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The Effect of Audio-Visual Media on The Front Roll Floor Exercise Skills of Phase B Students with Disabilities in Adaptive PE Learning

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Abstract

This study aims to examine the effect of audio-visual media on improving the forward roll floor exercise skills of Phase B deaf students in adaptive physical education. Students with hearing impairments face challenges in receiving verbal instructions, which often hinders their understanding of motor skills, especially in complex movements such as the forward roll. This quasi-experimental research used a one-group pretest-posttest design involving 10 students from a special education school. The intervention was conducted over 12 sessions using instructional videos accompanied by visual cues and progressive movement stages. Data were collected using an observation sheet and analyzed using descriptive and inferential statistics. The results showed a significant improvement in students' motor performance after the implementation of audio-visual media. The integration of visual-based instruction helped students to better observe, imitate, and internalize movement techniques. This study confirms that audio-visual media is an effective strategy for supporting the learning needs of students with disabilities, especially those with sensory impairments. Moreover, it contributes to the development of inclusive and adaptive physical education practices by encouraging the use of technology to enhance instructional delivery and student engagement.

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INTRODUCTION

Physical education is an integral part of the education system which aims to develop the physical, mental, social and emotional aspects of students as a whole (Bailey et al., 2021). In practice, physical education is not only intended for regular students, but is also an important tool in inclusive education, especially for students with special needs (Tallec-Marston et al., 2020). One real form of inclusive practice is adaptive physical education, namely physical learning that is modified according to the characteristics and needs of students with physical, intellectual, or sensory disabilities (Block & Obrusnikova, 2022). Among the various forms of activities, floor gymnastics—especially the forward roll technique—is one of the basic movements that is widely applied because it functions to improve motor coordination, self-confidence, and students› courage in exploring physical (Goodway et al., 2019).

However, the implementation of floor gymnastics learning for deaf students in special schools still faces serious challenges. One of the main obstacles is the limitation in verbal communication which causes difficulty in understanding teacher instructions (Stinson & Antia, 2016). This often causes students to fail to understand the stages of movement techniques that must be mastered. In addition, there are still many teachers who rely on lecture methods or direct demonstrations without being supported by visual media that are appropriate to the learning style of deaf students (Kumar & Singh, 2020). As a result, the learning process is less effective and the achievement of students› psychomotor skills is not optimal, especially in technical movements such as forward rolls.

The development of educational technology presents new opportunities in responding to these challenges, one of which is through the use of audio-visual media. This type of media allows the delivery of material simultaneously through visual and auditory channels, and has proven effective in improving conceptual understanding and motor skills (Mayer, 2020). For deaf students who rely heavily on visual stimuli, video learning media provides access to more concrete, systematic, and repeatable information according to individual needs (An & Lee, 2018). In addition, graphic and animated displays in video media are able to simplify complex information into visuals that are easy for students with communication disabilities to understand.

Several previous studies have shown that audio-visual media has a positive impact on learning motor skills. Research by (Ibnu & Sunarti, 2016)And (Lestari et al., 2023)proves that learning videos can improve floor gymnastics learning outcomes in regular students. However, this kind of research is still limited to the general student population and has not targeted many students with special needs, especially deaf students. In fact, their learning needs are very different, especially because of obstacles in auditory perception which cause their own challenges in understanding movement technique instructions (Marschark et al., 2017). Therefore, research that focuses on the effectiveness of audio-visual media for deaf students in special schools is very relevant and urgent to be carried out.

This research is presented as a response to the research gap. The novelty lies in the context of the subject raised, namely deaf students phase B in Special Schools, and the focus on complex motor skills in the form of forward rolls in floor gymnastics. In addition, the learning approach used is adjusted to the characteristics of deaf students, through the integration of visual cues, repetition of video displays, and the arrangement of training stages in stages (Sutherland & Pegg, 2018). The integration of learning videos and interactive demonstration strategies makes this research not only practically relevant, but also offers theoretical contributions in the development of adaptive physical education models based on digital media.

The forward roll movement itself is a series of movements that require body control, balance, coordination, and courage. For deaf students, the biggest challenge lies in understanding the sequence of movements conveyed verbally by the teacher. With visual media, students can directly observe the stages of movement and imitate them independently without depending on verbal communication (Bodsworth & Goodyear, 2021). This reinforces the concept that good learning media must be able to adapt to the sensory preferences of learners, especially those with hearing impairments.

