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PUZZLE-BASED LEARNING TO ENHANCE BODY PARTS KNOWLEDGE IN SECOND-GRADE STUDENTS WITH INTELLECTUAL DISABILITIES AT SLB NEGERI KARANGANYAR

Muhammad Hamdany Munawwa*, Munawir Yusuf, Dewi Sri Rejeki

Special Education Study Program, Faculty of Teacher Training and Education, Universitas Sebelas Maret, Surakarta, Indonesia 57126

Corresponding Email: m.hamdanymunawwa@student.uns.ac.id

Abstract

Special schools are educational institutions specifically designed for students with intellectual disabilities. Students with intellectual disabilities are often referred to as children with special needs who experience limitations in their cognitive abilities ranging from mild to severe. This study aims to determine whether puzzle-based learning can enhance knowledge about body parts in second-grade mentally disabled children at SLB Negeri Karanganyar. The research approach used is quantitative saturation sampling. Data collection for the research used a written test instrument with a total of 11 multiple-choice questions. The data analysis technique used to test the research hypothesis is the Wilcoxon Sign Rank Test. The results of this study show an increase in students' scores from 56.67 in the pretest to 83.33 in the posttest. The conclusion of this study is that puzzle-based learning games have an impact on improving knowledge about body parts for second-grade students with intellectual disabilities at SLB Negeri Karanganyar.

Keywords: Intellectual disability, puzzle games, body parts

Abstrak

Sekolah luar biasa merupakan lembaga pendidikan yang dirancang khusus untuk peserta didik tunagrahita. Peserta didik dengan tunagrahita seringkali disebut sebagai anak berkebutuhan khusus yang mengalami keterbatasan dalam kemampuan kognitifnya dari yang ringan hingga sangat berat. Penelitian ini bertujuan untuk mengetahui apakah pembelajaranan berbasis permainan *puzzle* dapat meningkatkan pengetahuan tentang anggota tubuh pada anak tunagrahita kelas II di SLB Negeri Karanganyar. Pendekatan penelitian yang digunakan adalah kuantitatif saturation sampling. Pengambilan data penelitian menggunakan instrumen tes tertulis dengan jumlah 11 soal pilihan ganda. Teknik analisis data yang digunakan untuk menguji hipotesis penelitian adalah *Wilcoxon Sign Rank Test*. Hasil penelitian ini menunjukkan peningkatan nilai peserta didik pada hasil *pretest* sebesar 56,67 menjadi 83,33 pada hasil *posttest*. Kesimpulan dari penelitian ini adalah permainan pembelajaran berbasis permainan *puzzle* berpengaruh terhadap peningkatan pengetahuan tentang anggota tubuh bagi siswa kelas II tunagrahita di SLB Negeri Karanganyar.

Kata kunci: Tunagrahita, permainan *puzzle*, pengenalan anggota tubuh

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INTRODUCTION

Education is an important aspect of human nature and is the right and duty of every individual in this world, including children with special needs, to receive education. Every individual, including children with special needs, also has the right to receive education, as stipulated in Law No. 39/1999 Article 54 on Human Rights, which means that all children with physical and/or mental disabilities have the right to receive care, education, training, and special assistance funded by the state to uphold their dignity, promote self-improvement, and facilitate their participation in social and national life.

School for Special Needs (SLB) are educational institutions specifically designed for students with intellectual disabilities. Students with intellectual disabilities are often referred to as children with special needs who experience limitations in their cognitive abilities, such as reduced thinking skills, strength, value, quality, and quantity (Desiningrum, 2017). According to (Kauffman & Hallahan, 2011), intellectual disability is defined in two parts: first, intellectual disability is a serious impairment that occurs before the age of 22, involving mental, physical, or both types of disorders. This condition usually lasts a lifetime and causes significant limitations. And the second is that children aged from birth to 9 years, with significant developmental delays or certain congenital conditions, can be considered to have developmental disabilities even if they do not yet meet the three criteria above, as long as without services or support, they are likely to meet those criteria in the future. Meanwhile, the definition of intellectual disability according to Isyani & Esser (2017) intellectual disability is a condition where a person experiences significant limitations in intellectual functioning and adaptive behavior. According to (Supena, 2015), children with intellectual disabilities are divided into 4 groups, namely: 1) Mild intellectual disability (IQ: 55-69); 2) Moderate intellectual disability (IQ: 40-54); 3) Severe intellectual disability (IQ: 25-39); 4) Profound intellectual disability. (IQ: dibawah 25).

