Pegem Journal of Education and Instruction, Vol. 14, No. 4 , 2024 (pp. 331-338)

Research Article **WWW.PEGEGOG.NET**

Improvement of Student with Intellectual Disability Practice Grasping Skills with a Combination of Fine Motor Games

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Abstract

Intellectual disability causes inhibition of motor skills development, both fine and gross motor skills. The ability to grip is one of the fine motor skills whose growth is hampered. Lack of grasping ability causes students to be unable to carry out activities, such as cutting, writing, and other daily activities. Even though these activities are needed by all children, including intellectual disability children. Using game learning media, a combination of fine motor skills can train the grasping ability of intellectual disability students. Based on this, the purpose of this study is to determine whether there is an increase in students' fine motor skills, especially grasping, using a combination of fine motor games. The research method uses a Single Subject Research Design. Data collection was carried out in two series with an A-B-A research design. The sample used is one student with mild intellectual disability in grade IV in Special School in Malang Regency who has a poor grasping ability. The results showed that the fine motor skills of holding intellectual disability students increased by 89% using a combination of fine motor game media. From the study results, it can know that there is a significant increase in students' fine motor skills when using a combination of fine motor games. Using a variety of fine motor game media also makes students look excited, motivated, and willing to talk, and when given instructions, they do it right away.

Keywords: children with intellectual disability, fine motor, grasping ability

Introduction

Student with intellectual disability has difficulty carrying out their daily activities and education, which requires special services or assistance (Bratanata, 1979). The student with intellectual disabilities are students who have intellectual disorders and are not capable of social communication; their intellectual mentality is below the normal average, which causes them to experience difficulties in academics, communication, and social (Puspitasari et al., 2016). Student with intellectual disabilities is congenital disorders that make it difficult for children to reach the stage of development in terms of physical, psychic, intellectual, emotional, attitude, and behavior (Atmaja 2017).

Based on the Binet scale and the Weschler scale, students with intellectual disabilities are grouped into 3: mild, moderate, and severe. Mild has an IQ of 68-52 according to the Binet scale and 69-55 according to the Weschler scale. Students can still learn to read, write, and do simple counting. Then the moderate has an IQ of 51-36 according to the Binet scale and 54-40 according to the Weschler scale. They have difficulties reading, writing, and simple numeracy but can still do simple care and self-help activities. Then the severe have an IQ of 32-20 according to the Binet scale and 39-25 according to the Weschler scale. They need total assistance in all aspects (Atmaja, 2017).

Every child has their motor skills development. Motor skills development is strongly influenced by genetic growth and brain development in tandem (Destiyani, Prasetyowati, and Purwadi, 2019). Motor development is related to the development of students' ability to move. The development of students' motor skills can be seen through the movements and games they can do (Sujiono, Sumantri, and Chandrawati, 2014). At the age of 10, children's motor skills have exceeded those set by the Ministry of Education and Culture of the Republic of Indonesia. The Ministry of Education and Culture of the Republic of Indonesia (2014) explained that at the age of 6 years, a child at least has fine motor skills, namely

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How to cite this ar ticle: Ediyanto E, Jatiningsiwi TG, Huda A, Suhendri S (2024). Improvement of Student with Intellectual Disability Practice Grasping Skills with a Combination of Fine Motor Games. Pegem Journal of Education and Instruction, Vol. 14, No. 4, 2024, 331-338

Source of support: Nil

Conflict of interest: None

DOI: 10.47750/pegegog.14.04.30

Received: 23.01.2024

Accepted : 09.05.2024 **Publised :** 01.09.2024

using stationery and cutlery correctly, cutting according to patterns, and sticking pictures appropriately. Yoneda and Miura (2021) argue that parents of children with disabilities needs support systems provided by educational institutions and government/administrative agencies.

Fine motor skills require the ability to manage small muscles and hand-eye coordination, such as grasping objects, cutting, pasting, writing, and drawing (Rahyubi, 2012). One of the basic fine motor skills is grasping. The late development of the fine motor ability to grasp is one of the impacts of intellectual disability. The lack of grasping fine motor skills causes students to be unable to carry out activities that require basic grasping abilities, such as cutting, writing, and doing daily activities. Then the fine motor ability to grasp needs to be optimized so children can carry out daily activities optimally.

