



The Effectiveness of the Drill Method in Teaching Pianika to Children with Cerebral Palsy at SLB Rumah Pintar Salatiga

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Abstract

This study aims to evaluate the effectiveness of pianica music learning using the drill method in improving fine motor skills among children with cerebral palsy (CP) at the Rumah Pintar Special Needs School in Salatiga. The research employed a qualitative case study approach involving five students with varying degrees of CP severity. Data were collected through in-depth interviews, observation, and documentation to assess the impact of repetitive and structured practice using the pianica as a learning medium. The findings revealed significant improvements in fine motor skills, particularly in hand-eye coordination, finger strength, and rhythm pattern comprehension. Initially, students struggled with simple rhythmic patterns, but after 12 sessions, their success rate increased to 80% with more complex rhythms. The drill method also had a positive impact on students' motivation and confidence. Previously passive students became more enthusiastic and willing to take on new challenges. The study also found that the degree of CP severity affected the learning outcomes, highlighting the need for individualized teaching approaches. In conclusion, the drill method using the pianica is effective in enhancing fine motor abilities and supporting the psychological development of children with CP. This approach can serve as a relevant strategy for special education and is worth adopting more broadly.

Keywords: Fine Motor Skills, Cerebral Palsy, Drill Method, Pianica, Special Education.

Introduction

Cerebral palsy (CP) is a non-progressive neurological disorder that affects the development of movement and body posture due to brain damage occurring during early developmental stages. One of the most affected aspects is fine motor skills, which involve the use of small muscles such as those in the fingers and hands, essential for activities like writing, drawing, or holding objects with precision (Dunn & Leitschuh, 2000). Children with cerebral palsy (CP), particularly those with the spastic type, generally experience difficulties in performing such activities due to limited muscle control, movement stiffness, and poor hand-eye coordination.

At SLB Rumah Pintar Salatiga, fine motor impairments among students with cerebral palsy present a significant challenge in the learning process. Based on initial observations, most students demonstrate difficulty in holding writing tools steadily, playing simple musical instruments, or engaging in handicraft activities. These difficulties directly impact students' self-confidence, independence, and academic achievement. Therefore, the development of structured learning strategies aimed at stimulating and training fine motor functions is urgently needed (Muliadi et al., 2024; Saputri, 2021).

One approach that has begun to gain attention in special education is music-based

learning. Music is recognized as a multisensory medium that stimulates not only cognitive and emotional aspects but also physical aspects, particularly motor coordination. The use of the melodica, which combines elements of breathing and rhythmic key pressing, is believed to encourage repeated, focused, and enjoyable small muscle activities in the hands and fingers. Moreover, musical activities can enhance concentration, strengthen motor memory, and foster students' enthusiasm for learning (Angermeier et al., 2009; Hurlock, 1978).

Previous research conducted at SLB YPAC Makassar showed that a structured melodica learning program was able to improve fine motor skills in children with cerebral palsy by up to 15 percent after 12 training sessions (Muliadi et al., 2024). This finding reinforces the potential of using music as an intervention medium in the education of students with special needs, particularly those with motor impairments. However, the learning strategies implemented in practice remain varied and lack standardization. This is where the drill method becomes important as a systematic, structured, and repetitive approach to strengthen skills through consistent practice.

The drill method is a teaching technique that focuses on repetitive practice with the aim of strengthening mastery of specific movements or responses. In the context of children with cerebral palsy, this method is relevant because it can help reduce muscle stiffness, train movement consistency, and improve coordination patterns. In addition, programmed repetition through musical instrument learning provides sensorimotor stimulation that directly contributes to strengthening the connection between the brain and the child's muscular system (Sudjana, 1995).

The theory of sensory and motor stimulation underlying this approach states that rhythmic physical activity, especially those involving multi-sensory coordination, can form more stable synaptic pathways in the brains of children with neurological impairments. This provides a strong

theoretical foundation for designing learning models that focus not only on cognitive outcomes but also on students' physiological development. Therefore, melodica learning through the drill method serves not only as a medium for artistic expression but also as a potential fine motor therapy tool within inclusive education.

This study aims to examine the effectiveness of the drill method in melodica instruction for improving fine motor skills in students with cerebral palsy at SLB Rumah Pintar Salatiga. The research focuses on three main aspects: (1) hand-eye coordination, (2) finger strength and flexibility, and (3) the ability to follow rhythmic patterns. By evaluating the changes that occur during the learning process, this study is expected to make a meaningful contribution to the development of more adaptive, engaging, and individually responsive special education strategies.

Method

This study employs a qualitative approach with a case study design to explore in depth the impact of melodica instruction using the drill method on improving fine motor skills in children with cerebral palsy (CP) at SLB Rumah Pintar Salatiga. This approach was chosen because it allows for a comprehensive understanding of the students' individual contexts and the natural learning processes they experience (Yin, 2014). The case study design is considered relevant due to its focus on a limited but in-depth unit of analysis, taking into account the diversity of experiences and responses of subjects toward the intervention.

