



JURNAL ASESMEN DAN INTERVENSI ANAK BERKEBUTUHAN KHUSUS

Jurnal homepage: <https://ejournal.upi.edu/index.php/jassi/index>



Improvement Hydroponic Cultivation Skills through The Demonstration Method in Student with Intellectual Disabilities

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ABSTRACTS

The purpose of this study was to determine the improvement of hydroponic plant cultivation skills in students with mild special needs in Schools with special needs-C Education Foundation for Special Needs Asih Manunggal Asih Manunggal Bandung through demonstration method. The type of research used is Classroom Action Research with 3 students with mild special needs as the subject. Data analysis techniques were carried out quantitatively and descriptively qualitatively. The results showed that there was a change in student scores with a significant increase in ability in hydroponic cultivation skills from each cycle of actions in learning that met the minimum completeness criteria, namely a score of 70 in skills lessons after students received hydroponic plant cultivation learning through the demonstration method. This success is because the demonstration method is very effectively used in learning hydroponic skills, where students can understand the real or imitation in a process or the workings of an object related to the lesson material. The demonstration method can be considered by teachers to be used in the skills learning process, especially hydroponic plant cultivation skills for mentally retarded students and can be developed for learning other materials.

ARTICLE INFO

Article History:

Received 28 Jan 2022

Revised 03 Feb 2022

Accepted 14 Feb 2022

Available online 26 Feb 2022

Keyword:

Demonstration method,
Hydroponic cultivation skills,
Student with intellectual
disabilities.

1. INTRODUCTION

Skills education is an optional program that can be given to mentally retarded children, directed at mastering one or more types of skills so that it can be a provision for their lives in society. Hydroponic learning in schools is one option to equip children with mild mental retardation in facing increasingly fierce business competition and fostering independence in entrepreneurship (Kwon & Lee, 2016). Where this hydroponic learning has many advantages for mentally retarded children, namely: environmentally friendly, inexpensive, not harmful and does not consume land according to the condition of the school yard which is not so wide, but can take advantage of existing land and can produce. Even the way of doing it is not so difficult because it is adjusted to the limited ability of mentally retarded children as a provision so that they have a skill that can equip them to be able to live properly in the midst of society. In order to realize this hydroponic learning, it is necessary to support an effective and efficient method so that the hydroponic learning process gets optimal results. The method is a way that is systematic which is used to achieve the goal.

This systematic is a concrete form of the application of general instructions for teaching in a particular teaching process (Schroeder *et al.*, 2010). The method that is used adhered on a subject of discussion that will be delivered. The method used must be in accordance with the subject matter, so that the purpose of using the method can be achieved. By looking at and considering several learning methods, the author chooses a method that is in accordance with the hydroponic learning that the author will apply to students. In this case I took a demonstration method, where the method of demonstration is a show about the occurrence of an event or object to the behavior exemplified appearance in order to be known and understood by the participant students in a real or replica.

Mental retardation is someone who has a below average level of ability and has limitations in academic ability but can still be given vocational skills to meet their needs (Slade, 2010). To be able to meet the needs of these mentally retarded children, it is necessary to have a skills education in entrepreneurship that is adapted to their limited abilities as a provision for them to be able to live properly in the midst of a post-school community. Theoretically, mentally retarded children are children who have intellectual abilities below the average, namely IQ less than 70, experience obstacles in physical, mental development, and social adjustment to their environment that occur during development. Intellectual limitations and potentials of mentally retarded children make them less able to meet their own needs, lack the skills to work adequately, but with good and continuous training and habituation, they are able to carry out daily life activities. The reality on the ground is that education for mentally retarded children in general has not led to the mastery of a number of skills and skills so that they can live independently in their environment after they graduate from school. They are also less able to socialize with their environment, less able to work or create work. Basically, they lack the necessary life skills to be able to live independently. For this reason, it is necessary to develop an educational model that leads to the achievement of life skills. The purpose of skills education for children with mild mental retardation is to develop skills and adapt them to a job. From the statement above, it can be concluded that skill education for mild mentally retarded children is to develop their potential according to their talents and interests as a basic attitude to do a job in the community so that they can earn income for themselves and the surrounding community.