In reality, the fine motor abilities of students with intellectual disabilities are under the age of their development. Shree and Shukla (2016) explained that one of the characteristics of a student with an intellectual disability is its physical characteristics, student with intellectual disability can have problems in their physique such as physical, motor, orthopedic diseases, visual and hearing impairments, and health problems. Students with intellectual disabilities have a variety of motor disorders; one of them is in their fine motor abilities. At the age of 10, students with intellectual disabilities may not be able to perform fine motor activities such as using stationary and cutlery correctly, cutting according to patterns, and sticking pictures appropriately. This incompetence is due to the basic fine motor abilities that have not yet been fully developed. One of the basic fine motor skills is grasping. Good grasping ability can make students do advanced abilities easier that require grasping activities.

Optimizing fine motor ability to grasp can be done by providing appropriate learning services. Learning to help students achieve good grasping fine motor skills can be provided through learning media. Learning media is an intermediary that uses specific tools to convey material from teachers to students to facilitate the process of understanding (Pakpahan et al., 2020). Learning media can be in the form of audio, visual, and audiovisual media (Hasanah, 2019). Montessori game combination media is an example of a game medium that focuses on student development in the motor, sensory, and academic realms. This media can help improve students' fine motor ability to grasp.

The combination medium of fine motor games is designed in four games to help improve students' fine motor skills of grasping. This medium contains games that can stimulate the muscles of the palms and wrists to practice grasping. This box consists of four kinds of games that require the ability of palm and wrist muscles when grasping: puzzles, legos, pompoms, and kinetic sand. The fine motor ability to grasp is important to be trained because this ability is the ability that is the basis for carrying out advanced activities that require good grasping ability.

Soemarna et al. (2023) argue that motor development is needed for children with complex developmental delays. Several previous studies have shown that training students' fine motor skills with game media influences improving students' fine motor skills (Mutia & Iswari, 2020; Yosefa, 2021). Mutia & Iswari (2020) showed that the basic lego media used during the intervention could improve students' fine motor skills from 20% to 80%. Then Yosefa (2021) also showed that there was a positive influence on students' ability to struggle from a percentage of 57% to 79%.

This research must be carried out to determine the fine motor ability to grasp students with an intellectual disability through a combination medium of fine motor games. In addition, the development of fine motor game media needs to be implemented to optimize the grasping ability of students with intellectual disabilities. The lack of exploration of the development of fine motor game media has an impact on the ability of the fine motor to grasp students with intellectual disabilities who have not been able to develop optimally.

Purpose of Research

The problem of grasping ability occurs in one of the Special Schools (SLB) in Malang Regency for students with intellectual disabilities. In a preliminary study at one of the Special Schools (SLB) in Malang Regency, there was a student with an intellectual disability with fine motor ability to grasp that was not yet following his developmental age. The student does not yet have advanced grasping skills such as holding a pencil correctly, cutting according to patterns, and sticking to drawings, so the student is suspected of having a weak grasping ability. This study was conducted to improve students' grasping ability using a combination of fine motor games through play and practice activities.

Method

The current study method is experimental with an SSR (Single Subject Research) design. Sunanto et al. (2005) explained that SSR is a method to change target behavior with interventions carried out repeatedly until changes in behavior appear. This research applies quantitative methods. Sugiyono (2016) explained that the quantitative approach is applied to research a population or sample. The research design used A-B-A. Sunanto (2005) said that the A-B-A design is a development of the basic A-B design, which is characterized by the repetition of the baseline condition (A) after the intervention condition (B). Data collection is carried out in a time series.

Series 1 measures the subject without intervention through a combination of fine motor play media. Then, Series 2 was measured on the subject by being given intervention in the form of a variety of fine motor play media.

The study subject used is one student with an intellectual disability who had a weak grasping ability. The student was chosen based on observation in the preliminary studies that have been carried out. The subject has not been able to use stationery and cutlery properly, cut according to the pattern, and stick the image appropriately. The subject is suitable for the current study because it lacks the grasping ability and can be trained to improve its grasping ability.

The data collection methods carried out are performance tests and observations. The test method is used to obtain quantitative data in the form of activities carried out by subjects which are assessed using an assessment of performance criteria. The tests given are in the form of activity instructions in the Individual Learning Program, which are carried out in stages in each condition both in Series 1 and Series 2. The observation method was carried out on three conditions in each series: baseline condition 1, intervention condition, and baseline condition 2. This observation is carried out to observe the subject's response when completing the game mission under each condition in each series.

