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Improving Kinesthetic Intelligence and Physical Freshness through Rhythmic Gymnastics in PJOK Learning for Students with Special Needs (Deaf) at SLB Muhammadiyah Kelayu

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Abstract: This study aims to improve the kinesthetic intelligence and physical fitness of students with hearing impairments through rhythmic gymnastics lessons in Physical Education, Sports, and Health (PJOK) at SLB Muhammadiyah Kelayu, East Lombok Regency. The research employed a collaborative classroom action research (CAR) approach involving both the researcher and the PJOK teacher. The action was conducted in two cycles, each comprising planning, implementation, observation, and reflection stages. The research subjects consisted of eight students with hearing impairments, including four females and four males. Data were collected through documentation, observation, and performance assessments using developed kinesthetic intelligence and physical fitness instruments, and then analyzed descriptively using quantitative methods. The results indicate that after the rhythmic gymnastics intervention, kinesthetic intelligence improved, with 75% of students reaching the expected development level by the end of Cycle II. Physical fitness also showed significant improvement across five main components: endurance increased to 68.7%, muscle strength and endurance to 65.6%, agility to 68.7%, flexibility to 65.6%, and balance to 71.8%. Rhythmic gymnastics proved to be an effective approach to support inclusivity while enhancing the kinesthetic intelligence and physical fitness of students with hearing impairments.

Keywords: Classroom Action Research; Physical Education; Physical Fitness; Rhythmic Gymnastics; Hearing Impaired Students.

1. Introduction

Education has a strategic role in improving the quality of human resources. Efforts to improve the quality of national education are based on regulations that serve as guidelines in the implementation of educational functions and responsibilities (Fajriani et al., 2024). Education is not only understood as a process of knowledge transfer, but also as a process of structuring life experiences so that individuals have the direction and meaning of life (Wasitohadi, 2014). Holistically, education aims to develop the affective, cognitive, and psychomotor realms, one of which is through Physical Education.

The right to education is a fundamental right of every citizen as stipulated in the 1945 Law of the Republic of Indonesia. This provision emphasizes that every individual, including children with special needs (ABK), has the same right to develop their potential through quality education without discrimination. However, reality shows that access to special education, such as Special Schools (SLB), is still uneven, especially in remote areas. Data shows that of the 1,544,184 children with special needs in Indonesia, only a small percentage have received formal education services, while the rest are still unreached by the education system (Ujma et al., 2025). This condition reflects a significant gap in access to education for ABK, especially deaf students (Mardiansah et al., 2024).

Deaf children experience hearing loss which has an impact on verbal communication barriers, thus also affecting the development of language, physical, and kinesthetic abilities. The negative perception of the public towards disability often causes deaf children to be less involved in physical activity. Limited verbal communication and lack of structured physical activity contribute to the low development of motor skills and body expressions of deaf

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children (Citra et al., 2022). In fact, physical activity plays an important role in improving fitness, body coordination, and motor skills that support daily life activities.

Hearing loss also has a multidimensional impact on children's development, including cognitive, motor, and social aspects (Diepeveen et al., 2018). Children's cognitive development is greatly influenced by social interaction and environmental exploration (Piaget, 1952). In deaf children, communication limitations have the potential to inhibit participation in physical activity that is essential for the development of coordination, balance, and kinesthetic intelligence. Therefore, effective guidance and social interaction are important factors in the learning process, in line with the concept of proximal developmental zones put forward by Vygotsky (1978).

Deafness is classified based on the degree of hearing loss measured in decibels (dB), ranging from mild to severe deafness. Each category has characteristics that affect communication and learning skills. Deaf learners tend to have lower levels of kinesthetic intelligence compared to children with normal hearing (Odabaşi, 2023). This shows the need for a learning approach that emphasizes physical activity and visual stimulation to optimize kinesthetic development.

Kinesthetic intelligence is an individual's ability to effectively process the body to express ideas, emotions, and physical skills (Michelaki & Bournelli, 2023). The development of this intelligence in deaf children can be done through structured physical activities, such as rhythmic gymnastics. Kinesthetic-based Physical Education not only improves fitness and motor skills, but also contributes to the formation of students' character (Rodji et al., 2022).

Physical freshness is a basic need that is directly related to the quality of human life. In deaf children, the development of physical freshness requires an approach tailored to their communication needs and physical characteristics (Putri & Purnomo, 2023). A planned, routine, and visual-based physical exercise program has been proven to improve fitness and reduce anxiety levels of deaf children (Fitriatun & Irmansyah, 2023).

