International Journal of
Disabilities Sports and Health Sciences
e-ISSN: 2645-9094

RESEARCH ARTICLE

Sitting Volleyball Learning Model: A Study On Disabled Student Aged 10– 12 Years In Indonesıan Context

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Abstract
This study aims to produce a volleyball learning model for disabled students aged 10-12 years by developing a model that is easily adapted to the physical form. This research is a type of development research used the Borg and Gall model. The subjects of this study are disabled students aged 10 – 12 of 7 specific or exclusive elementary schools grades 4, 5, and 6. Developing or validating model products in the field for physically disabled students is the product of this study. Evaluation by experts using two physical education experts and one learning expert, furthermore we conducted small-scale trials involving questionnaires, consultations, and evaluations. The development results show that the sitting volleyball game learning model is suitable for use and the t test results show that Sig 0,001 < 0.05. These results show that the volleyball model training method is effective in improving the physical fitness of disabled students when compared to conventional training. The conclusion obtained in this research is that the sitting volleyball for disabled students aged 10-12 years is a model that is easily adapted to the physical movement form of students with special needs.

Keywords
Disabled Student; Game; Learning Model; Sitting Volleyball

INTRODUCTION

Education is the most important investment for a nation, especially for a developing nation (Arsyadiantiny et al., 2023). In Indonesia as a developing nation, the principle of equal education has been put into practice, particularly concerning students with special needs. This commitment to equality in the education system for students with special needs is enshrined in the inclusive education framework. Education plays a vital role in the life of a nation, serving as a cornerstone for its development and overall sustainability. The progress of a nation will be closely related to efforts to advance the nation's education. To advance a nation's education, it will be done through various channels.

Apart from improving the quality of school extracurricular education, the government will also take the extracurricular school education route. The fields of extracurricular activities themselves can take the form of artistic activities, sports, and personality development (Ardiansyah et al., 2020; D'isanto, 2020). Education is the main means for a child to prepare for his future, the main basis for socializing (Aulia Lita Pradina et al., 2023). Besides that, education must be understood as part of the process of cultivating student subjects so that it is not only the transfer and mastery of knowledge as well as training and mastery of certain technical skills, but also needs to be understood as the growth and development of student subjects into cultured and civilized human persons (Sousa et al., 2020; Syaparuddin & Elihami, 2020). So, education is very important, one of which is physical education (Silva et al., 2022; Cereda, 2023).

Physical education has several aspects that

Received: 03 October 2023 ; **Revised** ; 07 December 2023 ; **Accepted:** 08 December 2023; **Published:** 25 February 2024

How to cite this article: Yono, T., Humaid, H., and Samsudin, S. (2024). Sitting Volleyball Learning Model: A Study On Disabled Student Aged 10– 12 Years In Indonesıan Context. *Int J Disabil Sports Health Sci*;7(Special Issue 1):158-164. https://doi.org/10.33438/ijdshs.1370780

already exist in students that can be developed optimally in overall education (Culajara, 2023). To help students carry out daily activities and understand why humans move and can carry out movements safely, effectively and efficiently, it is necessary to present learning experiences (Balkis-Ozdelice et al., 2021; Mustafa & Dwiyogo, 2020; Pradana, 2020). Physical disabilities, often referred to as individuals with physical impairments, result from conditions such as congenital neuromuscular and skeletal disorders, illnesses, accidents (resulting in the loss of body organs), polio, and paralysis. These conditions lead to difficulties in mobility and physical functioning. Physically disabled students who experience abnormalities in the cerebral system, their academic characteristics are disturbed so that they experience difficulty in receiving lessons and their academic achievement is low (Ghaznavi et al., 2021; Jariono et al., 2022).

Previous research related to learning models in physical education for students with special needs has been widely carried out. The integration of Augmented Reality (AR) in physical education learning simplifies the comprehension of teaching materials for both teachers and disabled students, rendering the educational experience more engaging (Widyaningsih et al., 2023).Previous research regarding the development of a volleyball learning model for school students can show that the learning model used is effective in increasing student interest (Megawati et al., 2023).The volleyball learning model centered around gameplay proves to be more effective in enhancing the fundamental volleyball skills of junior high school students (Samsudin et al., 2023). Previous research found that the learning model was effectively applied to basketball learning for children with disabilities (Pressé et al., 2011).

