



The ability to learn how to process plastic waste becomes a paving block in tunagrahita (mild intellectual disability) students grade xii skh jiput mandiri

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Abstract

The limited intelligence development of Tunagrahita students results in limited academic learning ability, therefore education programs mainly in the SMALB category are directed more toward the mastery of vocational skills as a student's path to independence. The aim of this study is to find out the ability to process plastic waste to become a paving block in Tunagrahita students' grade XII at SKH Jiput Mandiri. To achieve that goal, researchers use descriptive methods with a qualitative approach. This data is obtained through observation, interview, documentation, and inductive analysis. Studies show that students in general can treat plastic waste as a paving block, but each student has a different ability. Students were struggling during the process of making paving block, especially in mixing the plastic waste in the heater. On top of that, they also still need assistance in stirring the plastic waste which has melted in paving block mold. The teacher's attempt to overcome the difficulty was to modify a deep-fried ladle made of bamboo, the teacher always joined in setting the fire under the fireplace used when tossing plastic waste into a paving block heater, the teacher provided the child's hand to safety washclothes when handling a

paving block printer and also the teacher provided a small wood to pour melted plastic waste into the paving block mold. It is recommended to the principal of the school to facilitate adequate facilities and infrastructure as well as mobilizing teachers' skill to be more creative in planning skill programs.

Keywords

ability, mixing plastic waste into paving block, mild tunagrahita

Introduction

Children in groups that have two standard deviations of intelligence below the average child in general, both social development and intelligence are called intellectual disability children; The official term in Indonesia is called the tunagrahita child (72 year 1991 pp). Tunagrahita children are part of special needs children. According to the American association on mental deficiency (AAMD) formulated by grossman (1983) in Hallahan and Kauffman, (1982:40) the understanding of tunagrahita children is as follows: "Mental retardation refers to significantly sub average general intellectual functioning existing concurrently with deficits adaptive behavior and manifested during the development period". The tunagrahita refers to the general public intellectual functions that are below average along with deficiencies in behavioral adaptation and progress periods.

Tunagrahita students have academic limitations, but they still have the potential to develop in other fields, one in vocational learning. A mild disabled student needs to be equipped with vocational skills to complete his or her education as a basis for life support in the community. Nilacakra (2021:9) suggests that "Vocational education is a process of teaching, mentoring as well as training one follows to become skilled in a particular line of work or endeavor."

Thompson (1973) and Mastiani (2021:9) define vocational school as "An adequate vocational school is an educational program that seeks to give experience, visual stimulus, effective awareness or attitude, cognitive information, or psychomotor skills to the learner, and enhances the process from the exploration, securing and maintenance of a career that matches the vocational development of a person to enter or while in the workforce."

One of the vocational learning given to tunagrahita students is learning how to process plastic waste into paving blocks which is the programs in SKH Jiput Mandiri. The purpose of this practice is to train tunagrahita students to have basic skills to work or even produce their products after graduating from school.

Based on a preliminary study of researchers at SKH Jiput Mandiri, this program has been running for seven years. As researchers carry out the observations, researchers observe tunagrahita students processing plastic waste into paving blocks.

According to the problems found in the field, researchers are interested in researching the ability to learn how to process plastic waste into paving blocks on tunagrahita students xii at SKH Jiput Mandiri.

Early studies by Weni (2021) in the village of Lembeyan regarding making paving block in an effort to reduce inorganic waste. The results of the study indicate that this activity receives good animos from communities because outnumber plastic waste is having a negative impact on the environment. These paving blocks are rated quite easily based on plastic waste and a few other used materials. The hexagon wood paneling, wooden mixer, and hexagon paving paving prints are followed not only by university students but also by a significant number of local residents.

Literature review

Concept of Tunagrahita

Definition

The tunagrahita students are those whose intelligence clearly is below average. In addition, they are able to adapt to the environment very slowly. They were poorly equipped with abstract, problematic, and deviant thoughts.

Clasification

Mild Tunagrahita

A mild tunagrahita has an IQ between 68-52 based on binet scale. Whereas Weschler (WISC) points out that mild tunagrahita children fall into the category between 69-55.

Moderate Tunagrahita

This group has an IQ of 51-36 according to the Binet Scale and 54-40 according to the Weschler Scale (WISC).