Physical Education is an integral part of the curriculum and must be provided at all levels of education, including in SLB. Although the learning materials refer to the regular curriculum, their application needs to be modified according to the needs of students with special needs (Qonita et al., 2024). Visual instruction, movement demonstration, and the use of gestures are important factors in the success of physical learning for deaf children.

Facts in the field show that deaf students at SLB Muhammadiyah Kelayu experience difficulties in participating in rhythmic gymnastics activities due to limited understanding of verbal instructions, low motivation, and lack of variety in learning methods. Positive reinforcement through praise and reward can increase students' participation in physical learning (Skinner, 1953).

Rhythmic gymnastics is a physical activity that is carried out systematically and continuously to the rhythm of music, which aims to improve fitness, coordination, and kinesthetic intelligence. Research shows that rhythmic gymnastics has a significant effect on improving students' physical fitness and motor skills (Yamin, 2024). This is in line with Gardner's theory of multiple intelligences which places kinesthetic intelligence as one of the intelligences that can be developed through structured physical activity.

The results of observations at SLB Muhammadiyah Kelayu show that the kinesthetic intelligence and physical freshness of deaf students are still low due to lack of training intensity, limited facilities, and fluctuations in the emotional state of students. In fact, previous research has proven that rhythmic gymnastics is effective in increasing students' kinesthetic intelligence and physical freshness (Pratiwi & Maulida, 2021).

Based on these problems, this research is important to improve kinesthetic intelligence and physical freshness through the application of rhythmic gymnastics in learning Physical Education, Sports, and Health (PJOK) for deaf students at SLB Muhammadiyah Kelayu.

2. Literature Review

2.1 The Essence of Physical Education

Physical Education is part of the educational process that utilizes physical activity as a means to develop physical fitness, motor skills, knowledge, attitudes, and social values of students (Harahap, 2024). Physical education activities are arranged based on movement, exercise, and health maintenance efforts that are tailored to the needs and characteristics of students (Al Fathan et al., 2022). Through fun physical activities, students are directed to have an awareness of the importance of physical fitness and factors that affect physical health, so that a healthy and active lifestyle is formed in a sustainable manner.

The application of *the Achievement Goal Theory* and *Self-Determination Theory approaches* allows teachers to create a learning environment that supports the psychological needs of

learners, so that the intrinsic motivation to move and practice can develop without external pressure (Fernández et al., 2022). This condition provides space for the strengthening of motor control that is directly related to the development of kinesthetic intelligence. Physical education has also been shown to contribute to the improvement of physical freshness, which is the basis for the implementation of efficient, coordinated, and responsive movements.

Based on Law Number 3 of 2005 concerning the National Sports System, physical education is seen as a planned and continuous educational process to develop knowledge, personality, skills, health, and fitness through physical activities and sports. For deaf children, physical education has an important role, including in physical and motor development, the use of visual communication such as sign language and demonstration, increasing socialization, strengthening confidence, and adjusting materials to remain inclusive. In addition, the use of learning video media can increase students' motivation and understanding of the material presented (Sakdiah et al., 2022).

2.2 Children with Special Needs

Children with Special Needs (ABK) are individuals who experience developmental differences compared to children in general, both in physical, mental, and social aspects. These conditions can be influenced by prenatal, perinatal, and postnatal factors (Sunarti & Mardianti, 2024). Children with special needs show significant deviations in physical, intellectual, social, emotional, or mental aspects so that they need special educational services (Mardiansah et al., 2024).

Children with *special health needs* include individuals who have physical, developmental, sensory, cognitive, emotional, and behavioral disorders that limit function and require special services and programs (Andreeva, 2020). Without appropriate interventions, such as intensive care and integrated services, the development of children with special needs cannot take place optimally (Lestari, 2022).

The level of special needs can vary from mild to severe, in the form of single or double abnormalities. The terms *disability*, *impairment*, and *handicap* are used to describe these conditions, with different meanings as explained by the World Health Organization (WHO). *Disability* refers to limited activities due to *impairment*, *impairment* indicates disturbances in the structure or function of the body, while *disability* describes the social barriers experienced by individuals due to these conditions.

Based on Law of the Republic of Indonesia Number 2 of 1989 concerning the National Education System, students with physical and mental disorders are classified as exceptional children who require special educational services. These needs can come from innate conditions or external factors such as economic, social, emotional, and behavioral pressures.

2.3 Tunarungu

Deaf children are individuals who experience hearing impairment or loss of function, both temporary and permanent, so that they have difficulty receiving auditory information. This condition not only impacts the ability to hear and understand speech, but also affects psychosocial aspects and academic achievement (Jong et al., 2024). Physically, deaf children generally do not have any visible special characteristics, but their learning activities are influenced by the degree of hearing loss, cognitive ability, and environmental support.