The conclusive outcomes of the creation of a volleyball instructional model for disabled student s aged 10-12 years, which were produced through field test revisions. disabled is classified into three levels, including: 1). Mild physical disabled, included in this classification, is pure physical disabled and mild combination of physical disabled. This type of quadriplegic generally only experiences slight mental disorders and their intelligence tends to be normal. This group is mostly caused by abnormalities in body parts only.Such as paralysis, reduced limbs (stuns) and other physical disabilities.2). Moderate physical disabled, included in this classification, is physical disabled due to congenital defects, mild cerebral palsy and mild polio. This group often experiences tuna due to cerebral palsy (tunamental) which is accompanied by decreased memory, although not far below normal. 3). Severe physical disabled included in this classification is disabled due to severe cerebral palsy and disabled due to infection (Alsa et al., 2021; Patel et al., 2020; Su et al., 2023).

Based on these studies, it is not clear what the volleyball game model is for people with disabilities. Apart from that, based on the results of observations, it shows that teachers have not found a model for learning the game of boli ball that is suitable for students with disabilities aged 10-12 years. Therefore, this research aims to develop a sitting volleyball learning model for students with disabilities aged 10-12 years.

MATERIALS AND METHODS

Research Design

Participants and Process

Physically disabled students aged 10-12 years who will be the subjects of this research are 7 special schools grades 4, 5, and 6 with a total sample of 35 students. This study produced a volleyball learning model for disabled students aged 10-12 years by developing a model that is easily adapted to the physical shape of students with special needs. The athlete involved in the study received detailed information regarding the study protocol, their rights, and the potential risks associated with participation. This information was conveyed before obtaining written informed consent. All procedures undertaken in this study received approval from the ethics committee at Lembaga Penelitian dan Pengabdian Masyarakat Universitas Negeri Jember (Approval No 29/II.3.AU/LPPM/2023).

Table 1. Demographic characteristics of the participants

Characteristics	M	SD
Age	10,94	0,90
Height	144,6	4,34
Weight	35,26	2,70
BMI	21,38	1,86
Gender (Male)	35%	
Gender (Female)	65%	

Mean:M; Standard Deviation:SD

The present study falls under the category of developmental research. This study used 10 steps in research and development:

1. Research collecting preliminary, begin by conducting initial research and collecting information, which may involve on-site observations and a review of relevant literature.
2. Reaserch planning. Plotting a model for the sport of sitting volleyball.
3. Early product development. Create a model of a sitting volleyball game
4. Expert validation. Analyze expert assessments conducted by two physical education experts and one learning expert, along with small-group trials involving questionnaires, consultations, and evaluations.
5. Product revision. Revision based on the results of expert judgment.
6. Early test. Model revision based on the results of expert evaluation and small group trials.
7. Product revision. This revision is used to improve the initial model created by the researcher.
8. Field Test. Large group trial using a recently revised model.
9. Final product revision. Refinement of the ultimate model in accordance with the findings from field experiments.
10. Desiminatoion. Spreading the learning model to schools with special needs.

The following 10 stages of the development method will be explained in the following image.

