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Development of plant reproduction props to increase motivation and communication of mentally retarded students in SLB Widya Bhakti Semarang

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Abstract. This research aims are to determine the development of plant reproduction props to increase the motivation and communication of mentally retarded students in SLB Widya Bhakti Semarang. This research is a research and development that produces development products in the form of plant reproduction props. In this research, the population in this research was eighth grade students of SLB C Widya Bhakti Semarang. Communication skills from 49.3% in the first meeting reached 93.75% in the sixth meeting, learning motivation from 49.5% in the first meeting to 93.5% in the sixth meeting, the average result of the pretest was 7.8 and average the average posttest value is 8.5, and the magnitude of the influence of plant reproduction props uses an effect size of 4,6 which is included in the category very large. Based on the results of the study, it can be concluded that there is a very large influence between plant reproduction props on communication skills and learning motivation of mentally retarded students at SMPLB C Widya Bhakti Semarang.

1. Introduction

Education is very important to create a smart, open, peaceful and democratic life, therefore, education reform must be done to improve the quality of education. The quality life of the nation is very determined by the quality of education [1]. Improving the quality of education is the duty of all parties, especially teachers as educators. The teacher will create quality students through the learning process [2]. The desired expectation of the teaching process is all deliberate efforts in order to provide motivation, guidance, direction, and enthusiasm to students so that the goals are achieved [3]. Various efforts to improve the quality of education are carried out, including by improving the quality of the learning process. In the learning process besides using the model also uses the help of learning media [4].

Learning media are tools, methods, and techniques used between teachers and students in the learning process to encourage the achievement of learning objectives effectively. The use of media will also make it easier for students to understand the lesson and be more interesting, so that the learning process can take place in an effective manner. Communication and interaction between teacher and student can be effective and efficient. In the process of learning students need to be encouraged not only to see and



hear, but also to do something to truly understand the concept and be able to apply it in everyday life [5]. Through concepts one can evaluate information, make decisions, and act according to the concept [6]. Learning activities in each step / stage of learning (introduction, core, and closing), revised and / or added so that part or all of the learning activities at each stage facilitate learners to gain targeted knowledge and skills and develop character [7]. Pleasant learning process is the right of all students, including mentally retarded students.

Mental retardation is a term used to refer to children or people who have the intellectual capacity below average. Mentally retarded students are also part of the generation that must get the opportunity to develop themselves according to their potential. Keep in mind that disabled children are also children of the nation who can grow and develop into adults who have high self-esteem and self-esteem in leading and devoting themselves to the nation and state in the future [8].

Someone categorized as mental retardation is characterized by a state of development of lack of thinking power, and limited intellectual and social functions. This condition results in mentally retarded children needing special education. Mentally retarded children, namely "children who are identified as having a level of intelligence that is so low or below average, so to carry out developmental tasks requires special assistance, including the need for education and guidance programs". Learning media needed in the learning process of mentally retarded children are learning media that are in accordance with the characteristics of the subjects, the needs and characteristics of mentally retarded children. The existence of appropriate learning media is expected to help students learn science learning better and easily accepted. The use of learning media in the learning process can arouse desire and think critically, generate motivation and stimulation of learning activities, and even bring psychological influence to students [9]. Mentally retarded students must be treated more specifically than treating normal students, mental retardation is in desperate need of basic abilities both to compete in the global world and to support survival in the future, including communication skills and motivation.

Motivation itself is influenced from within as well as from outside influences of students. Motivation is a drive that comes from within and outside oneself which can encourage learning to achieve goals. The results of the Hamdu and Agustina study [10] showed that learning motivation had an effect of 48.1% on science learning achievement. Mental retardation is considered more in need of motivation both from within and from outside ourselves, this is because more tests of life will be experienced by mental retardation than normal children. Astuti et al [11] defines the difficulty of communicating feelings effectively, can be experienced by students at the junior level because it generally ranges between the ages of 12-15 years where the age is in the stage of adolescence. Students feel nervous when talking to people who have not been recognized, feel trembling when dealing with people, do not dare to express public opinion, and are afraid of being criticized. According to Astuti et al [11] communication not only conveys the content of the message but also determines the level of interpersonal relations. Community learning can occur if there is a two-way communication process.

In accordance with the 21st century learning paradigm which emphasizes to students to have thinking and learning skills. The skills developed include problem solving skills, critical thinking, collaboration, and communication skills. Rothertham & Willingham [12] noted that the success of a student depends on 21st century skills, so students must learn to have it. The 21st century can be said to be a century of knowledge.

