

# Implementation of Community Empowerment Program Based on Local Wisdom in Kulwaru Village

Hani Nurhasanah  
*Yogyakarta State University*  
 Yogyakarta, Indonesia  
 haninurhasanah.2017@student.uny.ac.id

Rochmat Wahab  
*Yogyakarta State University*  
 Yogyakarta, Indonesia  
 rochmat\_wb@uny.ac.id

**Abstract**— This study aims to describe the ability to understand science learning that occurs in autistic children in SLB N 1 Bantul. Qualitative descriptive research method. The subject of the study were two autistic students in the sixth grade of SLB Negeri 1 Bantul and an informant, namely the sixth grade teacher of the SLB Negeri 1 Bantul majoring in autism. Data collection techniques used are observation and interview. The results of the study can describe the understanding ability of autistic children in natural science learning, subjects have not been able to understand learning that is too difficult and apply the knowledge they have into daily life due to the low ability of understanding the science learning that the subject has.

**Keywords**— *program, community empowerment, local wisdom*

## I. INTRODUCTION

Learning is a modification or reinforcing behavior through experience. The experience is obtained in a process of interaction of individuals with their environment so as to obtain a new behavior change as a whole [1].

Natural Science (IPA) is a subject related to how to find out about nature and natural events in everyday life, so that in natural science education (IPA) it is not only mastery of a collection of knowledge in the form of facts, concepts only but it is also a process of discovery. By learning natural science education (IPA) can be a vehicle for students to learn themselves and the natural surroundings by developing further in the application of the daily life of the KTSP curriculum Depdiknas [2].

According to Hallahan, *et al.*, in [3] definition of autism "Autism means that a developmental disability is significantly verbal and nonverbal communication and social interaction communication and social interaction". This understanding can mean that autism is a significant developmental disorder in verbal and nonverbal communication and social interaction. Based on the above opinion, it is explained that children with autism experience significant obstacles in communication and interaction both verbally and nonverbally. Barriers to language development, communication and interaction result in the emergence of deviant behavior in children. This behavior arises as compensation for the loss of environmental stimulation that children get because they are unable to interact with other individuals. Criteria for autistic children used internationally

refer to the DSM-5, DSM-5 is the result of the development of DSM-IV-TR conducted in 2013.

Until now no exact cause of Autism disorder has been found. Previously said autism was a lifelong disorder, but now it turns out autism in childhood can be suppressed and reduced even though it cannot be one hundred percent eliminating the symptoms. This disorder occurs during pregnancy which can be caused by viral infections (Toxoplasma, CMV, Rubella, Herpes) and Fungus (Candida) so that it inhibits the growth of brain cells which causes the brain function of the baby being disrupted, especially the function of understanding, communication and interaction. Hence, me recent theory findings say that genetic factors (offspring) play an important role in the process of autism. Recent research has found an increase in psychiatric disorders of family members of autistic children in the form of an increase in the incidence of affective and anxiety disorders and also an increase in disturbances in social functions. In addition, there was also found a link between digestive disorders and autism. Most people with autism have not been able to digest protein from cow's milk (Casein) and wheat flour (gluten) perfectly. As a result there is a disturbance in brain function that will worsen cognitive function, attention and behavior.

According to Souders *et al.*, in [4]. That autism is a neurodevelopmental disorder in the category of pervasive developmental disorders, which are characterized by severe and pervasive damage in reciprocal socialization, qualitative interference in communication, and repetitive behavior. In line with this statement, Peeters in [5], suggests that autism is a developmental disorder, impaired understanding or pervasive disorder, and not a form of mental illness. Autistic children are very different from other children with special needs, they have complete senses, are able to hear, see, and feel but in a way that they find themselves, this is influenced by the brain that processes each information in different ways.

Autistic children are children who experience pervasive developmental disorders with marked disturbances in aspects of communication, behavior, language, emotions, social, and intelligence. Disorders in these six aspects are characteristic of autistic children, because in other types of pervasive disorders examples are asperger syndrome, Rett syndrome, Childhood disintegration disorder, and PDD-NOS there are only a few aspects experiencing interference. This shows that

autistic children are children who experience the most complex disorders compared to other types of pervasive disorders.