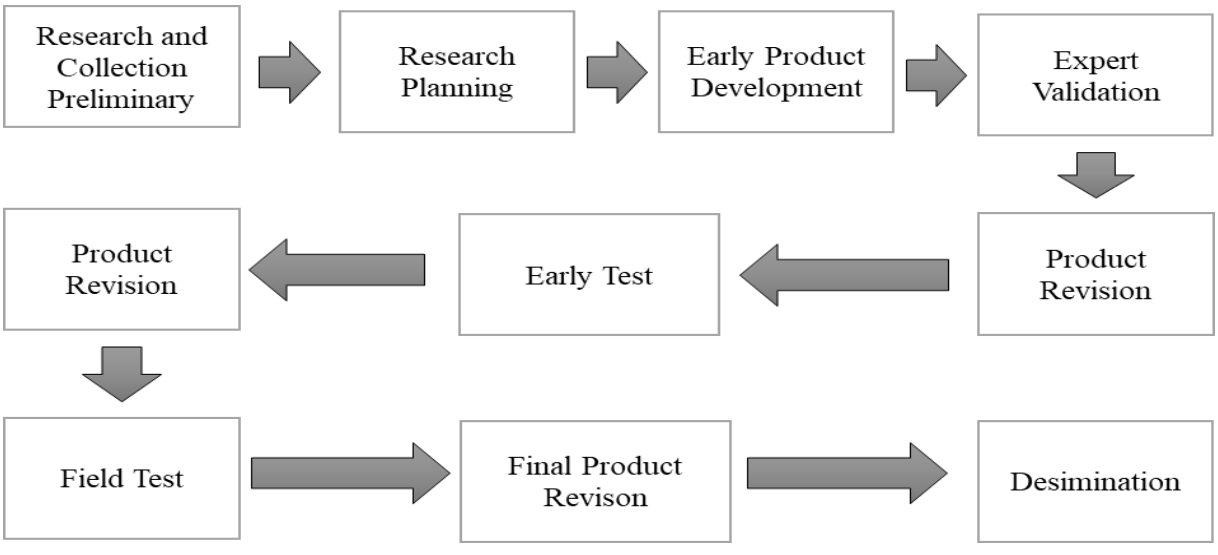

Figure 1. Method borg and gall

Table 2. Classification of result

Percentage	Classification	Information
80-100%	Very Good	Can be utilized without the need for any modifications
61-80%	Good	Can be employed with slight adjustments
41-60%	Enough	Not appropriate for utilization; it is advisable to refrain fromusing it
21-40%	Not Good Enough	Cannot be used
00-20%	Not Good	Cannot be used

Data Analysis

The data retrieval method for needs analysis relies on a combination of interviews, observations, and questionnaires. Interviews were carried out to collect information, observations involved careful monitoring of the ongoing training process, and questionnaires were distributed among physically disabled students. The data obtained was then continued with analysis using SPSS namely the t-test.

RESULTS

Below the results of interviews, observations and questionnaires will be presented

Table 3. Results of interviews, observations and questionnaires

Method	Data Conclusion
Interview	In an interview with the teachers, it was mentioned that there is a deficiency in having a guidebook for student volleyball learning models. It is challenging to locate precise instructional materials for volleyball learning tailored to physically disabled students It takes a model of learning volleybal for Physically disabled students
Observation	It was discovered that the exercises were solely based on intuition, with no predefined plan or specific trainingobjectives in mind at that moment.
Questionnaire	The distribution of questionnaires among physically disabled students yielded a response rate of 72.96%. Based on the questionnaire distribution, it can be inferred that there is a consensus among the students regarding the development of volleyball learning models

Table 3 shows the results of interviews with teachers, results of observations in the field, and results of questionnaires that among students with physical disabilities produced a response rate of 72.96%, which shows that there is a context among students regarding the development of a volleyball learning model. Next, the results will be described based on the development process carried out. The models of development for volleyball in the context of research and development are specifically customized to cater to the needs of physically disabled students. These exercise models are meticulously designed to assist in improving the physical capabilities of these students.

Results based on the stages of the development process showed that at the initial stage, namely preliminary research and collection, students with disabilities experienced difficulties in learning volleyball, even the learning model used was not appropriate. Then the second stage is research planning, namely using the problems experienced to create a sitting volleyball learning model flow. The third stage is designing in detail the learning model that will be developed. After the development product in the form of a learning model is ready, the fifth stage of expert validation is carried out. This research uses material experts and media experts. Based on the results of expert validation, it was found that the learning model was valid and therefore suitable for implementation. However, there were slight revisions to add more detailed descriptions regarding the 6 game models, so the researchers carried out the product revision stage according to expert advice. Next, in the early test stage, which was carried out on 10 students, it was found that the learning model was suitable for use with slight revisions, namely clarifying the pictures of the 6 game models. Therefore, the researcher carried out product revision as the 7th stage of development. After the product was revised, the 8th stage of large group trials was carried out, namely using 25 students to find that the learning model was suitable for use. The 9th stage, namely the final product revision, corrected a few sentences with typos and added images that had no description. Based on these revisions, the product is improved and complete and the 10th stage can be carried out, namely dissemination, namely spreading the learning model to schools with special needs.