Currently, there are many studies that discuss hydroponic plant cultivation or skills. From the results of previous research searches, several problems related to the problem to be studied were obtained, namely:

Triwijayanti et al. (2019) (Effectiveness of the Project Method in Improving the Wick System Hydroponic Mustard Planting Skills for Mild Mentally Impaired Children in Class IX SLB Luki Padang. *Journal of Special Needs Education* Volume III Number I Year 2019 ISSN:Print 2598-5183-Online 2598-5183.

Planting Training with a Hydroponic System for Mild Mentally Impaired Teens Through the Peer Tutor Process. (2019). *CARADDE: Journal of Community Service*, 2(1), 67-73. <https://doi.org/10.31960/caradde.v2i1.229>.

Improving skills in growing turmeric through demonstration methods in mild mentally retarded children Bayu Perdana Aryaand1, Fatmawati2, Indonesia, *Special Needs Education Research Journal* Volume 7 Number I Year 2019 ISSN: Online 2622-5077.

However, until now there has been no research that discusses improving hydroponic plant cultivation skills through demonstration methods for students with mild mental retardation.

This study aims to improve hydroponic cultivation skills for student with student with intellectual disabilities special needs education foundation Asih Manunggal of Bandung City through the demonstration method.

2. METHODS

2.1. Research subject and place

The research subjects taken were student with student with intellectual disabilities special needs education foundation Asih Manunggal of Bandung City, totaling three male students. With student data in the following **Table 1**.

Table 1. Student list.

No	Student's name	Age	Class
1	FM	16 years	X
2	M N	18 years	X
3	RP	18 ears	X

2.2. Research Procedure

This study focuses on improving the learning of hydroponic plant cultivation skills through demonstration methods for students with mild mental retardation. The method used in this research is classroom action research (*Classroom Action Research*, researchers conduct research when learning by observing the ongoing teaching and learning process of hydroponic skills in the researcher's class, namely class X Middle School with Mild Special Needs.

Figure 1 explains the procedure for the flow of classroom action research using the model that implementation of Classroom Action Research is not only done once but requires a process of at least two cycles each the cycle must go through four stages known as Planning (Preparation), Action (Action), Observation (Observation), with Reflection (Reflection). The flow of the action research cycle is as follows.

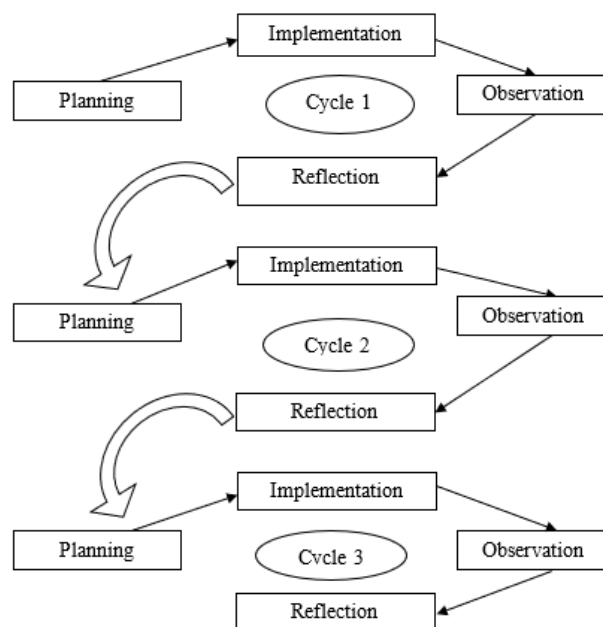


Figure 1. Classroom action research flow.