Despite experiencing verbal communication barriers, deaf children often have good visual communication skills, such as the use of sign language (Horn et al., 2005). Therefore, learning for deaf children requires methods and media that emphasize visual and kinesthetic aspects. In addition, disorders of the vestibular system can cause delayed motor development, unstable balance, and suboptimal coordination of movements.

In physical education learning, this condition requires teachers to modify learning strategies through visual demonstrations, sign language, and adjustments to the type of physical activity. An inclusive and adaptive approach is needed so that learning goals are not only achieved in motor and cognitive aspects, but also support the social and emotional development of deaf children as a whole.

2.4 Underlying Learning Theories of Research

Learning theory serves as a foundation for understanding the process of students in acquiring knowledge, skills, and attitudes. This research focuses on improving kinesthetic intelligence and physical freshness through rhythmic gymnastics in PJOK learning for deaf students. Therefore, the theories used include constructivism theory as *a grand theory*, motor learning theory, and multiple intelligence theory that emphasizes the role of physical activity and social interaction in the learning process.

2.5 Kinesthetic Intelligence

Intelligence is defined as the ability of individuals to understand information, think quickly, and respond appropriately to various situations. Etymologically, the term *intelligence* comes from the Latin *word intelligentia* which means the ability to connect and organize various elements.

Children with hearing loss are known to have equivalent nonverbal cognitive abilities, even superior in some respects to children without hearing loss, especially on visual-based tasks. This shows that hearing impairment does not directly hinder intellectual potential when supported by appropriate learning strategies (Umesh et al., 2025).

2.6 The Essence of Physical Freshness

Physical freshness is an important component that supports an individual's ability to carry out various life activities optimally. A good level of physical fitness is needed not only by athletes to support sports achievements, but also by workers and students, including children with special needs who are deaf, to be able to do activities and learn effectively without experiencing excessive fatigue. Physical freshness reflects the efficiency of the work of body systems, such as the circulatory system, respiration, and muscle and joint function, so that individuals have adequate endurance and energy reserves in completing daily physical activities.

Physical freshness indicates a person's physical readiness to face the demands of daily activities effectively. This aspect not only includes strength and endurance, but also involves elements of agility, balance, and speed as part of overall physical fitness (Fitriana & Darmawan, 2023).

In the context of physical education, physical freshness plays a role as the basis for students' readiness to participate in learning actively and optimally. Physical education not only focuses on developing motor skills, but also functions in character building, instilling discipline, and habituating a healthy lifestyle. Students with a good level of physical freshness tend to be more responsive, active, and able to participate optimally in learning activities. In addition, physical freshness contributes to disease prevention and improved quality of life, especially among urban adolescents (Santoso & Nurhayati, 2025). Thus, physical freshness is not only seen as a physical condition, but as part of a lifestyle that supports individual performance academically, socially, and functionally.

2.7 Rhythmic Gymnastics

Rhythmic gymnastics is a form of physical fitness activity that combines gestures with musical accompaniment or rhythmic beats. This activity emphasizes coordination of movement, flexibility, precision, and body expression that is in harmony with the rhythm. Rhythmic gymnastics is carried out systematically and continuously with the aim of developing motor skills, the beauty of movement, and improving the physical and mental health of participants (Nurfajri, 2025).

Warmer (1994) explained that gymnastics is a body exercise that is done on the floor to develop endurance, strength, flexibility, agility, coordination, and the ability to control body movements. Rhythmic gymnastics is specifically defined as a series of movements that are carried out following the rhythm of music or a certain tempo so as to produce harmonious and aesthetic movements. In line with this, Tri (2010) stated that rhythmic gymnastics or rhythmic gymnastics is a structured movement exercise that is carried out with or without assistive devices, with an emphasis on rhythmic harmony and precision of movement.

3. Materials and Method

The data analysis in this study uses quantitative descriptive and qualitative descriptive approaches. Quantitative descriptive analysis was used to describe and measure the increase in kinesthetic intelligence and physical freshness of deaf students through rhythmic gymnastics activities based on observation and evaluation results in each cycle. Quantitative data in the form of rhythmic gymnastics test scores, including aspects of strength, endurance, agility, and movement coordination, were analyzed using Simple Descriptive by calculating the average score and percentage of indicator achievement, then presented in the form of tables and diagrams to facilitate interpretation and show comparison of results in pre-cycle, cycle I, and cycle II (Nasir & Sukmawati, 2023). The success of the action is determined based on the percentage of achievement of kinesthetic intelligence and physical freshness of the learners.