In the Merdeka Curriculum for grade II in phase A within the IPAS Understanding element, students are already required to recognize parts of the body and senses. (Kusumaningrum, 2015:2) the introduction of body parts is one of the very important early learning objectives. By understanding the parts of the body and their functions, learners will have a better understanding of themselves. For example, students become familiar with parts of their body such as the eyes, hands, nose, etc. Ariadi and Heru (2017) divide the body parts into four sections, namely the head, torso, arms, and legs. The goal of teaching body parts to students with intellectual disabilities is to build a comprehensive understanding of body parts. In addition to knowing the names of body parts, students are also encouraged to understand the function of each part. Thus, it is hoped that the students can develop self-awareness and self-care skills (Sari, 2019).

The strategy or effort that can be made to improve the understanding of students with intellectual disabilities regarding the ability to recognize body parts is through puzzle-based learning. Sufi (2016), puzzle media has great potential in stimulating the cognitive development of students with intellectual disabilities. Puzzle is an educational game medium that uses pieces of images, boxes, letters, and numbers designed to engage learners in completing it quickly and correctly. (Maulida & Zulfitria, 2018). A puzzle is defined as a game that can enhance hand-eye coordination and fine motor skills. Simple puzzles typically comprise two or three components that need to be reassembled into a cohesive whole. Bahar and Risnawati (2019).

According to Tilong (2016), puzzle games offer various benefits for children's development, including stimulating cognitive development, training fine motor skills, and enhancing creativity. There are advantages and disadvantages in puzzle games. The advantages of puzzle games according

to (Ayu, 2014) are that puzzles have the characteristic of concrete images, allowing learners to obtain direct and clear visual perceptions. The use of visual images in puzzles serves as an alternative when real objects are not available, and visual media like images can enhance learners' interest. Besides the advantages, there are also disadvantages in puzzle games, including that puzzles predominantly use the sense of sight, overly complex puzzle images are less effective in learning, and puzzles are also less effective when applied in large groups.

There are objectives in puzzle games according to (Prima, 2016), including: group puzzle games can train joint strategies, foster a sense of togetherness, and develop cooperation skills.

The purpose of this research is to assist students with intellectual disabilities through puzzle-based learning in recognizing their body parts.

METHOD

This research is a quantitative study employing an experimental method with a One-Group Pretest-Posttest design (Creswell, 2014). In this study, the same group of students was assessed through a pretest before the treatment to measure their initial ability to recognize body parts. Following the intervention, a posttest was conducted to evaluate any improvements. The treatment involved the implementation of puzzle-based learning, an approach known to enhance cognitive engagement and retention in children with intellectual disabilities (Shin, Sutherland, Shin, & Conroy, 2020).

The subjects of this study were second-grade students with intellectual disabilities at SLB Negeri Karanganyar, totaling six (6) students who had demonstrated difficulties in recognizing body parts. These students were selected through a purposive sampling technique, ensuring that participants met the study's criteria of needing improvement in body part recognition (Palinkas et al., 2015).

To collect data, structured observation and assessment tests were used, documenting students' responses and progress throughout the intervention. The data was analyzed using a non-parametric statistical test, specifically the Wilcoxon Signed Rank Test, to determine whether there was a significant difference between pretest and posttest scores (Field, 2018). This statistical approach was chosen due to the small sample size and the non-normal distribution of data, ensuring a reliable measure of the treatment's effectiveness.

The research procedure followed ethical considerations, ensuring confidentiality and informed consent from the school and guardians of the participants, adhering to ethical research guidelines for studies involving children with disabilities (American Psychological Association [APA], 2020). The study aimed to provide empirical evidence on the effectiveness of puzzle-based learning in improving body parts recognition among students

with intellectual disabilities, contributing to the development of more effective special education strategies (Zigmond & Kloo, 2017).