The validation of the instruments carried out is the validation of the Individual Learning Program (ILP) and the validation of observation guidelines with media that expert lecturers will test. Based on the results of the validity test carried out by ILP experts, namely lecturers, it can be seen that the total score on the validity test instrument is 100. The degree of conformity of the instrument is 92%. Based on that result, the research instruments are worth using without revision. Based on the results of the validity test carried out by media experts, namely lecturers, it can be seen that the total score on the validity test instrument is 72. The degree of conformity of the instrument is 93%. Based on that result, the research instruments are worth using without revision.

The analysis technique used is the descriptive statistical analysis by analyzing data in each condition and between conditions of each series. The statistical tests used are the Wilcoxon test and the n-gain test. The Wilcoxon test is a non-parametric statistical method to compare the differences between two groups as an alternative to the paired t-test if the data is not normally distributed (Sugiyono, 2016). The N-Gain test was used to test the increase in the average value before and after treatment in one group (Sundayana, 2014).

Results

Based on Figure 1, throughout the implementation of baseline 1 Series 1 conditions, the student appeared ordinary and expressionless and did not want to speak. When instructed, there is a slight pause or not immediately worked. In tracing activities, the student still finds it difficult to hold the pencil correctly. The student's hand is not yet strong when holding the pencil; the pencil is positioned between the middle finger and the ring finger; when the pencil position is justified, the pencil position will return to its original state. This position results in the student having difficulty writing; besides that, the student's hand is still weak when pressing the pencil on the paper to write. When tracing, the student did not follow the dots. The student is not focusing on the worksheet in front of it but looking around. It means the student fully assisted in completing this tracing task. In matching plasticine color plasticine with the image, the student can take plasticine from the container but with the repetition of the command. The student had not been able to match th e color of plasticine with the color on the worksheet, but the student was quite capable of recognizing the color of the fishing rod from the teacher. The student can also take and return plasticine to its original container. The student needs to assist entirely in work and appears to lack confidence when performing instructions. The student's fine motor ability to grasp in baseline conditions 1 (A1) in the first and second sessions obtained a score of 33%; in the third, fourth, and fifth sessions, there was an increase in the score to 34%. This score's results show the data's stability at baseline condition 1 (A1).

Based on Figure 1, throughout the implementation of the Series 1 intervention conditions, the student appeared ordinary and expressionless and did not want to speak. When given instructions, there is a slight pause or not immediately worked. In sticking to the college, the student is less able to glue according to the part to be glued, tends to just glue, and ignores the boundary line. When given glue, the hand's position when holding the glue is correct. When taking a piece of paper, the student is quite capable; then, when attaching it, he ignores the part to which the paper will be connected, so several times, the student sticks it not where it should be. The student also picked up the wrong color several times. As a result, the student lacks focus when working and lacks confidence. During the work, the student was assisted by the teacher. The student's fine motor ability to grasp in intervention conditions (B) in the first and second sessions obtained a score of 34%, and in the third, fourth, and fifth sessions, there was an increase in the score to 38%. This score's results show the data's stability on the intervention condition (B).

As a result of observation in the Baseline 2 Series 1 conditions, the student appeared ordinary and expressionless and did not want to speak. When instructed, the student slightly pauses or does not work immediately; the student's activities are almost similar to the Baseline 1 condition. Still,