2.3. Activity procedure

In this classroom action research, the researcher uses three cycles, each cycle consisting of four stages, including the implementation of one action per cycle. The following steps are carried out in this classroom action research:

2.3.1. Action planning stage

The stages of action planning are as follows:

- (i) Determine the object (problem) to be studied. This research begins with the problem that students with mild mental retardation have difficulty and are not interested in learning hydroponic plant cultivation skills at first because they are still foreign, especially children find it difficult to start, process and finish in learning hydroponic plant cultivation skills.
- (ii) Determining and reviewing research subject data. The data of the research subjects were students with mild mental retardation, with a total of 3 students.
- (iii) The implementation of this classroom action research was carried out by the researcher himself, in other words, the researcher besides being an observer also took action on the grounds that the researcher was a classroom teacher. In action research the teacher will ask questions about the learning practices they do themselves, evaluate them, research them and develop them, even change them honestly and wisely.
- (iv) Prepare the design of learning materials/materials, the design of hydroponic skills learning which includes the determination of teaching techniques, as well as technical and observation/evaluation instruments such as evaluation instruments consisting of pre-test, post-test and process questions with observation guidelines, both oral, written and deed. The lesson plan is listed in full in the Vocational Skills RPP.

2.3.2. Action implementation stage

This stage is the implementation (implementation) of all the plans that have been made. The implementation of classroom action in this study begins with an assessment of student data as research subjects consisting of three people.

The essence of the implementation of this research action is the process of learning the skills of hydroponic plant cultivation which is carried out effectively.

- (i) Cycle I, carried out one learning meeting using the RPP Skills for hydroponic plant cultivation skills through the demonstration method with maximum assistance.
- (ii) Cycle II, held one learning meeting using the same lesson plans to improve hydroponic plant cultivation skills through a demonstration method with minimal assistance.
- (iii) Cycle III, carried out in one learning meeting using the same lesson plan, learning hydroponic plant cultivation by further improving hydroponic skills learning achievement through a demonstration method where students practice directly independently.

2.3.3. Observation stage

Observations (observations) by researchers are carried out simultaneously with carrying out actions, meaning that when the researcher or teacher provides action/learning, at that time the researcher observes the action process.

Observations were made in each cycle to see the process of learning hydroponic skills and to collect research data using observation guidelines by adding anecdotal notes to books to complete data collection.

2.3.4. Reflection stage

The results of the research obtained from the observation stage in each cycle were then collected and analyzed together through discussions with the teacher and the research team, to find out whether the action activities that have been carried out are in accordance with the objectives or not so that they can be used as material for making further action decisions.

Figure 2 describes the procedure for classroom action research activities consisting of the stages of planning, implementing, observing and reflecting.



Figure 2. Procedure for classroom action research activities.

2.4. Research instruments

To obtain objective truth, it is necessary to collect data, so that the problem to be studied can be properly reflected. The data collection techniques used are through:

2.4.1. Data source

The data sources of this study were mild mentally retarded students of class X SMALB-C at SLB-C YPLB Asih Manunggal, Bandung City.

2.4.2. Data type

The type of data obtained is quantitative data consisting of data: pretest results, exercise results and post test results.

2.4.3. Data collection technique

Data collection techniques used are observation and action tests. The process of collecting data in research, researchers or observers see the research situation. The type of observation used in this research is structured observation (with guidelines). Observations

made in this classroom action research are observing student activities in learning activities of hydroponic plant cultivation skills by using the demonstration method for mild mental retardation. The format used for observation activities is as following **Table 2**.

Table 2. Observation guidelines, improving hydroponic plant cultivation skills through demonstration methods for mild mentally impaired students.

