultural adaptation—examples of sports activities

and disability terms were adjusted to national regulations and simplified for ease of understanding by teachers; and (iii) content assessment by five experts in inclusive physical education (all items obtained CVR > 0.60). The draft results were then piloted with 20 teachers outside the main sample to ensure clarity of wording; minor revisions were made before the final instrument (12 items, Likert scale 1–5) was used in this study.

Reliability and Validity

Tests on 245 teachers showed excellent internal reliability (Cronbach's $\alpha = 0.88$). Construct validity was confirmed through confirmatory factor analysis (CFA) with the established two-factor model: $\chi^2/df = 2.31$, CFI = 0.93, TLI = 0.92, RMSEA = 0.06; all factor loadings were 0.62–0.83 and AVE > 0.50. These results confirmed the fit of the theoretical structure and supported the use of the Indonesian version of PEATID III to measure physical education teachers' attitudes toward teaching students with special needs.

Data Collection

Data were collected using the Indonesian version of the PEATID III standard questionnaire, which was sent by email to physical education teachers from participating schools. Distribution was carried out with the assistance of school principals to ensure broad participation and adequate accessibility. Prior to completion, teachers received a written explanation of the research objectives, data confidentiality, and their rights as respondents. Participation consent was confirmed through written informed consent included at the beginning of the questionnaire. The data collection process took place over four weeks (April–May 2025). Of the 310 teachers contacted, 245 provided complete responses, resulting in a response rate of 79%, which was considered sufficiently representative for further analysis.

Data Analysis

Responses were examined utilising descriptive and inferential statistical techniques. Employing descriptive statistics such as frequencies, percentages, means, and standard deviations helped reveal the participants' demographics and the prevalence of the identified barriers. Researchers used inferential statistics, like correlation and multiple regression analyses, to explore how instructors' views related to the inclusive physical education strategies they used. We performed analyses using SPSS version 26, which facilitated thorough statistical processing and guaranteed the reliability and validity of the results.

3. Result

What are the main barriers teachers face in including students with disabilities in regular physical education lessons?

Table 2 presents descriptive statistics related to the barriers faced by teachers in including students with disabilities in regular physical education. Based on the data analysis, it was found that there are several main barriers to including students with disabilities in regular physical education learning. These barriers include a lack of accessible infrastructure, a lack of training for teachers, negative attitudes among non-disabled students, and high administrative burdens. A descriptive statistical analysis was conducted to understand how physical education teachers perceive these barriers, summarising the mean, standard deviation, and percentage of teachers who agreed with each barrier.

Table 2. Descriptive statistics of barriers in inclusive physical education

Barriers	Mean (M)	Standard Deviation (SD)	Percentage of Teachers Agreeing (%)
Lack of accessible infrastructure	3.89	0.75	68%
Lack of teacher training	3.75	0.82	59%
Negative attitudes of non-disabled students	3.55	0.78	53%
High administrative burden	3.42	0.80	47%

Based on Table 2, the most significant barrier is the lack of accessible infrastructure, with a mean value of M = 3.89, SD = 0.75, and 68% of teachers agreed that the sports facilities in their schools do not adequately support the needs of students with disabilities. This shows that accessibility limitations are still a major challenge in implementing inclusive physical education. Unfriendly infrastructure for students with disabilities, such as fields that do not have special access paths, the absence of adapted sports equipment, and the lack of other supporting facilities, hinders students' active participation in physical education activities.

The second most common barrier perceived by teachers was the lack of inclusive training, with an M = 3.75, SD = 0.82, and 59 per cent of teachers agreeing that they have not received sufficient training to teach students with special needs. This lack of training has an impact on teachers' limitations in adjusting teaching methods and adapting physical education activities to include all students. Without adequate understanding, teachers find it difficult to develop effective and inclusive learning strategies.