The population of this study includes all students with CP at SLB Rumah Pintar Salatiga. The sample was selected purposively based on several criteria, including: (1) a confirmed diagnosis of CP, (2) age between 6 and 12 years, (3) experiencing fine motor difficulties, and (4) active participation in melodica learning at school. Based on these criteria, five students with varying levels of CP severity (from mild to moderate) were selected. Purposive

sampling was employed to ensure a diverse range of conditions that would allow a comprehensive evaluation of the effectiveness of the drill method (Creswell, 2014).

Data were collected using three main techniques: observation, semi-structured interviews, and documentation. Observations were conducted in a participatory manner in the classroom, where the researcher directly recorded students' behaviors and abilities during learning sessions. The observation instrument consisted of a checklist covering indicators of fine motor skills such as finger strength, hand-eye coordination, and accuracy in playing melodica keys (Sudjana, 1995). Interviews were conducted with classroom teachers and therapists as key informants to gather information about student progress, challenges during learning, and their perceptions of the drill method. Documentation included teacher journals, photos, and videos collected regularly during each learning session to reinforce the observational and interview data. Triangulation across these three sources was applied to enhance data validity (Creswell, 2014).

The instruments used were validated through expert judgment by two special education experts. Content validity was ensured by verifying that each indicator accurately reflected fine motor skills aligned with the research objectives. Instrument reliability was tested through a pilot study involving two students with similar characteristics at another school. The results indicated sufficient data consistency in observing the targeted behaviors (Sugiyono, 2016).

This study was conducted over the course of one month and involved three phases: preparation, implementation, and analysis. The preparation phase included coordination with the school, socialization with teachers and parents, and the development of research instruments. The implementation phase consisted of 12 melodica learning sessions, each lasting 45 minutes. Sessions were held three times a

week and focused on repeated tone pattern exercises using the drill method. Observations were conducted during every session, while interviews took place after the sixth and twelfth sessions. Visual documentation was consistently collected to track behavioral and skill changes over time (Spradley, 1980).

Data analysis was conducted using thematic analysis techniques. The process began with transcribing observational and interview data, followed by open coding to identify emerging themes. Relevant themes were then categorized and interpreted based on the theory of sensory and motor stimulation and previous research findings (Sugiyono, 2016). NVivo software was used to support the organization and classification of the data. The main focus of the analysis was to uncover patterns in fine motor development and the relationship between the application of the drill method and students' overall skill improvement.

This approach has several limitations, including a small sample size and the specific school context, which limits the generalizability of the findings. Nevertheless, the results of this study offer meaningful contributions as a foundational reference for developing music-based learning strategies for children with special needs, particularly in strengthening fine motor skills.

Result and Discussion

This study aims to evaluate the effectiveness of melodica instruction using the drill method in improving fine motor skills in children with cerebral palsy (CP) at SLB Rumah Pintar Salatiga. Through a qualitative case study approach, data were collected using observation, interviews, and visual documentation, and then analyzed thematically. The following section presents the findings and discussion based on five main focus areas: hand-eye coordination, fine muscle strength, the ability to follow rhythm, student motivation, and the

relationship between the severity level of CP and developmental outcomes.

Improvement in Hand-Eye Coordination

Hand-eye coordination is a fundamental aspect of fine motor skills. At the beginning of the learning process, most students experienced difficulty in pressing the melodica keys accurately. They frequently hit the wrong keys, showed hesitation, and struggled to stay focused while following the sequence of notes provided by the teacher. However, as the 12 drill-based learning sessions progressed, a significant improvement was observed. Table 1 below illustrates the changes in students' hand-eye coordination scores from the initial session to the final session:

Table 1. Improvement of Hand-Eye Coordination in Students with Cerebral Palsy Over 12 Melodica Learning Sessions

No	Inisial Siswa	Tingkat CP	Skor Awal (Sesi 1)	Skor Tengah (Sesi 6)	Skor Akhir (Sesi 12)	Persentase Peningkatan
1	A	Ringan	2	4	7	250%
2	B	Sedang	3	5	7	133%
3	C	Sedang	2	4	6	200%
4	D	Berat	1	3	4	300%
5	E	Ringan	2	5	8	300%

This progress is further supported by the visualized graph below, which clearly illustrates the initial and final scores of each student.



Figure 1. Improvement in Fine Motor Scores Based on the Severity Level of Cerebral Palsy

In general, these results are consistent with the findings of Setiyati (Setiyati, 2018), who stated that the drill method using physical aids can improve visual-motor coordination in children with special needs. Additionally, a study by Dunn & Leitschuh (2000) supports the idea that structured sensorimotor-based activities can stimulate neural connections related to fine motor skills.

Strengthening of Fine Muscles in Fingers and Hands

In addition to coordination, fine muscle strength, particularly in the fingers and wrists, also showed significant improvement. Students who initially were only able to press melodica keys for a few minutes were, by the final sessions, able to complete 45-minute exercises without noticeable fatigue. Teachers and therapists reported that finger pressure became more stable and stronger, as reflected in the more consistent and rhythmic sound of the melodica.