This section also provides an explanation of the effectiveness testing of the models, which involves the active participation of physically disabled students. The objective of this testing is to assess the efficiency of the training regimen that has been developed. The data collected regarding the effectiveness of this test is quantitative in nature, necessitating the use of an experimental design. The chosen design for this effectiveness test is the randomized control group pretest-posttest design. The selection of this design is considered advantageous because it is a purely experimental approach where groups are randomly assigned to either the volleyball training group or the conventional training group.

In this testing phase, the approach differs

from the earlier small and large-scale trials as it relies on quantitative data to compare the pretest-posttest results between the groups. This method is considered objective in evaluating the model's effectiveness. The quantitative data results, as **Table 4.** T-test statistic

Variable	Group	Statistics	T-Test	P Value	Status
Model Volleyball	Ability	42.3112	3.491	0.00	Different
Conventional	Physical	34.3591			

Table 4 shows that the Sig value obtained is 0.00 < 0.05, that there was a difference between the pretest and posttest, so this shows that the volleyball model training method is effective in improving the physical fitness of disabled students when compared to conventional training. The outcomes highlight the significance of the volleyball training model in stimulating physically disabled students.

DISCUSSION

With a comprehensive focus on the development of physical exercise models, the seated volleyball model has been executed successfully. Based on these findings, it can be confidently asserted that this exercise model is highly effective in enhancing the physical well-being of physically disabled students. The results of this research show that the learning model volleyball is valid to use and based on the t test there is a significant effect using this development model. This aligns with Scholish's assertion that volleyball training methods are designed to improve overall physical condition, as well as physical fitness and cardiovascular health (Kusnandang, 2019; Silva et al., 2022; Sousa et al., 2020). In accordance with Wastcott Wayne's theory, volleyball training represents a structured workout regimen consisting of a sequence of diverse exercises executed in a continuous fashion within a single session of volleyball practice (Umidovich, 2023). Therefore, the development model implemented in this research is effective because it consists of a comprehensive program that combines various physical components for disabled students.

Physical education learning models for children with special needs are very important. The learning model must adapt to the conditions previously mentioned, will manifest as variations in the values within each training group. As a result, it becomes imperative to conduct a statistical test, specifically the t-test, to determine which learning model for volleyballas follows:

of students with special needs (Widyaningsih et al., 2023). In line with the results of this research, researchers created a learning model in the form of a volleyball game by adapting to the conditions of students with special needs. The sport education model, which assigns active roles to students with special needs based on their talents and interests within the team, has successfully increased their active engagement in class, motivation, and socialization (Oğuzhan & Hunuk, 2018).

Learning models in Physical Education are an important part of achieving successful learning goals at every level of education. The Physical Education learning model consists of various models that can be applied by teachers (Arifin et al., 2021). The results of this research indicate that the volleyball game learning model can be applied by teachers in learning for students with disabilities aged 10-12 years so that they can achieve success in learning.

This learning model is probably effective because the game indicators used adapt to the conditions of students with disabilities. The learning model for students with disabilities must be adapted to the student's condition and the learning objectives (Oğuzhan & Hunuk, 2018). The sitting volleyball game model designed for students with disabilities aged 10-12 years is a versatile approach easily tailored to accommodate the physical movements of students with special needs. So that teachers can apply the game model in learning for students with special needs.

Conflict of Interest

The authors declare no conflict of interest. No financial support was received.

Ethics Statement

Lembaga Penelitian dan Pengabdian Masyarakat Universitas Negeri Jember Ethics Committee approved the study protocol (Onay No 29/II.3.AU/LPPM/2023), (11-9-2023).

Author Contributions

Study Design,Topo Yono; Data Collection, Topo Yono and Hidayat Humaid; Statistical Analysis, Topo Yopo and Samsudin; Data Interpretation, Topo Yopo and Samsudin; Manuscript Preparation, Topo Yopo, Hidayat Humaid and Samsudin; Literature Search, Topo Yopo and Hidayat Humaid. All authors have read and agreed to the published version of the manuscript.

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