No	Rated Aspect	Student Ability			Description
		Capable	Able with help	Not capable	
1	Mention tools and materials for hydroponic plant cultivation				
2	Mention the types of hydroponic plants				
3	Prepare tools and materials for hydroponic plant cultivation				
4	Demonstrate cutting Rockwool (planting media such as foam/sponge)				
5	Demonstrate arranging Rockwool (planting media such as foam/sponge)				
6	Demonstrate wetting Rockwool (planting media such as foam/sponge) with water				
7	Demonstrate planting seeds on Rockwool as seedlings				
8	Store plant nurseries in a safe place				
9	Transferring plant seeds to a netpot as a container for inserting rockwool				
10	Demonstrate mixing nutrient A and nutrient B as a hydroponic plant fertilizer				
11	Demonstrating harvesting hydroponic crops				
	Total acquisition score				
	Maximum score				
	Score				
	Ability Level				

Assessment criteria:

Score 3: able without help

Score 2: able with help

Score 1: unable

Ability Level Percentage Value:

$$\frac{\text{value acquisition} \times 100\%}{\text{max score}}$$

To fill in the observation guidelines above, use an assessment score with a range from 1 to 3, as shown in **Table 3** below.

Table 3. Rating score.

Criteria	Score
Able without help	3
Able with help	2
Not capable	1

Information:

(i) To determine the value used the following formula:

The score obtained x 10 = value

Ideal Score

The ideal score for the observation guide is 33 (3 x 11)

(highest score x number of questions)

(ii) To determine the percentage increase in hydroponic plant cultivation skills through the demonstration method:

Score obtained x 100%

Ideal Score

The Ideal score for the percentage increase in hydroponic plant cultivation skills through the demonstration method is 100

(iii) Criteria for improving hydroponic plant cultivation skills through demonstration methods:

80 % - 100 % : Very good

68 % - 79 % : Well

56% - 67% : Enough

45% - 55% : Not enough

0 % - 44% : Not much

3. RESULTS AND DISCUSSION

3.1. Student demographics

Table 4 describes the data on the state of the research subject in terms of physical, emotional, social, language, and cognitive abilities. American Association of Mentally Deficiency (AAMD) and PP No. 72 of 1991 (in Mohammad Amin, 1995:22), mild mentally retarded children are children who have an IQ between 50-70 so that they experience obstacles both in intelligence and social adaptation, but they have the ability to develop in the fields of academic lessons, social adjustment, social skills work".

Table 4. Conditions of students.

No	Student	Age	Student's state	Information
1	FM	16	From a physical point of view, the subject has an ideal height of 165 cm, thin and tall. The emotional aspect of the subject shows a happy attitude when his wishes are obeyed and gets angry quickly. The social side likes to shout without reason, indifferent to others, doing something if he wants to (mood). In terms of language and communication are quite good, then in terms of cognitive can read, write and count simply, mention the names of objects in the classroom can mention the names of friends in class. Can say the names of teachers, distinguish between male and female.	

Table 4 (continue). Conditions of students.

No	Student	Age	Student's state	Information
2	M N	18	From a physical point of view, the subject has a height of 166cm. the emotional aspect likes to get angry suddenly, shows a happy attitude when his wishes are obeyed, sheds tear suddenly. In terms of socially quiet and withdrawn, not interested in being with friends, prefers to be alone, indifferent to others. In terms of language and communication is not good, then the cognitive abilities of the subject can write if they want (mood) by imitating, mentioning some names of objects, mentioning their names, sometimes the words used do not match their meaning.	
3	RP	18	From a physical point of view, the subject has a height of 164cm, a thin white body, has physical limitations with small feet but does not interfere with mobility. From an emotional point of view, they have a passion for learning, they are offended when they talk about their inability. Laugh when you hear something funny, friendly like to say hello. Good at socializing, likes to ask questions, then from a cognitive perspective can read, write and count in a simple way. Mention the names of objects in the classroom can mention the names of their friends in class, can mention the names of teachers, distinguish between boys and girls.	

3.2. Learning process activities

In accordance with the hydroponic learning scenario that has been prepared previously (planning stage). Action plans are made in the form of flexible learning scenarios so that they can assist teachers in implementing more effective and efficient learning.

In the activity of the learning process, the researcher conducted a study on hydroponic plant cultivation starting from the initial activities, core activities and final activities. The learning activity begins by saying greetings, conditioning students in learning activities, saying hello then reading prayers, reading Asmaul Husna and singing the national anthem Indonesia Raya, then doing apperception by asking students "who knows what hydroponic plants are?".