Severe Tunagrahita

Severe tunagrahita have an IQ between 32-20 according to the Binet Scale and between 39-25 according to the Weschler Scale (WISC).

Profound Tunagrahita

Has an IQ under 19 by the binet scale and an IQ under 24 by the Weschler scale (WISC). A maximum mental or MA ability that can be achieved in less than three years or four years.

Mild Tunagrahita

Definition

Mild tunagrahita students are the most highly intellectual group of people compared with the rest of the disabled. Although their intelligence and social

adaptation are impaired, they have the ability to develop in academic subjects, social adjustments, and work ability. (Mastiani, 2018) as they expect (2006:106) that " Mild tunagrahira students are milder subjective individuals than ordinary disabled groups. Their intelligence according to the binnet scale ranges between 68-52, whereas Weschler (WISC) has an IQ of 69-55." While Amin and Suhaeri (1980) quoted by Mastiani (2018:11) argue that "The development of mild tunagrahita intelligence is about half and three quarters than the speed and development of normal children. It is also applicable to their ability in taking up the lessons at school." It has been proven that at an adult age, the child's intelligence of mild tunagrahita is at about the same rate as normal children between the ages of 9 and 12. (Emay mastiani 2018:12). From this statement, mild grahita students have preferably mildly impaired intelligent IQ scores between 50-70. However, optimum development will be achieved if they receive intensive education services with personalized programs and methods.

Characteristics

Characteristics of tunagrahita according to the Amen (1984) quoted by Mastiani (2018:12) as follows:

Mental characteristics

They show the tendency to respond by replying to different questions, not being able to keep complicated instructions in their mind or remembering them, but having more practical thinking ability than abstract.

Physical characteristics

They have devoid physical abnormalities since they fall into mild intellectual disability category.

Social and emotional characteristics

Their interests and recreation are better suited to the same mental age as their chronological age. They mostly have problems with their behavior and tend to be more mischievous than the normal ones.

Academic characteristics

Their abilities are impaired and slow for those who can still be given academic subjects (reading, writing, and arithmetic).

Occupation characteristics

Tunagrahita students who could work are the ones who are mild and mature adults under the category "skill" and "semi-skill" works.

According to those descriptions, tunagrahita students are children whose physical condition is no different from that of normal children. However, in terms of intelligence, social and emotional intelligence are considerably different, such as their thinking ability is limited, easily frustrated, short attention, and so on.

The Obstacles of Tunagrahita Students

Mildly tunagrahita students have diverse problems like learning difficulties, especially in the academic field. But in the non-academic field, they didn't seem to be in trouble. The learning obstacles for mild tunagrahita are difficulty to grasp lessons, difficulty in conducting the learning process, and poor memory.

The Learning Needs

The learning needs of mild tunagrahita is stated by Astaty and Mulyati (2010:25) as follows;

The need for learning services

Potential in learning is closely related to the severity of mental retardation. Special needs in learning services are:

1. The need for teaching services is the same as other students.
2. The need for very special learning services they require services, such as: stimulation programs and early intervention.
3. The need for the creation of a learning environment
4. The need for the development of self-development abilities
5. The need for the development of social and emotional abilities
6. The need for skill development

These are some tunagrahita advantages which will bring them into relationships with others, including: (a) a natural and positive spontaneity, (b) the tendency to respond kindly and warmly to others, (c) the tendency to respond to others honestly, and (d) the tendency to trust others.

In line with the above statement, it is very clear that tunagrahita students also have needs that must be addressed among them academic, learning environment, social, and skill needs. Therefore, parents, teachers, and the environment should provide support to keep their progress intact and not feel excluded because it will affect their social and emotional development.

Waste Management

Definition of waste

Waste is something that is no longer used and will become trash so it must be managed as well as possible in such a way as not to cause negative things to life. For example plastic waste, rubber, paper, iron, copper, aluminum. Through the

recycling process, waste will change form and function to become a final product that can be reused. In waste management, recycling efforts will work well if segregation and separation of waste components is carried out from the source to the final process. The main objective in the basic plastic recycling process is to process plastic waste into plastic pellets or ore which are the basic ingredients for forming plastic according to the desired product. In this process, the type of raw material used determines the type of plastic ore produced. Good quality recycled raw materials are plastics that have never been recycled before or have only been recycled once.