To increase the motivation and communication of mental retardation, a medium for manipulative objects is used to achieve the learning process goals well. Teaching aids are learning media that convey an overview of the characteristics of the concepts being studied. Props are used to help clarify the subject matter presented so as to prevent the occurrence of verbalism in students. With teaching aids students are expected to be motivated in following the learning process. In the teaching and learning process, the most important thing is the way teachers teach or deliver lessons, including using teaching aids in teaching. Using props will provide material that will be easily accepted by students. In addition, it can attract students' attention and can stimulate students to think, but the use of educational media must see to whom the media will be given, so that the media used can have meaning in learning science [13]. Children with mental retardation are very slow to capture, so the use of teaching aids is very useful. The

benefits of using teaching aids for mentally disabled children are to attract children's motivation to learn so that children do not get bored quickly because mentally disabled children get bored very quickly to receive lessons, prevent verbalism that children only know words without understanding what they mean. that is heard or said by his friends even though they do not know the meaning said, with children's experience props will be given well, namely from the most concrete to the concrete things finally to things that are abstract, the child will get a deep understanding. Thus, the researchers have developed props of plant reproduction to increase the motivation and communication of mentally retarded students at SLB C Widya Bhakti Semarang.

2. Methods

This research is a research and development that produces development products in the form of plant reproduction props. This research and development uses a research model from Sugiyono [14] conducted in ten steps, namely (1) potential and problems; (2) data collection; (3) product design; (4) design validation; (5) design revisions; (6) product testing; (7) product revisions; (8) trial use; (9) product revisions; and (10) mass production.

The research subjects were divided into 2, namely: Small-scale trials: students of class VIII mental retardation (in the large trial class) as many as 2 students, and large-scale trials: students of class VIII SLB C Widya Bhakti Semarang as many as 6 students. Sampling is based on purposive sampling technique. The purposive sampling technique is a sampling technique with certain considerations, namely based on the science teacher's information.

3. Results and Discussion

The results of this study include the characteristics of plant reproduction props, the validity of plant reproduction props, improvement of communication skills and motivation to learn, and the practicality of plant reproduction props.

3.1. Characteristics of the Results Development of Plant Reproduction Props.

The development of plant breeding teaching aids for mentally retarded students uses the 2013 curriculum in accordance with Core Competencies (KI), Basic Competencies (KD), and the learning objectives of the Extraordinary School (SLB). Plant reproduction props are the development of pre-existing teaching aids. The purpose of the development of teaching aids is to refine and adjust to the needs and abilities of mentally retarded children. The characteristics of plant reproduction props that are developed are:

1. Has a 3D plant replica object that resembles the original.
2. Contains captions with large writing sizes and uses easy-to-understand language.
3. When closed 1x1 meter plant reproduction props, and when opened a plant reproduction props measuring 1x2.5 meters.
4. Made from lightweight cardboard and stereofoam that is easy to carry.
5. Contains 6 replicas of plant objects, namely: banana trees, coconut trees, lotus, princess ropes, sprouts and how to reproduce by grafting.

There are several plant reproduction learning media that have been there before, such as 2D images containing normal junior high school students' material, in the form of vegetative and generative breeding, besides there are smartbooks for normal elementary school students, but there are no plant reproduction props specifically for mentally retarded students contains easily understood languages. Therefore, plant reproduction props are developed which are expected to improve communication skills and learning motivation for mentally retarded students.

3.2. Analysis Results of the Validity Plant Reproduction Props

The fourth stage in research and development research design is design validation. At this stage plant reproduction props will be assessed by experts regarding their validity to be used in learning activities. There are 2 assessments of the validity of plant reproduction props, namely by media experts and props experts. Each expert is taken from 2 lecturers who are experts in the field and 1 class teacher who knows the ability of mentally retarded students. The results of the feasibility expert expert assessment in this

study have been declared feasible in the first stage, but still given to add some supporting objects. Therefore, props for plant breeding are said to be very suitable for use in learning activities for mentally retarded students with a percentage value of 85.18% (Table 3.1).

Table 3.1 Feasibility Test Results of Plant Breeding Teaching Tools by Props Experts

No.	Evaluator	Instance	Percentage (%)
1.	Pa-01	Lecturer at Department of Integrated Science, Faculty of Mathematics and Natural Science UNNES	91,67% (Very Worthy)
2.	Pa-02	Lecturer at Department of Integrated Science, Faculty of Mathematics and Natural Science UNNES	86,11% (Very Worthy)
3.	Pa-03	Teacher at SMPLB C Widya Bhakti Semarang	77,77% (Worthy)
Average			85,18% (Very Worthy)

The next step is the validation of material experts for plant reproduction props. The results of the assessment of material experts are not very different from the results of the expert assessment, in the first stage it was said to be very feasible with a percentage of 87.49% (Table 3.2).