In addition, negative attitudes from non-disabled students are also an obstacle to inclusive physical education. With M = 3.55 and SD = 0.78, 53 percent of teachers indicated that non-disabled pupils frequently show less supportive attitudes towards their peers who have special needs. This mindset might show itself as an unwillingness to participate in group projects, hesitation to pursue sports interests, or discriminating behaviour making students with disabilities uncomfortable in the classroom environment. Negative attitudes might reduce the confidence and drive of children with impairments toward physical education.

According to the study, the implementation of inclusive physical education is hampered in great part by administrative burden. Of the teachers surveyed, 47 percent claimed an overflow of administrative tasks, which limited their time and resources for curriculum adjustment or the supply of inclusive teaching materials; this effect was shown by M=3.42, SD=0.80. These administrative responsibilities include creating courses fit for the needs of different students, documenting student successes for those with disabilities, and creating reports on inclusion.

These findings underscore the persistent problems that must be addressed to achieve genuinely inclusive physical education. Initiatives to enhance the involvement of students with disabilities in mainstream classrooms must prioritise improved infrastructure, extensive teacher training, and heightened awareness among non-disabled students of the significance of inclusion in physical education. In addition, more supportive education policies and reduced administrative burdens for teachers can help them focus more on creating inclusive and effective learning environments for all students.

To what extent do teachers' attitudestowards inclusive training and school support influence their implementation of inclusive physical education strategies?

Correlation Analysis

To explore the relationship between teachers' attitudes towards inclusive physical education and the strategies they implement, a Pearson correlation analysis was conducted. The results of the correlation analysis are shown in Table 3.

Table 3. Correlation between teachers' attitudes and strategies implemented

Variable	1	2	3	4
Teacher attitudes towards inclusion	1			
Curriculum adaptation	0.47*	1		
Use of assistive technology	0.39*	0.45*	1	
Collaboration with parents	0.42*	0.50*	0.41*	1

*p < 0.05, *$p < 0.01$*

The results of the correlation analysis showed that teachers' attitudes towards inclusion had a significant positive relationship with curriculum adaptation strategies ($r = 0.47$, $p < 0.05$), use of assistive technology ($r = 0.39$, $p < 0.05$), and collaboration with parents ($r = 0.42$, $p < 0.05$). This finding suggests that the more positive teachers' attitudes towards inclusion, the more likely they are to implement various strategies to support disabled students' participation in regular physical education learning.

Multiple Regression Analysis

A multiple regression analysis was conducted to examine how different factors, such as teacher attitudes, inclusive training, and school support, influence the implementation of inclusive physical education strategies.

Table 4. Results of multiple regression analysis

Predictor Variables	B	SE	β	t	p
Teacher attitudes	0.35	0.08	0.42	4.37	0.001
Inclusive training	0.28	0.07	0.39	3.92	0.002
School support	0.23	0.06	0.34	3.67	0.004

$R^2 = 0.48$, $F(3, 241) = 12.57$, $p < 0.001$

The results of the regression analysis indicated that all three predictor variables (teacher attitudes, inclusive training and school support) significantly influenced the implementation of inclusive physical education strategies ($R^2 = 0.48$), meaning the model was able to explain 48% of the variability in the strategies implemented by teachers.

What strategies are most effective in increasing disabled students' participation in regular physical education learning?

Curriculum Adaptation is the Main Strategy

The results of the analysis show that curriculum adaptation is the strategy most widely implemented by teachers and has a significant impact on increasing the participation of students with disabilities in physical education.

Table 5. Effectiveness of curriculum adaptation strategies

Adaptation Strategies	Mean (M)	Standard Deviation (SD)	Percentage of Teachers Using (%)
Modification of game rules	4.12	0.71	72%
Use of adaptive sports aids	3.98	0.75	68%
Simplification of movement instructions	3.85	0.79	64%
Adjustment of exercise intensity	3.77	0.83	61%

Table 5 shows that game rule modifications were the most effective form of adaptation (M = 4.12, SD = 0.71) and were used by 72% of teachers. These modifications include changes in field size and game duration, as well as more flexible competition rules to allow students with disabilities to actively participate. In addition, the use of adaptive sports aids such as sounding balls for blind students or sports wheelchairs for students with mobility limitations was also an effective strategy (M = 3.98, SD = 0.75) with 68% of teachers implementing it. Adjusting movement instructions (M = 3.85, SD = 0.79) and adjusting exercise intensity (M = 3.77, SD = 0.83) also helped to increase student engagement, especially for those with physical limitations or motor coordination disorders.