Meanwhile, qualitative data were analyzed based on observation, reflection, and documentation records using narrative-descriptive techniques by compiling a description of the research findings (Hartina et al., 2024). Data processing is carried out by categorizing data according to the development of deaf students and applying time triangulation to increase the

validity of data through comparing data at different times, so that consistency, behavioral changes, and patterns of motor and kinesthetic development as well as physical freshness of students can be identified. The analysis process is carried out through the stages of data reduction, data presentation, and conclusion drawing and verification, in accordance with the qualitative data analysis procedure proposed by Sugiyono (2018).

4. Results and Discussion

4.1 Results of Kinesthetic Intelligence Research

This class action research (PTK) was carried out for one month, namely from November 1-30, 2024 at SLB Muhammadiyah Kelayu, with the aim of improving the kinesthetic intelligence and physical freshness of deaf students through rhythmic gymnastics activities. The research was carried out in two cycles, each consisting of planning, implementation, observation, and reflection stages.

In the pre-cycle stage, rhythmic gymnastics learning is carried out once in a meeting to find out the initial condition of students' kinesthetic intelligence. The activity began with a simple warm-up, followed by rhythmic gymnastics using basic movements and the accompaniment of slow music. Observations were carried out using instruments that included indicators of eye, hand, and foot coordination, balance, strength, agility, flexibility, and gesture skills. The observation results showed that most of the students were still in the Undeveloped (BB) and Starting to Develop (MB) categories, with an average kinesthetic intelligence achievement of 26.7%. This condition shows the low kinesthetic ability of students which is influenced by the lack of variety of learning methods and low learning motivation.

Based on the results of the pre-cycle reflection, the action is continued to Cycle I. At this stage, learning is designed using demonstration methods, video media, and visual cues that are tailored to the characteristics of deaf students. The implementation of the first cycle was carried out in two meetings. The results of the observation showed an increase in kinesthetic intelligence, with the average achievement increasing to 38.5%. Some students are starting to be able to follow a series of gymnastic movements, although they still experience obstacles in coordination of complex movements and consistency in following the rhythm. Based on the classification of results, most of the participants were still in the BB and MB categories, while only a small percentage reached the Developing As Expected (BSH) category.

Reflection in Cycle I shows that learning has gone quite well, but it is not optimal. Some of the obstacles found include decreased motivation at the end of the activity, limited mastery of certain movements, and less supportive environmental conditions. According to the theory of the learning environment, the physical conditions of the environment affect the effectiveness of learning (Slameto, 2010). Therefore, improvements are needed in the next cycle, especially in the variety of methods, intensity of exercise, and motivation strategies.

In Cycle II, learning planning is enhanced by choosing more appropriate music, using clearer visual cues, gradual repetition of movements, and providing rewards to increase student motivation. The implementation of Cycle II was also carried out in two meetings. The results of the observation showed a significant increase, where all students reached the minimum category of Developing According to Expectations (BSH), with an average achievement of kinesthetic intelligence of 75.5%. In fact, some students have reached the Very Good Development (BSB) category.

Based on the comparison of the results from pre-cycle to Cycle II, it can be concluded that the gradual and continuous application of rhythmic gymnastics activities has proven to be effective in increasing the kinesthetic intelligence of deaf students. Consistent learning strategies, the use of visual media, and approaches that are in accordance with the characteristics of students have a positive impact on the development of their motor and kinesthetic abilities.

4.2 Results of Physical Freshness Research

Physical freshness was measured through pre-cycle, Cycle I, and Cycle II stages with indicators of heart and lung endurance, muscle strength and endurance, agility, flexibility, and balance. In the pre-cycle stage, the results of observations showed that most indicators of physical freshness were still in the low category, with an average achievement of below 30%. This condition shows that students have a level of physical fitness that is not optimal and requires further coaching.

In Cycle I, rhythmic gymnastics learning is carried out in a structured manner with an emphasis on the continuity of movement and rhythm. The results of the observation showed an increase in all indicators of physical freshness, especially in heart-lung endurance, muscle strength, and flexibility. However, some students still experience fatigue and decreased motivation in the middle of the activity, so the results obtained have not been maximized.

Improvements were made in Cycle II by adjusting the intensity of movements, clarifying demonstrations, and providing motivation and rewards. The results of observations in Cycle II showed a significant increase in all components of physical freshness, with an average achievement of above 65%. The balance and agility indicators showed the highest improvement, while muscle strength and endurance continued to improve despite the need for further strengthening.