Types of waste

According to Alex's explanation (2015) the types of waste as follows

1. Natural waste - waste produced in outdoor life and integrated through a natural recycling process, like dry leaves in a forest that decomposes into soil.
2. Human waste: the results of human pollution, such as faeces and urine.
3. Household waste from activities, the waste produced by most households is paper and plastic.
4. Consumption waste is waste generated by humans from using goods such as food skins and food scraps.
5. Office waste: waste originating from office environments and shopping centers such as organic waste, paper, textiles, plastics and metals.
6. Industrial waste: waste originating from industrial areas consisting of general waste and liquid or solid hazardous waste.

Based on types

1. Organic waste is food waste, such as meat, fruit, vegetables, etc.
2. Inorganic waste remains of synthetic materials such as plastic, metal, glass, ceramics, etc.

Based on its shape, solid waste is all waste materials other than urine and liquid waste. It can be from kitchen waste, garden waste, plastic, metal, glass, and others. These could be grouped into organic waste and inorganic waste.

Recycling plastic waste into paving blocks

Plastic waste is a type of inorganic waste that is difficult to decompose. It causes plastic waste to become a severe environmental problem (Armus, et al., 2022: 102). Immediate disposed plastic waste without being recycled can cause various environmental problems such as causing soil damage since waste does not decompose and covers the soil surface, causing siltation and clogging river water flow as well as polluting sea waters. Recycling and utilizing plastic waste into products is critical.

One of the potentially profitable plastic waste recycling in the future is by recycling plastic into paving blocks. The materials needed in making this paving block include plastic waste, preferably plastic bags (the time to melt them is shorter than other plastic waste), husk ash, and used oil.

Research methodology

The method used by researchers is a qualitative descriptive method, which is a method to describe conditions that are happening and are still ongoing at the moment in the field. It still in line with the opinion of Afifudin (2012: 43) that: "Descriptive method is research that aims only to describe the state of the object or event without intending to draw general conclusions". Through this method the researcher examine the problems exist in the field related to the ability to process plastic waste into paving blocks in class XII mildly tunagrahita students at SKH Jiput Mandiri. Data was obtained through observation techniques, interviews, and documentation. Qualitative research is focused on the process, therefore several stages are carried out including: preliminary studies to determine the problems that will be used as research material, collecting various information through theoretical studies, observing students and interviewing teachers, and collecting various documents in accordance with research interests . These findings are then analyzed as preliminary data.

Research finding

The ability of mildly tunagrahita students to learn processinf plastic waste becomes paving block

Mild tunagrahita students' ability to learn processing waste becomes a paving block from preparation, process, to the end of the activation process. The preparation of the device is a paving block heater, gigantic spoon, fireplace, paving block printer, matches, scales, and bucket. The materials used were water, plastic trash, firewood

The process of making Paving blocks consists of several stages as follows;

1. Sorting plastic waste used to make paving blocks
2. Burning wood fire under the stove
3. Heat the paving block heater
4. Weighing 3 kg of plastic waste
5. Put the plastic into the heated paving block heater
6. Stir the plastic waste that has been put into the heater until it melts using silk
7. Pour the melted plastic waste into the paving block molds using a sutil
8. Wait for the contents of the paving block mold to cool for 2 hours
9. Remove the finished paving block mold from the mold by immersing it in a bucket filled with water for 10 minutes
10. Arrange ready-made paving blocks in the space provided

In this activity, mild tunagahita students at SKHJiput Mandiri could recognize the tools and their uses. In addition, they are capable preparing tools and materials and can follow the manufacturing process of processing plastic waste into paving blocks. In learning to process plastic waste into paving blocks, the ability of mild tunagrahita students at SKH Jiput Mandiri is different, it can be seen in the process of making paving blocks, some immediately understand the manufacturing process, and some still need the teacher's assistance.

Difficulties faced by mild tunagrahita students in learning to process plastic waste into paving blocks

Processing plastic waste into paving blocks requires precision and caution because it is associated with the danger of fire or heat. Adequate preparation is necessary, especially safety equipment to prevent from unnecessary danger. Based on the observations, students experience challenges in mixing plastic waste from paving block heaters. As a result, students were still assisted by the teachers. On top of that, they also had difficulty pouring melted plastic waste into the paving block molds.