Furthermore, in the core activity the teacher conveys learning material with learning steps, namely: The teacher gives an explanation of the meaning of hydroponics, students listen to the teacher's explanation about the meaning of hydroponics, students mention the types of hydroponic plants, students mention tools and materials for hydroponic cultivation, the teacher shows tools and materials hydroponic plants, students prepare tools and materials for hydroponic plant cultivation, students prepare hydroponic plant nurseries, the teacher explains the hydroponic plant cultivation process, students cut rockwool as a plant medium, students wet rockwool as a plant medium, students cut rockwool as a plant

medium, students plant seeds on rockwool as seed, students mix nutrient a and nutrient b as fertilizer for hydroponic plants and so on until students are able to work independently.

The next stage is the final activity by carrying out a learning evaluation). The evaluation was carried out to determine the extent to which hydroponic cultivation skills were improved through the demonstration method for mild mentally retarded students. Then the teacher together with the students conclude the learning outcomes. Furthermore, students get assignments to do at home related to hydroponic plant cultivation skills and close the lesson and pray with students to end the lesson. Learning activities are carried out with the aim of training students' motor skills, training attitudes, fostering expression on hydroponic skills, fostering creativity in hydroponic crafts, fostering sensitivity through hydroponic skills. The method used is the method of question and answer, assignment, and demonstration. Learning media are: Rockwool, nepot, nutrition A and nutrition B, water, tub. Then Learning resources: 2006 Curriculum, 2013 Curriculum, Books on hydroponic plant cultivation and the Internet.

3.3. Pretest post test results or learning outcomes

Table 5 describes the level of students' abilities in improving hydroponic plant cultivation skills through the demonstration method for mild mentally retarded students carried out in cycle I. **Table 6** describes the level of students' abilities in improving hydroponic plant cultivation skills through the demonstration method for mild mentally retarded students carried out in cycle II. **Table 7** describes the level of students' abilities in improving hydroponic plant cultivation skills through the demonstration method for mild mentally retarded students carried out in cycle III.

Table 5. The level of students' abilities in improving hydroponic plant cultivation skills through demonstration methods for mild mentally retarded students.

Cycle I			
No.	Subject	Score	Ability Level (%)
1	FM	6.06	60.6
2	M N	4.54	45.4
3	RP	6.36	63.6
Average		5.65	56.5

Table 6. The level of students' abilities in improving hydroponic plant cultivation skills through demonstration methods for mild mentally retarded students.

Cycle II			
No.	Subject	Score	Ability Level (%)
1	FM	8.48	84.8
2	M N	6.06	60.6
3	RP	8.78	87.8
Average		7.77	77.7

Table 7. The level of students' abilities in improving hydroponic plant cultivation skills through demonstration methods for mild mentally retarded students.

Cycle III			
No.	Subject	Score	Ability Level (%)
1	FM	9.39	93.9
2	M N	7.27	72.7
3	RP	9.69	96.9
Average		8.78	87.8

3.4. Analysis of research activity results

Based on the data then analyzed the average level of students' ability in improving hydroponic plant cultivation skills through the demonstration method on mild mentally retarded students carried out in cycle I showed an average number of 56.5%, which means this result has sufficient criteria and does not meet the criteria for completeness. at least 70 of the mild mentally retarded vocational skills lessons at SLB-C YPLB Asih Manunggal Bandung City. the value obtained by FM is 6.06 with a percentage of 60.6%, the value obtained by MN is 4.54 with a percentage of 45.4%, then RP gets a value of 6.36 with a percentage of 63.6. The data obtained through observations in the first cycle can be concluded that students still have learning achievements below the minimum completeness criteria in terms of hydroponic plant cultivation skills so that students' ability levels do not appear optimal and still need help and cannot do it independently.