According to Sujarwanto, Sutadi, in [6] "Autism is a severe developmental disorder that affects the way a person communicates and socializes / relates to others". Autistic children generally experience complex developmental disorders which include language / communication disorders, behavior and social interaction. Symptoms of autistic disorders are usually found in children up to the age of three years. Disorders experienced by autistic children include aspects of behavior, social interaction, communication and language, as well as emotional disturbances and sensory perception even on the motor aspects. Disorders experienced by autistic children cause obstacles in the learning process of autistic children. Even so, they still have the potential to be trained to help and take care of themselves and some work that requires mechanical training.

From some of the opinions above it can be concluded that children with autism are children who experience social, emotional, and communicative interactions. The child has his own world, he doesn't care about his surroundings. Children also usually have emotional disturbances, children have not been able to control their emotions well, if he feels difficulties in learning or does not get anything he wants the child to be emotional, tantrum or hurt himself.

Based on the results of preliminary observations at SLB Negeri 1 Bantul, in terms of the ability to understand science learning for autistic children, the subject still had difficulty understanding the science learning material for class VI students about land, where the subject had to learn about the type of soil, soil structure, soil benefits, and land management. In the learning process, it is only based on the teacher's book and the practice directly invites children to the field for learning about soil material. Autistic children are very different from other children with special needs, they have complete senses, are able to hear, see, and feel but in a way that they find themselves, this is influenced by the brain that processes each information in different ways. Developments in medical science also detected that there were neurobiologist abnormalities in the central nervous system in the form of incomplete growth of brain nerve cells in some parts of the brain folds, which also affected the ability of understanding in autistic children.

So children can remember, but do not understand what is being conveyed because the material is quite difficult to understand. From this problem, researchers are interested in identifying the ability to understand science learning for autistic children in SLB Negeri 1 Bantul. This study aims to see the extent to which the ability to understand science learning in autistic children based on the age range of 10-11 years who entered the concrete operational phase in accordance with the concept of Piaget's theory, by Bybee and Sund in [7], on the cognitive development of normal children, which later teachers can use as the basis or reference in the provision of material and media for learning science that is more interesting and effective for children with autism in SLB Negeri 1 Bantul.

The rest of this paper is organized as follow: Section II describes the literature review. Section III describes the

proposed methodology. Section IV presents the obtained results and following by discussion. Finally, Section V concludes this work and highlights suggestion.

## II. LITERATURE REVIEW

According to Piaget in [8], cognitive development has four aspects, namely (1) maturity, as a result of the development of the nervous system; (2) experience, namely the reciprocal relationship between organism and its world; (3) social interaction, namely the effects obtained in relation to the social environment, and (4) equilibration, namely the ability or system to regulate within the organism so that he always maintains balance and adaptation to his environment.

### a) *Maturity*

Nervous system maturity is important because it allows children to get maximum benefit from physical experience. Maturity opens up possibilities for development while if it is lacking it will broadly limit cognitive achievement. Development takes place at different speeds depending on the nature of contact with the environment and the learning activities themselves.

### b) *Experience*

The interaction between the individual and the outside world is a new source of knowledge, but contact with the physical world is not enough to develop knowledge unless individual intelligence can utilize the experience.

### c) *Social interaction*

The social environment includes the role of language and education, physical experience can stimulate or inhibit the development of cognitive structures.

### d) *Equilibration*

The process of self-regulation and self-correction (equilibration), regulates the specific interactions of individuals with the environment and physical experience, social experience and physical development that causes cognitive development to run in an integrated and well-organized manner.

In Piaget's view, children actively build their cognitive world by using schemes to explain things they experience. Scheme is a cognitive structure used by humans to adapt themselves to the environment and organize this environment intellectually. Piaget in [8] said that there are two processes responsible for someone using and adapting their scheme:

### a) *Assimilation*

Assimilation is the process of adding new information to an existing scheme. This process is subjective, because someone will tend to modify the experience or information obtained in order to get into the pre-existing scheme.

### b) *Accommodation*

Accommodation is another form of adjustment that involves changing or replacing the scheme due to new information that is not in accordance with the existing scheme. In this process, a new scheme can also occur at all. Piaget divides children's cognitive development into 4 main periods that are correlated with and increasingly sophisticated as they age:

*c) Sensorimotor period (age 0–2 years).*

For children who are at this stage, experience is obtained through physical (limb movements) and sensory (sensory tool coordination). At first the experience was united with him, this meant that an object existed when it was in his vision. The next development he began trying to find the object that was originally seen and then hangs from his view, as long as the movement is visible. At the end of this stage he starts looking for objects that are lost if the object is not seen moving. Objects begin to separate from themselves and at the same time the concept of objects in their cognitive structure begins to mature. He began to be able to catapult physical objects into symbols, for example starting to speak imitating the sound of vehicles, animal sounds, etc.