Table 3.2 Test Results of the Validity Plant Reproduction Props by Material Experts

No.	Evaluator	Instance	Percentage (%)
1.	Pm-01	Lecturer at Department of Integrated Science, Faculty of Mathematics and Natural Science UNNES	90,62% (Very Worthy)
2.	Pm-02	Lecturer at Department of Integrated Science, Faculty of Mathematics and Natural Science UNNES	90,62% (Very Worthy)
3.	Pm-03	Teacher at SMPLB C Widya Bhakti Semarang	81,25% (Very Worthy)
Average			87,49% (Very Worthy)

Based on the overall results of plant reproduction props experts can be said to be very feasible and can be used for the learning process of mental retardation students, especially plant reproduction props.

3.3. The Results of Communication Skills Observation and Learning Motivation Observation for Students with Mentally Retarded

The results of the analysis of communication skills of mentally retarded students are obtained by using the observation sheet at each meeting in the science learning activities using plant reproduction props. Improved verbal communication skills of mentally retarded students can be seen from the average observer assessment at each meeting. Small-scale trials conducted 1 meeting, using 2 observers to observe the observations of the communication skills of 2 students.

Observation of the results of the observer sheet is weak mentally retarded students in the third indicator, namely expressing opinions. This is because the majority of mentally retarded students have difficulty speaking, so they do not dare to express their opinions in public. Based on the results of the study it can be seen that the observer's assessment of students' communication skills at the first meeting of 49% increased to 93% at the sixth meeting, this proves an increase in communication skills after the use of plant reproduction props. Communication skills of mentally retarded students can be said to be good if the value obtained from observers >66.67 and at the last meeting students' communication skills increased to 93%.

The use of varied media is very necessary in science learning. This is because the varied learning media can increase students' motivation in learning. The results of the analysis of learning motivation

for mentally retarded students were obtained using the observation sheet at each meeting in the science learning activities using plant reproduction props. Increased learning motivation for mentally retarded students can be seen from the average observer assessment at each meeting. Based on the results of the assessment, the two observers averaged 83.33% and 80.55%. Learning motivation of mentally retarded students can be said to be good if the value obtained from observers > 66.67 and on a small scale student learning motivation has been declared good, this is because small scale samples are high levels of mental retardation (IQ equivalent to junior high school students).

4). Results of Practical Analysis of Plant Reproduction Props

The main purpose of the development of plant reproduction props is to obtain practical teaching devices for mentally retarded students, but still complete, clear, solid, and easy to understand. Knowing the practicality of teaching aids by using questionnaire responses to the use of teaching aids by mental retardation on a small and large scale, as well as a large analysis of the influence of props using the effect size.

The effect size used is the effect size Cohen's d. Effect size Cohen's d usually records the amount of difference between two or more groups [15]. In this study using the average pretest and posttest. In the Effect size Cohen's criteria d plant reproduction props be said to have an effect if the value of the effect size obtained is > 0.5 and if the value is suppressed > 33.0%.

On the results of the analysis, it can be seen that the magnitude of the influence of plant reproduction props on the cognitive learning outcomes of the pretest and posttest of mentally retarded students is 4.6 which is included in the big criteria. Pretest data is the average cognitive value for the first 3 meetings, and the posttest data is the average cognitive value for the last 3 meetings. Pretest is considered good, this is because the first meeting has used plant reproduction props so that students' motivation is more motivated. This proves that plant reproduction props greatly influence the cognitive value of mentally retarded students.

4. Conclusion

Based on the results and discussion that has been described, it can be concluded that learning using plant reproduction props can increase learning motivation and communication skills of mentally retarded students at SLB widya bhakti semarang. This is seen from the increase in communication skills and student learning motivation from the observer sheet at the first meeting with the sixth meeting. Plant reproduction props were declared valid by 5 experts including 4 UNNES Science lecturers who were experts in their fields and 1 class teacher who deeply understood the abilities and shortcomings of students. The results of the analysis use the effect size stating the influence of plant reproduction props on learning outcomes and the ability of students, especially communication skills and student motivation. Based on the results of observations and research that have been carried out, the advice that can be given is that plant reproduction props is still not waterproof and easy to tear, so it is expected to be more careful in using it.

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