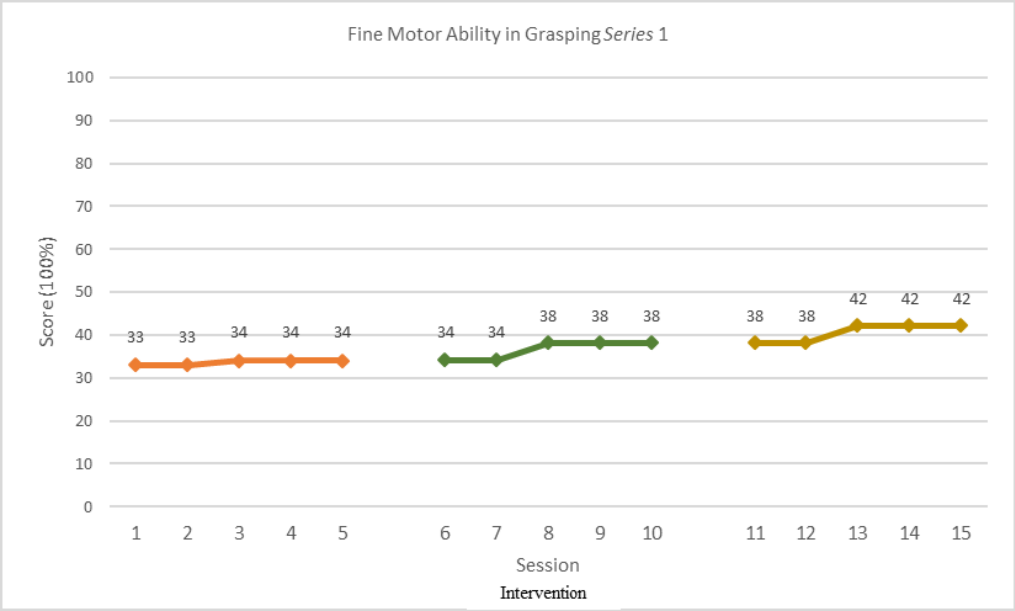

Fig. 1: Results of Fine Motor Ability to Grasp in Series 1

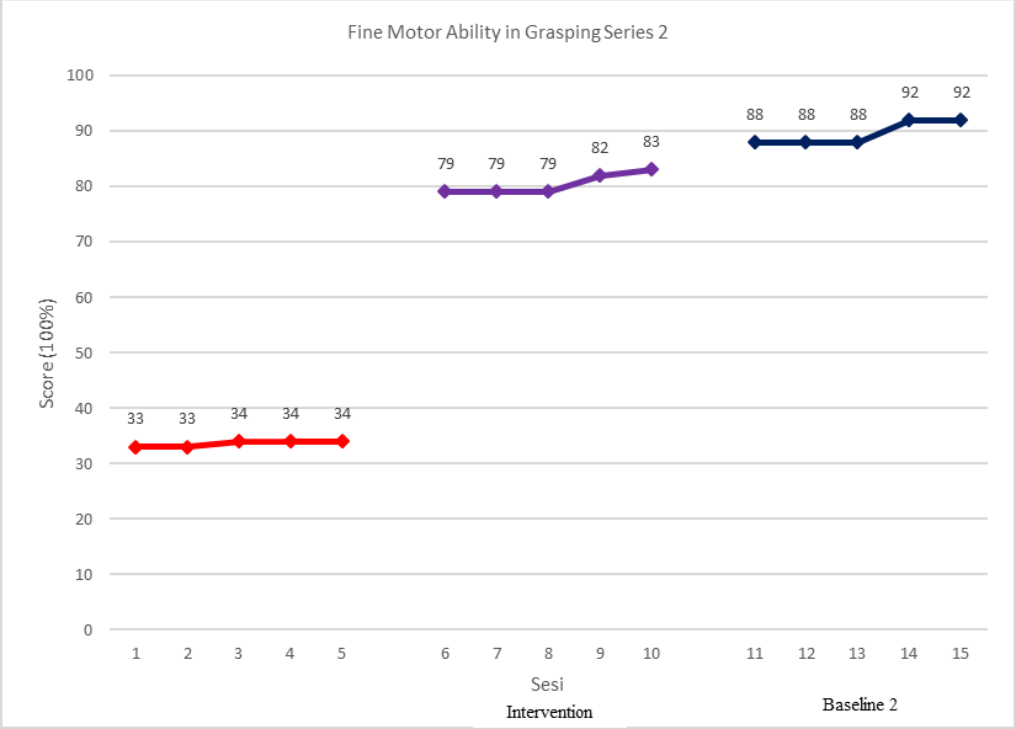

Fig. 2: Results of Fine Motor Ability to Grasp Series 2

the student's hand is already somewhat more robust than before. Even though he still finds it difficult to hold the pencil properly. He's hand is slightly strong when holding the pencil, positioned between the middle and ring fingers; when the pencil position is justified, the pencil position will return to its original state. This position results in the student having difficulty writing; besides that, the student's hand is still weak when pressing the pencil on the paper to write. When tracing, he does not follow the dots. He also lacks focus, not looking at the worksheet in front of him but looking around. It means the student is fully assisted in completing this slashing task. In matching the plasticine color with the image, he can take plasticine from the container but with the repetition of the command. The student can slightly match the color of

plasticine with the color on the worksheet, and he is quite capable of recognizing the color of the fishing rod from the teacher. He can also take and return plasticine to its original container. In its condition, he almost assisted entirely in work and appears to lack confidence when performing instructions. The fine motor ability to grasp the student in baseline conditions 2 (A2) in the first and second sessions obtained a score of 38%; in the second, third, and fourth sessions, there was an increase in the score to 42%. This score's results show the data's stability at Baseline condition 2 (A2).