The atmosphere when learning to process plastic waste into paving blocks

Processing plastic waste into paving blocks conducted in a conducive atmosphere where children showed happy and enthusiastic attitude. Supports and safety environment were also provided. The process of making paving blocks is carried out outside the classroom. This is inseparable from the role of the teacher in motivating students to study seriously.

Teachers are creative in teaching by praising and giving encouragement to students. So they feel their work is valued and useful. The teacher also always gives directions to students in every process of making paving blocks, for example when sorting plastic waste, weighing plastic waste, lighting a fire under the stove, directing students during activities to stir melted plastic waste so it doesn't harm them.

The teacher's efforts to overcome children's difficulties when processing plastic waste into paving blocks

1. The teacher's efforts to overcome students' difficulties when mixing plastic waste in paving block heaters are as follows:
2. The teacher modified a silk spoon in the form of long tongs made of bamboo.
3. The teacher always takes part in setting up the fire under the stove used when mixing plastic waste

4. The teacher's efforts to overcome students' difficulties when pouring melted plastic waste into paving block molds are as follows:
 5. The teacher provides a washcloth as a mat so that the students' hands are safe when holding the paving block printer when pouring plastic waste
 6. The teacher provides a small stick to pour the melted plastic waste into the paving block molds
- The teacher's role and creativity are needed so that students feel comfortable and safe during the activity.

Conclusion, implication, and recommendations

Conclusion

Vocational skills learning is crucial and needed by mild tunagrahita students to equip them towards independence according to the abilities and needs of the environment in which the students live. In general, the results of this study concluded that mild tunagrahita students in grade XII at SKH Jiput Mandiri can process waste into paving blocks. Although in some cases, they still need the teacher's attention and assistance.

In particular, the results of this study concluded as follows:

1. The twelfth-grade of mild tunagrahita students at SKH Jiput Mandiri recognize tools and their uses. In addition, they are capable of preparing tools and materials. They also could follow the manufacturing process of processing plastic waste into paving blocks. In this process, the abilities of mild tunagrahita students at SKH Jiput Mandiri are different, some immediately understand the manufacturing process while some still need teacher assistance.
2. The mild tunagrahita students have difficulty mixing plastic waste in the paving block heater because the fire is on. In addition, they were struggling to pour melted plastic waste into paving block molds because of the smoke from plastic waste and very hot silk tools.
3. The learning process runs smoothly in a pleasant atmosphere where students look enthusiastic about participating in each stage of processing waste into paving blocks.
4. The teacher's efforts to overcome the difficulties faced by students when processing plastic waste into paving blocks
5. Modifying the sutil frying pan from bamboo in the shape of a tongs
6. Always participate in controlling the fire under the stove used when mixing plastic waste into the paving block heater
7. Provide a washcloth as a mat to protect students' hands when holding the paving block printer.
8. Provide small wood to pour melted plastic waste into paving block molds

Implication

The research results have implications for related parties as follows:

1. It is suggested that school should pay more attention to its environment and utilize various wastes that could process into profitable items.
2. Teachers can choose and adjust vocational skills learning materials by utilizing facilities which are suitable for mild tunagrahita students. In other words, teachers should be creative and innovative in selecting materials based on facilities, students' abilities, and the needs of the community environment so that it has economic value.
3. It is suggested for teachers to provide easily obtained, well-known and safe materials for mild tunagrahita students.
4. Parents and community can help procure raw materials in the form of waste in the home and community environment.

Recommendation

Based on the results, recommendations are made with the hope of becoming input and consideration to improve the quality of education services, especially in learning vocational skills for mild tunagrahita students

1. The school principal should try to complete the facilities and infrastructure needed during the learning process to obtain specific skills which is still in line with the school programs. This can be done in stages according to the funding support capacity of the school.
2. Teachers should be more creative in planning and implementing vocational skills learning programs for mild tunagrahita students in creating products and can be marketed in society
3. Community support is very important for the continuity of various vocational skills learning programs organized by schools. Therefore, community cooperation with schools is needed, especially in the procurement of raw materials and product marketing.

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