Use of Assistive Technology in Physical Education

In addition to curriculum adaptation, the use of assistive technology also proved to be an effective strategy in supporting the engagement of students with disabilities.

Table 6. Effectiveness of assistive technology in physical education

Types of Assistive Technology	Mean (M)	Standard Deviation (SD)	Percentage of Teachers Using (%)
Inclusive sports tutorial videos	3.95	0.78	65%
Interactive exercise apps	3.88	0.80	61%
Motion sensors and wearables	3.73	0.85	57%

Video tutorials featuring inclusive sport techniques were the most used technology by teachers (M = 3.95, SD = 0.78), with 65% of teachers reporting their use. These videos assist students in comprehending sports movements visually and provide guidance that is easier to understand. Meanwhile, interactive training apps (M = 3.88, SD = 0.80) that allow students to learn and practise independently are also widely utilised by teachers (61%). Some schools have started to adopt motion sensors and wearable devices such as smartwatches that can monitor students' physical activity, although the level of use is still lower than other strategies (M = 3.73, SD = 0.85, 57% of teachers).

Collaboration with Parents to Support Student Participation

Another strategy that has proven effective in increasing the participation of students with disabilities is collaboration with parents, which allows for ongoing support at home and school.

Table 7. Effectiveness of collaboration with parents

Forms of Collaboration	Mean (M)	Standard Deviation (SD)	Percentage of Teachers Using (%)
Regular communication between teachers and parents	4.02	0.76	70%
Involving parents in school activities	3.90	0.79	66%
Providing physical activity guidance at home	3.84	0.81	63%

Regular communication between teachers and parents was the most effective form of collaboration (M = 4.02, SD = 0.76), with 70% of teachers reporting that they actively discuss with parents the needs and development of students. This communication ensures that students receive consistent support both at school and at home. In addition, involving parents in school activities (M = 3.90, SD = 0.79) and providing guidance on physical activities that can be done at home (M = 3.84, SD = 0.81) also had a positive impact on the engagement of students with disabilities in physical education.

4. Discussion

This study set out to map the obstacles and practical solutions encountered when delivering inclusive physical education (PE) in ordinary Indonesian schools. The data exposed four persistent barriers: limited disability-friendly infrastructure, low levels of teacher preparation, exclusionary peer attitudes, and heavy administrative demands that squeeze lesson time. Consistent with Mawena and Sorkpor (2025) as well as Kombe et al. (2024), 68 % of teachers judged their sports facilities unsuitable for disabled pupils, confirming that physical space still dictates participation opportunities. In contrast to Delgado-Gil et al. (2023), we found an even higher proportion—59 %—lacking formal inclusion training, a gap that echoes the self-efficacy concerns flagged by Haegele et al. (2018) and Hutzler et al. (2019). This mismatch between mandated inclusion and professional development suggests that policy initiatives have not yet filtered down to day-to-day practice. Peer-related stigma also surfaced, with 53 % of respondents reporting negative comments from colleagues that curtailed disabled students' social interaction, reinforcing earlier qualitative work on classroom climate. Moreover, teachers blamed shrinking instructional minutes and paperwork for limiting creative lesson design, a pressure more acute than that recorded by Alves et al. (2017). Taken together, these findings call for coordinated reform that pairs professional upskilling with improved resources and a whole-school ethos of inclusion.