This condition has direct implications for daily activities such as gripping writing tools, opening food containers, and buttoning clothes. This improvement reinforces the notion that music-based learning serves not only as an artistic medium but also as a potential form of motor therapy.

Ability to Follow Rhythmic Patterns

Rhythm is a fundamental element of music learning. In this context, the drill method has proven effective in enhancing students' ability to understand and follow rhythmic patterns, both simple and complex. These results are presented in the following table:

Table 2. Success Rate of Students with Cerebral Palsy in Following Simple and Complex Rhythmic Patterns

No	Inisial Siswa	Pola Ritme Sederhana (%)	Pola Ritme Kompleks (%)	Peningkatan Total (%)
1	A	40%	80%	+40%
2	B	35%	75%	+40%

3	C	30%	70%	+40%
4	D	20%	50%	+30%
5	E	45%	85%	+40%

This improvement is also visually represented in the following graph.



Figure 2. Comparison of Success in Following Simple and Complex Rhythmic Patterns

Consistent with Dunn & Leitschuh (2000), regularity in rhythmic practice strengthens motor memory and movement consistency. This finding also supports the study by Dandashi et al. (2015), which stated that the entertainment aspect of music enhances the retention of learning patterns in children with developmental disorders.

Changes in Student Motivation and Behavior

The most significant transformation observed was not only physical but also psychosocial. Students' learning motivation increased dramatically. In the initial sessions, some students appeared passive and would only participate when prompted by the teacher. However, by the final sessions, students actively requested turns to practice and even expressed pride when successfully completing specific note patterns.

Motivational data were assessed based on three aspects: interest, engagement, and self-confidence, as illustrated in the following graph.

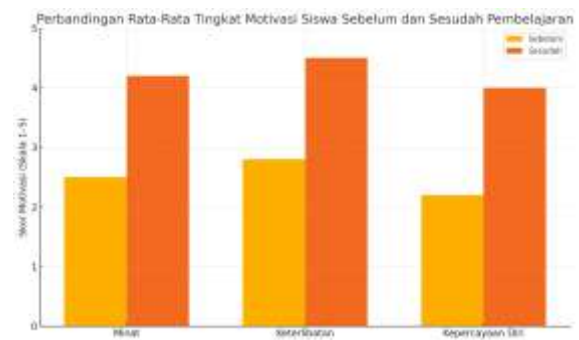


Figure 3. Comparison of Average Student Motivation Levels Before and After Learning

This finding is consistent with the motivation theory proposed by Hurlock (1978) and Angermeier et al. (2009), which states that small successes in learning can serve as powerful motivators for further exploration and achievement.

Variation in Development Based on CP Severity

The severity level of cerebral palsy has a clear impact on the pace and extent of development. Students with mild CP showed faster and more stable improvements, while those with more severe CP required more time and repetition. Nevertheless, all participants demonstrated significant progress in accordance with their individual capacities.

The following table outlines this relationship:

Table 3. Relationship between the Severity Level of Cerebral Palsy and Improvement in Fine Motor Skills

No	Inisial Siswa	Tingkat Keparahan CP	Skor Awal Motorik Halus	Skor Akhir Motorik Halus	Selisi h Skor	Keterangan Perkembangan
1	A	Ringan	2	7	+5	Sangat signifikan
2	B	Sedang	3	7	+4	Signifikan
3	C	Sedang	2	6	+4	Signifikan
4	D	Berat	1	4	+3	Cukup signifikan
5	E	Ringan	2	8	+6	Sangat signifikan

These findings emphasize the necessity of adopting an individualized and responsive instructional approach that aligns with each student's capacity. There is no universally applicable method; however, when adjustments are made to the frequency, intensity, and instructional strategy, the drill method can still be effective for all levels of cerebral palsy.

Pianica-based learning through the drill method has shown a comprehensive positive impact on the development of fine motor skills, rhythmic ability, and student motivation among children with cerebral palsy. These results strengthen the position of music as a therapeutic learning medium in special education settings. Although the outcomes vary according to the severity of cerebral palsy, this strategy remains adaptable to individual needs. Future developments may include the integration of interactive technologies such as digital pianicas and the extension of intervention periods to evaluate long-term effects.

Conclusion

This study demonstrates that learning to play the pianica using the drill method has a significant positive impact on improving

the fine motor skills of children with cerebral palsy at SLB Rumah Pintar Salatiga. Improvements were evident in hand-eye coordination, finger muscle strength, and the ability to follow rhythmic patterns. Beyond motor aspects, the method also fostered the development of motivation, self-confidence, and active student participation in the learning process.

The effectiveness of this approach is reinforced by the consistency of results obtained through multiple data collection methods, as well as the active involvement of teachers and therapists who observed tangible changes in students' behavior and physical abilities. Although outcomes varied depending on the severity of cerebral palsy, all participants showed measurable progress within their respective capacities, emphasizing the importance of adaptive and individualized instructional strategies.

This study offers a meaningful contribution to the field of special education, particularly in applying music as both a functional and therapeutic learning medium. The findings underscore that an approach based on repetitive practice and sensorimotor stimulation can serve as a foundation for developing educational interventions that are not only instructive but also rehabilitative.

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