*d) Preoperational period (age 2-7 years)*

This stage is the preparation stage for organizing concrete operations. At this stage the child's thinking is based more on concrete experience than logical thinking, so if he sees objects that look different, then he says it differently. At this stage, the child is still in the pre-operational stage, not yet understanding the concept of conservation (conservation), which is longevity, material immortality, broadness, etc. Apart from that, the characteristics of children at this stage do not understand and have not been able to think of two or more aspects simultaneously.

*e) Concrete operational periods (ages 7–11 years)*

In general, children at this stage have understood logical operations with the help of concrete objects. This ability is realized in understanding the concept of eternity, the ability to classify and harmonize, able to objectively view an object from a different perspective. Children at this stage are mature enough to use logical thinking, but only physical objects that exist today (because they are called concrete operational stages). However, without physical objects in front of them, children at this stage still have great difficulty in completing logic tasks.

*f) Formal operational period (11 years old to adult)*

Children at this stage have been able to do reasoning using abstract things and using logic. The use of concrete objects is no longer needed. Children can reason without having to deal with objects or events. Reasoning occurs in the cognitive structure has been able to only use symbols, ideas, abstraction and generalization. He could carry out operations that express relationships between relationships, understand the concept of promotion.

Based on the above understanding, it is illustrated that at the stage of cognitive abilities in normal children aged 10-11 years enter concrete operational stages. According to Piaget in [8], where children at this stage have been able to do reasoning in the learning process, children at this stage have understood logical operations with the help of concrete objects. However, without physical objects in front of them, children at this stage still have great difficulty in completing logic tasks. Whereas what happens to autistic children at the concrete operational stage has not been able to understand

the material presented, especially when the learning time is not an example of the physical object of the material being conveyed, but in the sixth grade autistic child has not reached this stage, the child cannot reason what is taught and linking existing learning is caused by neurobiologist conditions in the central nervous system in the form of incomplete growth of brain nerve cells in some parts of the brain fold. This also causes children to experience difficulties in understanding the learning delivered by the teacher. Optimal effort is needed from the teacher to understand what needs, abilities, problems or problems faced by autistic children, and need to know the pattern of children's learning so that it helps the teacher to convey information appropriately.

There are several learning patterns of autistic children including [9]:

- Rote learner, that is, children tend to memorize information as it is without understanding the meaning of the memorized symbol
- Gestalt learner, that is, children tend to see things, for example memorizing sentences in their entirety without understanding the meaning of the words contained in the sentence
- Visual learner, that is, children easily understand something that is seen rather than what they hear, for example, they prefer to learn books that are equipped with pictures, prefer to view pictures on television (TV) rather than listen to the radio
- Hands on learner, that is, children love to try to do something and get knowledge from the experience
- Auditory learner, which is happy to talk and easier to understand something they hear than they see.

By knowing the types of learning patterns that are suitable for each child with autism, the teacher is expected to be able to adjust the process of delivering knowledge and information to the learning patterns of the autistic child.

Various disorders experienced by autistic children potentially have a high risk of the emergence of obstacles in various aspects of development, both physical, psychological, social or even the totality of the development of his personality. This condition creates problems that will cause children to experience obstacles or interference in learning. In general, by Hadis in [9] reveals several disorders experienced by autistic students (children) related to learning activities including:

- Behavior: the presence of typical behavior in children with autism often makes teachers and other students in the class confused. This behavior is very unnatural and tends to divert attention. In addition to behavioral problems that are more of an impetus for neurobiological development, often behavioral problems are a manifestation of the frustration of autistic students themselves (difficult to understand learning material, difficult to communicate, difficult to interact) or the child's reaction to environmental stimulation that they cannot predict. The condition of children who tend to be overly sensitive (voice, touch, rhythm) to environmental

stimuli also often makes children behave less pleasantly. Children with autism experience disruption in the development of sensory modalities (hyper sensitivities or hypo sensitivities) so that it is difficult to focus attention on an information. This situation resulted in difficulties in selecting information received and then the information could not be processed properly.