Based on the data then analyzed the average level of students' ability in improving hydroponic plant cultivation skills through the demonstration method on mild mentally retarded students in class X High School with mild special needs at the special needs school for children with special needs, the Asih Manunggal Special Education Foundation, Bandung City cycle II showed an average number of 77.7% which This means that this result has good criteria and has met the minimum completeness criteria on the average class, but individually there is still one person who gets a score that is still below the minimum completeness criteria. The score obtained by FM is 8.48 with a percentage of 84.8%, MN gets a score of 6.06 with a percentage of 60.6, then RP gets a value of 8.78 with a percentage of 87.8. In the position of good criteria, it has been seen that there is an increase in hydroponic plant cultivation skills shown by students on average. With room conditions and continuing to motivate students in the practice of hydroponic plant cultivation, it is hoped that the third stage will be even more optimal. Learning is still continued in the next cycle because there is still one student who has not yet completed learning and meets the minimum completeness criteria in vocational skills lessons, especially in learning hydroponic plant cultivation skills. It is hoped that in the next cycle, the value and level of student ability can be obtained both on average in class and individually so as to achieve an increase in learning achievement and fulfill mastery in learning.

In general, the average percentage in the third cycle has very good criteria, namely 87.8%, and each student has obtained a score and level of ability to meet the minimum completeness criteria. The value obtained is 9.39 with a percentage of 93.9%, MN gets a value of 7.27 with a percentage of 72.7%, then RP gets a value of 9.69 with a percentage of 96.9%. The level of improvement can be clearly seen in Table 6, the increase in learning achievement of hydroponic skills through the demonstration method for mild mentally retarded students in class X High School with mild special needs at the special needs school for children with special needs, the Asih Manunggal Special Education Foundation, Bandung City.

Based on the data through observation guidelines, it can be concluded that in cycle III, students have more understanding in mastering hydroponic plant cultivation skills, which is indicated by an increase in the percentage obtained by students from the class average and each student has met the minimum completeness criteria of skills. hydroponic cultivation at SLB-C YPLB Asih Manunggal Bandung City and increased compared to the gains in cycles I and II so that mastery learning has been obtained well.

To further clarify the improvement of hydroponic cultivation skills through the demonstration method for mild mentally retarded students of class X High School with mild special needs at the special needs school for children with special needs, the Asih

Manunggal Special Education Foundation, Bandung City, it can be seen in the picture of the percentage comparison of students' ability levels in each cycle and the graph of the average percentage of students' ability levels each cycle.

Figure 3 describes a comparison of students' ability levels in improving hydroponic plant cultivation skills through the demonstration method for mild mentally retarded students in class X High School with mild special needs at the special needs school for children with special needs, the Asih Manunggal Special Education Foundation, Bandung City. **Figure 4** describes a overview of the Average Level of Students' Ability in improvement of hydroponic cultivation skills through demonstration methods for mild mentally retarded students in class X High School with mild special needs at the special needs school for children with special needs, the Asih Manunggal Special Education Foundation, Bandung city.

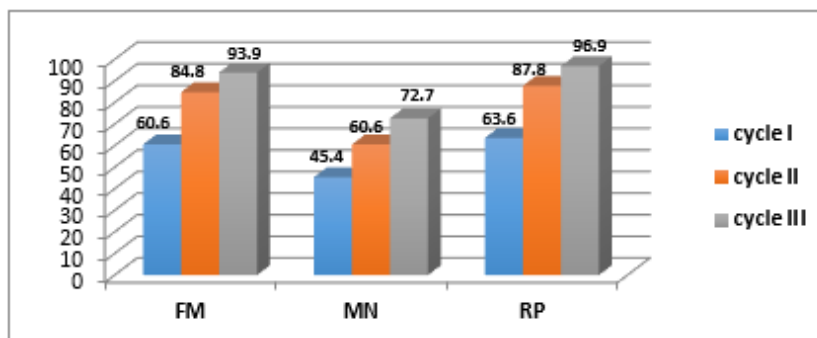


Figure 3. Comparative overview of students' ability levels in improvement of hydroponic cultivation skills through demonstration methods for mild mentally retarded students in class X High School with mild special needs at the special needs school for children with special needs, the Asih Manunggal Special Education Foundation, Bandung City.