Pedagogically, the use of audio-visual media is a form of innovation in adaptive physical education that supports the principle of inclusivity. Teachers are no longer the only source of information, but rather act as facilitators who accompany the process of exploring student movement. Thus, students are not only passive

recipients of information, but also active actors in building understanding and skills through direct experience and repeated observation (Morley et al., 2022). This sensory-based learning experience is very effective in improving the learning outcomes of students with special needs.

This study also contributes to the academic literature in the field of physical education, especially related to media-based adaptive learning. The results of this study are expected to be a basis for teachers, schools, and policy makers in designing learning strategies that are evidence-based teaching and in accordance with the principles of inclusive education (UNESCO, 2021). With empirical evidence on the effectiveness of audio-visual media for deaf students, a similar approach can be developed for other motor skills in Special School.

The main objective of this study was to test the extent to which audio-visual media can improve the forward roll floor gymnastics skills of deaf students phase B. This study used an experimental approach with a one group pretest-posttest design, and involved Special School students as research subjects. It is expected that the results of this study will provide representative and applicable data for the development of responsive learning to the needs of students with sensory disabilities.

Thus, this study not only provides empirical evidence on the effectiveness of audio-visual media, but also offers a new paradigm in adaptive physical education. Visual media-based learning strategies are expected to bridge the gap between conventional methods and the learning needs of deaf students. Ultimately, these findings support the realization of more inclusive, effective, and meaningful physical education in the context of special schools and the wider education system.

METHOD

This study uses a quantitative approach with a quasi-experimental method and a one-group pretest-posttest design to test the effect of audio-visual media on forward roll floor gymnastics skills in deaf students. This design involves measurements before and after treatment in the same group.

The subjects of the study were 10 deaf students at Special School PGRI Pasirjambu, who were selected using purposive sampling technique based on inclusion criteria: able to read, write, and have a minimum attendance of 4 days per week. Students with multiple disabilities or reading and writing disabilities were excluded from the sample.

Treatment was given for 12 meetings, using a video of learning the forward roll technique according to the stages (beginning, roll, continuation, ending). The media was displayed through an infocus and accompanied by visual cues from the teacher. The approach used was interactive teaching, with the section and progressive method, and the command style teaching style.

The research instrument was a floor gymnastics skill observation sheet containing four stages of movement. Each stage was scored 0–4, with a maximum total score of 16. Data were collected through direct observation on the pretest and posttest by the researcher and two accompanying teachers.

Data were analyzed descriptively and inferentially. Normality test using Kolmogorov–Smirnov, homogeneity test using Levene's test, and hypothesis test using paired sample t-test. Significance criteria were set at $p < 0.05$, then the data were tested with SPSS 25 (Fadluloh et al., 2024).

Learning success is determined based on individual completion (value $\geq$ 70) and classical completion ($\geq$ 80% of students achieve the value). The ability category is divided into five: very competent, competent, quite competent, less competent, and incompetent.

RESULTS AND DISCUSSION

It can be seen that the average value in the pre-test is 9.70 with a standard deviation of 1.059 while the test value in the post-test is 14.10 with a standard deviation of 1.287 and the difference between the average value and standard deviation in the pre-test and post-test is the difference in the average value of 4.4 while the standard deviation is 0.228. So it can be concluded from the explanation above that there is a difference between the pre-test and post-test.

From the data taken, if the significant value is > 0.05, then the data is normally distributed, and vice versa if the significant value is < 0.05, then the data is not normally distributed. Based on the output above, the significant value is 0.127 > 0.05, then the data tested is distributed "Normally".

Based on the value produced through the submission of homogeneity of the variables using Levene's Test, it shows a figure of 0.124 at sig. greater than 0.05 (significance>0.05), which means that the data obtained from the test is in a

homogeneous state, namely that all populations have the same variance.

Based on the Calculation using SPSS 21, from the data taken then if the significant value <0.05 then there is a significant difference, and vice versa if the significant value> 0.05 then there is no significant difference. Based on the results of the t-test there is a significance value of 0.000 if the Sig value <0.05 then it can be concluded that "There is an effect of the use of audio-visual media on forward roll skills".