- **Understanding:** there is a disruption in the information process and connections that cause the emergence of barriers to autistic children attending lessons in public schools. They respond more to visual stimuli, so verbal instructions and descriptions (especially long ones in complicated languages) will be difficult for them to understand. The "mono" tendency of autistic children does not allow them to do 2-3 things at once at the same time (staring while listening, listening while writing) Their visual thinking style in the form of films, pictures, or in the form of real objects, making their reactions slower than other children, where they need longer pauses before responding to something. Autistic children have difficulty focusing attention, are often distracted, especially in class with a large number of students with very frenzied sounds. This understanding process is not only determined by the ability to process information but is also influenced by the potential of autistic children. In children with autism who are classified as low functioning (low ability) an understanding of information will be more difficult to do when compared to high functioning children.
- **Communication:** is one of the disorders experienced by children with autism, where they are difficult to express their desires or abilities. The ability of an autistic child to express something is difficult to realize, for example if they are given instructions or commands, they are not easy to respond or if the child wants something difficult to express their wishes to others. Most children with autism, although able to speak but more often use short sentences with simple vocabulary. Often, they can understand what is being conveyed by others, if the person speaks directly to them or looks at them. That is why sometimes autistic children appear as if they have not heard, even though we call them with a voice that is loud enough. Autistic children who have difficulty speaking / speaking often express themselves through behavior. The more they are not understood, the more frustrated they become. An environment that is unable to see these characteristics objectively will force them to speak in expressing themselves, resulting in pressure on them which then makes them behave negatively. This situation is often considered that autistic children do not have the ability, consequently the learning needs of children are not accommodated and hampered, therefore, it is important to understand the specific things that exist in children with autism.
- **Interaction:** children with autism also have problems with the development of social skills, difficulty interacting, unable to understand the rules of association, so that they usually do not have many friends. The ability to adjust to autistic children is a very prominent problem. Hence, social interactions, communication, and

behaviors displayed often result in children being difficult to adjust to their environment. As a result, various learning activities are often difficult to be followed by autistic children. Therefore, it takes a thorough preparation and strategy so that management in the implementation of the learning of autistic children can take place.

According to the Science Learning Student Book, by Unggul in [10], Science Learning for the sixth-grade autistic children has material that is simpler and can be applied to everyday life, which includes:

- Learning about soil types

Teachers can invite children outside the classroom to study directly in the environment, introduce children to the types of land that are in the school environment. Inviting children also to practice holding what is different and fertile land.

- Learning soil structure

The teacher can teach children the easiest material to understand and use the learning media / soil structure media to support learning.

- Learning the benefits of land

The teacher can invite the children of the school environment directly, explain the benefits of the land for everyday life, the benefits of land with plants for example.

- Land management learning

- The teacher can give assignments to students, together with friends to plant crops. The teacher prepares what materials are needed. Then explain to the child how to plant plants, the child is guided to try.

It is expected that learning centered on direct practice in the field and using interesting learning media for the autistic team, can help stuttering children to better understand.

### III. METHODOLOGY

Research on identifying the ability to understand science learning in the soil material of autistic students in SLB Negeri 1 Bantul using Qualitative Descriptive approach. Descriptive research is collecting data based on factors that support the object of research, then analyzing these factors to find their role by Arikunto in [11]. Qualitative research is research that deals with ideas, perceptions, opinions, beliefs of the people to be studied and all cannot be measured by numbers.

Subjects in this study are sources of data and research information obtained. What is meant by the subject according to Spradley, by Basrowi and Suwandi, [12] is a source of information. Hence, the subject who was the source of this study were 10- to 11-year-old autistic students in State Elementary School 1 Bantul, namely two sixth-year students with 11 years of age and sixth grade teachers from Bantul SLB Negeri 1 autism.

#### A. JP subject (Male)

##### a. Knowledge of understanding of science learning

In the identification of science learning for children with autism in class VI, JP subjects include active autistic

children, the subject is also difficult to focus on what learning when hearing disturbing sounds. Subjects also like to walk here and there while learning there are 4 material aspects, namely the type of land, the structure of the land, the benefits of land and land management. In learning JP students have difficulty understanding the material in the book, when learning takes place the subject only wants to pay attention in a short time, learning science should invite children to practice directly in the field so that children understand and understand more about the material. JP has an interest in computers and cellphones.