Baseline 1 Series 2 conditions, the student appeared ordinary and expressionless, did not want to speak, and when instructed, there was a slight pause or not work immediately. In tracing activities, the subject still finds it difficult to hold the pencil correctly. The subject's hand is not yet strong when holding the pencil; the pencil the subject holds is positioned between the middle finger and the ring finger; when the pencil position is justified, the pencil position will return to its original state. This position results in the subject having difficulty writing; besides that, the subject's hand is also still weak when pressing the pencil on the paper to write. When tracing, the subject did not follow the dots. The subject also had a lack of focus on the worksheet and looking around. It means the subject is fully assisted in completing this tracing task. In matching the plasticine color with the image, the subject can take plasticine from the container but with the repetition of the command. The subject had not been able to match the color of plasticine with the color on the worksheet, but the subject was quite capable of recognizing the color of the fishing rod from the teacher. The subject is also quite capable of taking and returning plasticine to its original container. The subject is assisted entirely in work and appears to lack confidence when performing instructions. The fine motor ability to grasp the subject in baseline conditions 1 (A1) in the first and second sessions obtained a score of 33%; in the third, fourth, and fifth sessions, there was an increase in the score to 34%. This score's results show the data's stability at baseline condition 1 (A1).

During the implementation of the Series 2 intervention, the subject seemed interested and happy. The subject appears eager to play immediately, begins to want to be spoken to, and is willing to reply to the conversation; the instructions are directly carried out. The subject is quite confident and not afraid of being wrong when playing. In puzzle playing activities, the subject can pick up and put puzzle pieces, the grip is strong enough, and the subject is also quite capable of putting pieces in place but often misplaced so that the teacher helps. In the activity of composing legos, the subject can take legos from the box; the subject is quite able to group legos by color but needs the help of a teacher. The subject is also quite capable and creative in assembling legos into trains. In grouping pompoms, the subject is quite capable of using a clamp and clamping a pompom, but when clamping is sometimes wrong. The subject is also placing the pompom quite capable. Then, he picked up according to the color of the bowl, also quite understanding about the color. In kinetic sand play activities, the subject can move the sand to another container using a spoon; how to hold the spoon is grasped. However, the force was too strong and could not be controlled, so in the 4th session, the spoon was broken because when moving the sand, the subject pressed the sand firmly. When forming sand with a mold, the subject is not yet strong enough to push the sand into the mold until there is still free space. The subject can place a mold filled with sand on the container and then remove the mold, so the sand is printed to form an animal. The fine motor ability to grasp the subject in intervention conditions (B) in the first, second, and third sessions obtained a score of 79%, in the fourth session, there was an increase in the score to 82%, and in the fifth session, there was an increase in the score to 83%. This score's results show the data's stability on the intervention condition (B).

In the implementation of baseline 2 Series 2 conditions, the subject appears excited, willing to talk to, and when given instructions, works directly. In slashing activities, the subject is quite capable of holding the pencil correctly. The subject's hand is strong enough when holding the pencil, and the subject's hand is also quite capable when pressing the pencil on the paper to write. When slashing, the subject can follow the dots but with the direction of the teacher. The subject is also capable enough to focus on seeing the worksheet in front of him. The subject is still assisted in completing this slashing task. In the activity of matching the color of plasticine with the image, the subject could take plasticine from the container without a repetition of the command. The subject is quite capable of matching the color of plasticine with the color on the worksheet, and the subject is quite capable of recognizing colors. The subject was also able to take and return plasticine to its original container. The subject is assisted a little while working and seems quite confident when performing instructions. The fine motor ability to grasp the subject in baseline conditions 2 (A2) in the first to the third session obtained a score of 88%; in the fourth and fifth sessions, there was an increase in the score to 92%. This score's results show the data's stability at baseline condition 2 (A2).

Based on the Wilcoxon signed rank test in Series 1, it is known that the value of T (0) < Tcritic (1), then H0 is rejected and H1 is accepted, so it is concluded that there is an increase in fine motor ability to grasp students with intellectual disability using collage media. The n-gain test found that the

fine motor ability to grasp intellectual disability students by 10%, which belongs to the category of less. The ability to grasp the subject after the intervention is still weak. The subject can still not emphasize the pencil, and when tracing, it still goes out of the dotted line.

Based on the Wilcoxon signed rank test in Series 2, it is known that if the value of T (0) < Tcritic (1), then H0 is rejected and H1 is accepted, so it is concluded that there is an increase in fine motor ability to grasp students with intellectual disability using combined media of fine motor games. The n-gain test found that the fine motor ability to grasp intellectual disability students was 89%, which belonged to the high category. The ability to grasp the subject after the intervention is already good. The subject can hold the pencil well, and when slashing, it is enough to follow the line.