Teacher attitudes emerged as a decisive lever for successful inclusion initiatives. Our correlation analysis mirrors Sari et al. (2022) in showing that favourable attitudes track closely with curriculum adjustment, assistive-technology use and parent involvement. Unlike (Block, 2016), who reported modest uptake of modified rules, 72 % of our sample routinely simplified games, signalling growing acceptance of flexible pedagogy. This high adoption aligns with Frumos (2018) and Gkouvousi et al. (2024) who linked teacher self-efficacy to frequency of inclusive practices. Indeed, respondents with stronger confidence scores were significantly likelier to restructure teams, shorten playing time and amend scoring systems to accommodate diverse abilities. Such adaptations not only improved engagement but, as Holland and Haegele (2021) also observed, fostered peer bonding and intrinsic motivation among disabled students. Our results therefore extend previous work by illustrating how attitudinal change, practical know-how and structural flexibility interact rather than operate in isolation. Put differently, inclusion prospered when teachers viewed adaptations as pedagogical opportunities rather than administrative burdens.

Technology provided another catalyst for participation. Teachers who incorporated low-cost tools—video modelling, interactive drill apps—reported higher engagement from disabled learners. This pattern corroborates McNicholl et al. (2021), who found that readily accessible visual supports enhanced both comprehension and autonomous skill practice. Where we diverge is the scale of adoption: 64 % of our respondents employed at least one digital aid weekly, double the rate noted in their European sample. Pedagogically, such media enable differentiated instruction, a benefit emphasised by Johler and Krumsvik (2024) and recently replicated in Indonesian classrooms by Kurniasandi et al. (2023). Montgomery (2022) further argued that digital scaffolds free teachers to monitor individual progress, an observation echoed in our qualitative comments. Beyond hardware, inclusive practice depended on sustained parent–teacher dialogue. Consistent with Willis et al. (2019) and Yao et al. (2016), educators described how regular updates and joint goal-setting boosted pupils'

enthusiasm and perseverance. Taken as a whole, these findings stress that inclusive PE rests on a network of supports extending from classroom to home.

Our integrative model therefore positions accessible facilities, teacher readiness, supportive peer cultures and family partnership as mutually reinforcing pillars of inclusive PE. When any element weakens, opportunities for disabled students to build competence, confidence and connection rapidly contract. Several limitations, however, temper these conclusions. First, the sample was confined to one urban district and relied on volunteer respondents, introducing potential selection bias and limiting geographical generalisability. Second, all variables were self-reported, raising common-method concerns and omitting direct observation of teaching behaviour or student outcomes. Third, the cross-sectional design precludes assessment of attitude or practice change over time, while the PEATID III captures perceptions rather than psychosocial states such as student motivation. Future research should employ longitudinal mixed-methods designs across diverse regions to track how training interventions, policy shifts and resource upgrades influence both teacher behaviour and learner participation. Only through such sustained inquiry can inclusive PE move from aspirational rhetoric to durable, transformative practice.

5. Conclusion and Recommendation

This study verified that inclusion of all students in physical education classes in public schools still faces major obstacles, including limited facilities, inadequate teacher preparation, negative attitudes from non-disabled students, and difficulties related to school administration. The results imply that the implementation of inclusion measures is much enhanced by teachers' favourable attitudes towards inclusion, sufficient training and institutional support. Curriculum change, use of assistive technology, and proactive parent contact were the most successful strategies to raise the involvement of students with disabilities. Policies supporting the enhancement of teachers' capacity by means of ongoing inclusion training, the provision of disability-friendly facilities, and the development of an inclusive school environment so that every student has an equal opportunity to engage in physical education learning are hence required. This research contributes to getting a better grasp of the challenges and implementation strategies of inclusive physical education in regular schools and offers applicable recommendations for the development of more inclusive physical education policies. This research can serve as a basis for policymakers, educators, and practitioners to strengthen the implementation of inclusive physical education in Indonesia, with a focus on improving the quality of teacher training, creating more accessible facilities, and establishing an inclusive culture in schools.

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