#### *B. Subject AB (Male)*

##### *a. Knowledge of understanding of science learning*

In the identification of science learning for children with autism grade VI, there are 4 material aspects, namely the type of soil, soil structure, soil benefits and land management. AB has a low level of learning concentration, when learning takes place AB is easily distracted from the surrounding environment. If AB is bored in the lessons taught by the teacher, he usually speaks alone, daydreaming or walking in the classroom. Hence, that when learning takes place must use interesting media so that AB can focus on learning again.

Qualitative Descriptive approach method is a method of data processing by analyzing the factors related to the object of research by presenting data in more depth to the object of research. Data that has been collected will be processed and data processing done by triangulation, reduction, data presentation, conclusion drawing.

- **Triangulation**

Triangulation is a data validity checking technique that utilizes something other than data as a comparison to the data. There are three types of triangulation, namely triangulation with sources, triangulation with techniques, and time triangulation. In this study the author uses triangulation using sources, namely by checking the data obtained through several sources.

- **Reduction**

Reduction is summarizing, choosing key things, and focusing on important things. That way, the reduced data will give a clearer picture.

- **Presentation of Data**

After the data is reduced, the next step is to present the data. Data is presented in the form of narrative text. Data is presented by grouping according to each sub-chapter.

- **Withdrawal of Conclusions**

After the data is presented, the next step is drawing conclusions. After describing the various data that has been obtained, the researcher makes conclusions which are the results of a study.

Data analysis begins with conducting in-depth interviews with informants. After conducting the interview, the researcher made transcripts of the interview results by replaying the interview record and then writing the words that matched the recordings. After the researcher wrote the results of the interview into the transcript, then the researcher made data reduction by means of abstraction, which is taking data that is in accordance with the research context and ignoring data that is not needed.

## IV. RESULTS AND DISCUSSION

Based on the results of the identification of the development of knowledge and understanding of science learning both subjects, in the aspect of knowledge it is known that the subject has had good knowledge of science learning. However, these two subjects have minimal understanding of other aspects of learning soil material such as soil structure, land management and its application to everyday life. children have difficulty understanding this material. This is caused by a condition disturbance caused by a neurobiologist condition in the central nervous system in the form of incomplete growth of brain nerve cells in some parts of the brain fold. This also causes children to experience difficulties in understanding the learning delivered by the teacher.

In the identification of science learning, two subjects, JP and AB, were often distracted when learning, the difficulty of understanding the concept of learning that only focused on the book. Children are often busy themselves when learning takes place. In line with the opinion of Hadis in [8], revealing some of the disturbances experienced by students (children) of autism related to learning activities Disruption of information processes and connections, inevitably often prevents autistic children from taking lessons in public schools. They respond more to visual stimuli, so verbal instructions and descriptions (especially long ones in complicated language) will be difficult for them to understand. Their 'mono' tendency does not allow them to do 2-3 things at once at the same time (staring while listening, listening while writing, etc.). Their visual thinking style in film / picture form, making their reactions slower than other children, where they need a little longer time lag before responding. This is also what causes autistic children to experience disturbances in aspects of understanding.

This is in accordance with Piaget's opinion, by Suparno in [13]. Children at this stage have been able to do reasoning using abstract things and using logic. The use of concrete objects is no longer needed. Children can reason without having to deal with objects or events. Reasoning occurs in the cognitive structure has been able to only use symbols, ideas, abstraction and generalization, but both subjects have not reached this stage, the child has not been able to process the information that has been obtained, so that the child does not understand what is conveyed by the teacher, the learning process of children still has to learn to use concrete objects. And for reasoning abilities that still cannot use ideas and abstractions, as well as generalizations in the field. In this aspect JP and AB experience disruption in understanding science learning, especially in the delivery of abstract material, there must be an interesting and effective learning media to attract children's learning. As well as direct practice in the field will make children able to understand what material is being delivered.

## V. CONCLUSION AND RECOMMENDATION

In this study, it was identified that in the knowledge aspect, autistic students have good enough knowledge, but students cannot apply their knowledge into their daily behavior. Hence, this causes problems in the learning process.

### A. Suggestion

Teachers are expected to be able to teach understanding of IPA learning in accordance with the needs and abilities of students and can use interesting and effective learning media. The results of this study can be used as a basis for teachers to plan the focus of learning on IPA using appropriate media for children with autism. Parents are expected to be able to work with the school in the implementation of learning at school and at home, parents can take part and teach back the lessons taught at home.

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