Overall, the results of the study show that PJOK learning through rhythmic gymnastics activities is not only effective in improving kinesthetic intelligence, but also makes a positive contribution to improving the physical freshness of deaf students. These findings confirm the importance of integrating structured and sustainable physical activity into the physical education learning process.

4.3 Discussion

The application of rhythmic gymnastics in PJOK learning has been proven to be able to increase the kinesthetic intelligence of deaf students. Rhythmic movement-based physical activity allows learners to learn through hands-on experience by coordinating body movements regularly to the tempo of the music. These findings are in line with the theory of multiple intelligences put forward by Gardner (1983), which states that kinesthetic intelligence is related to an individual's ability to use the body to express ideas and feelings. The results of this study also strengthen the findings of Citra et al. (2022) and Michelaki and Bournelli (2023) who concluded that rhythmic movement activities play a role in improving motor coordination and body expression of children with special needs. In the context of deaf students, rhythmic gymnastics serves as an effective nonverbal communication medium, as learners can understand instructions through visual observation of the instructor's movements without relying on verbal communication.

The increase in kinesthetic intelligence is inseparable from the role of the teacher as a facilitator who creates an active, fun, and interactive learning atmosphere. This is in line with the opinion of Meylinda (2022) who states that active, exploratory, and reflective learning is able to build meaningful knowledge. Thus, rhythmic gymnastics not only functions as a physical activity, but also as a learning medium that supports the motor, social, and emotional development of deaf students.

In addition to having an impact on kinesthetic intelligence, the application of rhythmic gymnastics also showed a significant increase in the physical freshness of deaf students. The average score of physical freshness increased from 61.2% to 84.2% after two cycles of action, with all students achieving the minimum completeness criteria. The improvement is seen in the aspects of endurance, muscle strength, agility, and body balance. These findings are in line with the research of Putri and Purnomo (2023) and Fitriatun and Irmansyah (2023) who stated that physical exercise carried out regularly and in a structured manner can improve the physical fitness of deaf children. Rhythmic gymnastics activities with repetitive movement patterns and stable musical rhythms also contribute to increasing heart-lung capacity and body flexibility (Yamin, 2024).

The increase in the physical freshness of students is also influenced by the application of positive reinforcement during the learning process. Praise and appreciation for students' efforts encourage motivation and self-confidence, as stated in the theory of operant conditioning by Skinner (1953). This strategy is considered effective in the learning of deaf children who require emotional support to increase active participation and involvement in learning activities.

During the implementation of the action, there was a significant change in behavior and student participation. Students who were previously passive and easy to give up began to show activeness, courage, and enthusiasm in participating in PJOK learning. This shows that physical activity not only has an impact on the physical aspect, but also on the psychological and social development of students. These findings are in line with Vygotsky's (1978) theory of proximal developmental zones, which emphasized the importance of support from more experienced individuals. In this study, teachers play the role of facilitators through visual guidance, while peers become social models in the process of learning to imitate movements.

5. Conclusion

Based on the implementation of class action research which includes the pre-cycle, cycle I, and cycle II stages, several main conclusions were obtained as follows. Learning rhythmic gymnastics has been proven to be effective in increasing the kinesthetic intelligence of deaf children. This is shown by the development of students' ability to control body movements, adjust movements to rhythm, and display better coordination and flexibility. The findings show that rhythmic gymnastics can be used as a learning strategy that is able to stimulate the basic motor skills of deaf children so that their kinesthetic development can be achieved according to the expected indicators. In addition, learning rhythmic gymnastics makes a positive contribution to improving the physical freshness of deaf children. The components of physical freshness, such as endurance, muscle strength and endurance, agility, flexibility, and balance, are consistently improved with each cycle. Rhythmic and structured rhythmic gymnastics activities that involve multisensory coordination have been proven to improve cardiovascular function, muscle strength, and overall motor ability. Thus, PJOK learning through rhythmic gymnastics can be seen as an effective, adaptive, and inclusive pedagogical approach in improving the physical quality of deaf children while overcoming their motor limitations.

Academically, the results of this research contribute to the development of the concept of adaptive learning in physical education for students with special needs. This study confirms that rhythm and movement-based learning approaches are effective in developing kinesthetic intelligence and physical freshness simultaneously. Practically, this research can be a reference for PJOK teachers in designing interesting, visual, and communicative learning for deaf children. Learning rhythmic gymnastics has been proven to be able to increase active participation, learning motivation, and physical and emotional abilities of students. Therefore, the results of this research can be used as a reference in the development of physical education programs in Special Schools (SLB) to be more inclusive and in accordance with the needs of students.

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