Based on the results of the Wilcoxon rank sum test, it is known that the value of W (15) < Wcritic (17), then H0 is rejected and H1 is accepted, so it is concluded that there is a significant difference in fine motor ability to grasp students with intellectual disability between using collage media and the combined media of fine motor games. Furthermore, the n-gain test found that the increase in students' fine motor skills using college media was 10%, and the increase in students' fine motor skills used the combined media of fine motor games by 89%. So it is known that there is a significant improvement in students' fine motor skills when using the combined media of fine motor games.

Discussion

Students with intellectual disabilities can have various motor barriers, one of which is the fine motor ability to grasp. The ability to grasp students with intellectual disabilities has obstacles in their development that are influenced by brain growth and development. Regular 10-year-old students can perform activities such as writing, cutting, and sticking well. But students with intellectual disabilities have not been able to do well. The provision of interventions in the form of media increased the ability to grasp students with intellectual disabilities.

Media in the form of a combination of fine motor skills can help students improve their grasping ability. For example, game media is more accessible for students with intellectual disabilities to understand and remember because in learning to practice fine motor skills to grasp through hands-on practice. This combination of games is a puzzle game, lego, pompom, and kinetic sand.

Puzzles are media or student learning aids that are played by looking for pieces of objects and arranging them into a whole. Oktaviana (2017) mentioned that teachers use puzzles as a tool in the learning process by looking for pieces and compiling them. There are various puzzle shapes, such as animal, plant, geometry, letters, numbers, and nature drawing puzzles. Puzzles help train motor, cognitive, hand-eye coordination, training patience, and solving problems (Khoiriyyah, 2019). Media by building puzzles can involve visuomotor integration to precisely coordinate small muscle movements to train the development of fine motor skills. (Davis & Matthews, 2010; Gallahue et al., 2012; Korkman et al., 2007).

Lego is a collection of colorful blocks that can be disassembled to create any shape. Jalil (2019) explained that legos are constructive toys in the form of pieces. Lego can assemble into various shapes. Lego is useful for training motor, cognitive, hand-eye coordination, and honing skills. Lego can direct students' attitudes, academic achievement and skills to be better (Usengül & Bahçeci, 2020).

Pompom is a toy in the form of small balls made of wool, commonly used as decoration in women's clothing (Waty, 2019). Pompoms are made from wool or dacron and are shaped round and dyed until they become a colorful sphere. Pompom in learning can be used as a medium for counting, grouping, and matching. In addition, pompom games can train students' motor, cognitive, patience, and creativity abilities.

Kinetic sand is a game from an American toy company called Relevant Play. This toy is also known as magic sand. This sand's structure is similar to beach sand's design and has a wide selection of colors. This sand can be formed as desired (Atika, 2020). Kinetic sand is easier to create because of its smoother structure. Kinetic sand helps stimulate sensory, especially the sense of touch and motor, and as a medium to help students practice writing and drawing. In other hand, the worksheet is effectively used as a medium in cutting and pasting activities to improve the fine motor skills of Intelligence Impaired Children (Putri, Susetyo, Akhlan; 2022). In addition, interactive multimedia can support interesting interactions and a fun learning experience between teachers, students, and learning (Yuniarti et al., 2022).

The combination of these four games can positively influence and improve the fine motor ability to grasp lightly impaired students, so it is necessary to form a unity of these four game combinations. Therefore, the development of this game combination media is needed, which can later be named the 24.7 FM G-Box media (24/7 Fine Motor Grab Box), a handheld fine motor game box media that can do any time. The 24.7 FM G-Box media combines fine motor games are Puzzles, Lego, Pompom, and Kinetic sand.

Conclusion

The combination media (The 24.7 FM G-Box media/ combination of fine motor games Puzzles, Lego, Pompom, and Kinetic sand) of the fine motor game can improve

the grasping ability of grade IV students with intellectual disabilities. There is a significant difference in the fine motor ability to grasp students with intellectual disabilities between not using and using a combination media of fine motor games. It is known that the increase in students' fine motor skills when not using the combination media of fine motor games by 10% and the increase in students' fine motor skills using the combination media of fine motor games by 89%. Using a combination medium o f fine motor games also makes students seem excited, motivated, and willing to talk, and when given instructions, they are directly done.

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