The results of this study show that the use of audio-visual media significantly influences the improvement of forward roll floor gymnastics skills in deaf students. This strengthens the view that students with hearing impairments need a learning approach that prioritizes visual channels, due to their limitations in responding to verbal instructions from teachers. Audio-visual media is present as a concrete solution in bridging this communication barrier, because it presents information in visual form that can be observed, understood, and imitated independently by students.

Learning floor gymnastics, especially the forward roll technique, requires an understanding of the sequence of movements and proper body coordination. Video media allows students to observe the stages of movement from the beginning to the end repeatedly, so that the learning process becomes more meaningful. In other words, audio-visual media not only functions as a visual aid, but also as a source of independent learning that strengthens students' absorption of the material. This is in line with the opinion (Smaldino et al., 2019), that visual media is effective in strengthening students' ability to grasp and understand learning content, especially in the psychomotor domain.

During the learning process, teachers are no longer the only center of information. Video media plays an important role as a movement model that can be followed by students with a visual learning style. The use of video also allows for consistency in delivering material, because all students receive the same information without depending on the teacher's ability to demonstrate movements directly. As stated by (Akbar, 2020), digital media can overcome limitations in conventional learning, especially when dealing with the diversity of student needs in inclusive classes.

Moreover, the use of audio visual media has been proven to increase students' learning motivation. The display of moving images, colors, and sounds in the video can create a pleasant learning atmosphere, and encourage students to be active in trying the movements taught. This strengthens the opinion (Djamarah, 2002), that interesting learning media can reduce learning boredom and help students focus. This psychological effect is very important for deaf students, because they need positive emotional support in the often challenging learning process.

From a pedagogical perspective, the integration of audio-visual media into floor gymnastics learning is a form of implementing an adaptive learning approach. Teachers not only deliver materials, but also design visual strategies that are appropriate to the characteristics and abilities of students. Strategies such as video repetition, visual cues, and gradual learning have helped students understand each part of the movement more easily. This is in accordance with the concept of differentiated instruction which emphasizes the importance of adjusting teaching methods to suit individual learning needs (Tomlinson, 2017).

This finding is also supported by research (Ibnu & Sunarti, 2016), which shows that video-based floor gymnastics learning can significantly improve student learning outcomes. In the context of students with special needs, visual media even becomes the main support for successful learning because it is able to convey messages that cannot be captured through auditory channels. According to (Amrianus, 2018), also emphasized that visual media is able to create stimuli that strengthen students' attention and retention in the motor learning process.

The novelty of this study lies in its focus on deaf students in developmental phase B, which has not been widely explored in the context of adaptive physical education learning. While most similar studies have been conducted on regular students or on basic motor skills, this study directs attention to complex skills such as forward rolls, with a technology-based approach. This provides a novel contribution to the development of evidence-based inclusive learning strategies in the field of physical education.

This study also confirms that learning physical skills does not only depend on direct practice in the field, but can also be mediated by educational technology. By utilizing video media, deaf students can observe, imitate, and strengthen movements without having to wait for verbal instructions from the teacher. This supports the blended physical education approach as ex-

plained by (Bailey et al., 2021), which combines the advantages of physical interaction with the effectiveness of digital media.

Theoretically, the results of this study strengthen the view that the effectiveness of learning is greatly influenced by the suitability between media and student characteristics. In the context of adaptive physical education, media selection is a crucial aspect that can determine the success or failure of the learning process. Therefore, teachers need to consider the use of audio-visual media as the main strategy, not just an aid, in designing learning for students with special needs.

Thus, these findings not only provide empirical evidence of the effectiveness of audio-visual media, but also encourage a paradigm shift in adaptive physical education. Teachers are encouraged to be more creative, inclusive, and responsive to students' learning needs, and to utilize technology as a tool to optimize the potential of each individual, especially those with communication barriers.

CONCLUSION

The results of this study indicate that the use of audio-visual media significantly influences the improvement of forward roll floor gymnastics skills in deaf students in the context of adaptive physical education learning. This media is able to bridge the limitations of verbal communication through the presentation of clear and repetitive visual movements, thus facilitating students' understanding and implementation of techniques. This finding confirms that audio-visual media can be an effective and inclusive learning strategy for students with special needs. Therefore, the integration of visual-based media in the adaptive physical education learning process needs to be encouraged as part of pedagogical innovation that is responsive to the needs of students with sensory disabilities.

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