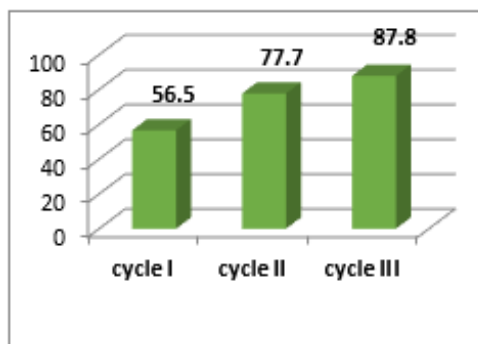


Figure 4 Overview of the Average Level of Students' Ability in improvement of hydroponic cultivation skills through demonstration methods for mild mentally retarded students in class X High School with mild special needs at the special needs school for children with special needs, the Asih Manunggal Special Education Foundation, Bandung City.

4. CONCLUSION

Based on the results of classroom action research in terms of improving hydroponic plant cultivation skills through the demonstration method for mild mentally retarded students in class X High School with mild special needs at the special needs school for children with special needs, the Asih Manunggal Special Education Foundation, Bandung City, it can be concluded as follows:

- (i) After the students took part in the learning of hydroponic plant cultivation skills through the demonstration method, they experienced an increase in self-development up to the class average ability level of 87.8%.
- (ii) With the demonstration method, students with mild mental retardation have an understanding or understanding of something that is being demonstrated and are more motivated to participate in learning hydroponic plant cultivation skills so that the level of students' abilities can increase to the maximum.
- (iii) The demonstration method in hydroponic skills lessons is more appropriate to use so that it is easier for children to practice work.

From all the data from the classroom action research above, it shows that increasing hydroponic plant cultivation skills through the demonstration method on mild mentally retarded students can achieve significant results and students gain valuable learning experiences so that the results obtained from learning hydroponic plant cultivation skills can be used as a provision for post-school entrepreneurship.

5. ACKNOWLEDGMENT

We acknowledge SLB-C Special Education Foundation Asih Manunggal Bandung City". and Special Services (PKLK). We also thank Wiwin Wiartini, S.Pd., MMPd. as Principal, Ida Yohaidah, S.Pd. MMPd. as teachers, colleagues and fellow teachers and the SLB-C community. YPLB Asih Manunggal We also acknowledged Deden Syaiful Hidayat, M.Pd. (Head of PKLK), Dr. Eng. Asep Bayu Dani Nandiyanto (Head of Office, KJP UPI), Dr. Yuyus Suherman (Head of Department, Department of Special Education, UPI), Rina Maryanti, M.Pd. (Assistant Professor, Department of Special Education, UPI), Muktiarni, M.Pd. (Assistant Professor, Department of Catering Education, UPI), Ahmad Bukhori Muslim (Director, Directorate of International Affairs, UPI), Nissa Nur Azizah, Dwi Fitria Al Husaeni, and Dwi Novia Al Husaeni. This program is also supported by the UPI Community Service and Community Service Program.

6. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

7. REFERENCES

- Kwon, J., and Lee, Y. (2016). Serious games for the job training of persons with developmental disabilities. *Computers and Education*, 95, 328-339.
- Schroeder, A., Minocha, S., and Schneider, C. (2010). The strengths, weaknesses, opportunities and threats of using social software in higher and further education teaching and learning. *Journal of Computer Assisted Learning*, 26(3), 159-174.
- Slade, M. (2010). Mental illness and well-being: the central importance of positive psychology and recovery approaches. *BMC Health Services Research*, 10(1), 1-14.
- Triwijayanti, V., Fatmawati, F., and Zulmiyetri, Z. (2019). The effectiveness of the project method in improving the wick system's hydroponic mustard planting skills for mild mentally impaired children in class IX SLB Luki Padang. *Journal of Special Needs Education*, 3(1), 37-42.