RESULTS AND DISCUSSION

The objective of this research is to determine whether puzzle-based learning can enhance knowledge about body parts in second-grade mentally challenged children at SLB Negeri Karanganyar. This study uses the One-group Pretest-posttest Research Design method with data collection techniques in the form of tests. The test was conducted in three stages of learning. Each stage of learning, before the treatment, began with a pretest and after the learning, a posttest was conducted. The tests used in the pretest and posttest in this study were in the form of multiple-choice questions. Result data in this research in the form of pretest and posttest score results. The result of the pretest was obtained before students with intellectual dissabilities got treatment. Meanwhile, the result of the posttest was obtained after students with intellectual dissabilities got treatment can be seen in table 1.

Tabel 1. Pretest and Posttest Scores Comparison of Participants

No	Name/Initial	Pretest score	Posttest score	Different
1.	FJ	20	70	50
2.	WT	20	80	60
3.	EK	90	110	20
4.	QN	70	80	10
5.	NY	70	80	10
6.	ZH	70	80	10
Average Score		56.67	83.33	
Minimum Score		20	70	
Maximum Score		90	110	

Based on the table above, it can be seen that the average pretest score is 56.67 and it improved in the posttest with a score of 83.33. The lowest pretest score was 20, which increased to 70 in the posttest, and the highest pretest score was 90, which increased to 110 in the posttest. There is a significant improvement in the children's posttest results. Based on the results, it can be seen that puzzle-based learning has an impact on improving knowledge about body parts for second-grade students with intellectual disabilities at SLB Negeri Karanganyar.

Data analysis was obtained using the Wilcoxon Sign Rank Test with the help of SPSS version 26. The results of the data analysis based on the Wilcoxon Sign Rank Test are shown in table 2.

Table 2. Results of the Wilcoxon Signed Rank Test for Pretest and Posttest Scores

		N	*Mean Rank*	*Sum of Ranks*
Posttest - Pretest	*Negative Ranks*	0[a]	,00	,00
	Positive Ranks	6[b]	3,50	21,00
	Ties	0[c]		
	Total	6		

a. *Posttest < Pretest*

b. *Posttest > Pretest*

c. *Posttest = Pretest*

Based on the data analysis results above, it can be explained that the negative rank value has a result of 0 for N, Mean Rank, and Sum of Rank. This result indicates no decrease from the pretest to the posttest results. Next, in the Positive Rank, the result shows N is 6, meaning there are 6 students who experienced an increase in scores from the pretest to the posttest. With a Mean Rank result of 3.50 and a Sum of Rank result of 21.00. Ties in the data analysis results yielded a score of 0, indicating that there were no identical results in the pretest and posttest outcomes. Next, the results of the Wilcoxon Sign Rank Test are explained in table 3.

Table 3. Wilcoxon Signed Rank Test Results for Pretest and Posttest Scores

Test Statistics[a]	
	Posttest - Pretest
Z	-2,226[b]
Asymp. Sig. (2-tailed)	,026

a. Wilcoxon Signed Ranks Test

b. Based on negative ranks.

Based on the table above, it shows that the Z value is -2.226 and the Asymp. Sig. (2-tailed) is 0.026 at a significance level of 0.05. Based on these results, it appears that the Z result is less than 0.05, thus it can be concluded that there is an effect of puzzle-based learning on improving knowledge about body parts for second-grade mentally disabled students at SLB Negeri Karanganyar.

This research can be successful because the puzzles used in this study are puzzles that have been adjusted based on the needs of the research, specifically regarding the introduction of body parts. With the implementation of puzzle-based media learning, students become more active in participating in learning activities and are brave enough to show body parts while assembling the puzzles. This is in line with the opinion of Safitri et al. (2021) that puzzle learning media can make learning more enjoyable and less monotonous. Students can learn while playing, which makes the classroom atmosphere more lively and engaging. Additionally, according to Safitri et al. (2021), puzzle media can develop motor and cognitive skills because the process of assembling puzzle pieces involves problem-solving and logical thinking.

CONCLUSION

Referring to the analyzed data and the discussion results, it can be concluded that puzzle-based learning has an impact on improving knowledge about body parts for second-grade students with intellectual disabilities at SLB Negeri Karanganyar. This is because puzzle-based learning is enjoyable and not boring, thereby enhancing students' understanding of body parts.

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