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Family as An Educational Environment That Can Provide Science Education for Children with Special Needs

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ABSTRACT

The purpose of this study was to determine the science education provided by families to students with special needs. We used qualitative research methods. The subjects in this study were families and students with special needs (students with visual impairment, hearing impairment, intellectual disabilities, physical impairment, and Down syndrome) in one of the special schools in Indonesia. The results showed that most families fully gave up the responsibility for providing science education to school teachers. In addition, they thought that learning science is very complicated because it relates to formulas and numbers, so they thought children with special needs unable to learn about science. Whereas science education is very broad because it deals with natural phenomenon that occurs in everyday life. Students with special needs learned easily through the habituation process.

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1. INTRODUCTION

Education is a major factor in shaping a person's personality. Education has an important role in shaping the good or bad of the human person according to normative standards (Haverhals, 2007). The process of human development and education does not only occur and is influenced by the educational process that exists in the formal education system. Humans will get influence from family, school and society. In other words, the process of human education development to achieve maximum results depends on how the formal and non-formal education systems are run. The educational environment can be defined as various environmental factors that influence educational practice. According to Ki Hajar Dewantara, the environment includes the family environment, the school environment, the community environment, which is called the education tripusat or educational environment (Sari, 2016). The educational environment greatly influences the development of student potential, especially for students with special needs.

Students with special needs are children who have obstacles and problems due to both internal and external factors which have an impact on the emergence of problems in the learning process in everyday life. Children with special needs are categorized into children with special needs, permanent and temporary. The problems and obstacles they have cause them to need special education and services in the learning process. One of them is in the science learning process. Learning science is one of the subjects that must be given to students in school (Pashler *et al*., 2008). This is because the government includes science education in the national curriculum at every level of education. In basic education in Indonesia, science learning is translated into natural science subjects at school (Lie, 2007). Students can understand various natural phenomena that occur in everyday life through the process of learning science.

At this time, there are many studies that explain the process of learning science in the school environment. Both about the material (Lemke, 2001), the curriculum (Stuckey *et al*., 2013), as well as the methods and media used in science learning (Schaal *et al*., 2013). However, research is very rare that reveals the science learning process given by families to children with special needs. Whereas family is the first and foremost educational environment for children (Gutman and McLoyd., 2013). Children have more time in the family and community environment than the school environment. Therefore, the purpose of this study is to determine the process of learning science in the family environment for children with special needs in special schools in Indonesia. This has the aims and objectives as evaluation and development material for further research. There are three types of educational environments that can influence the process of student development, namely:

(i) Family. The family is the smallest unit of a society (Palla *et al*., 2005). The nuclear family usually consists of father, mother, and child. Family is the best educational environment for individual education and social education (Israel *et al*., 2001). The family is the oldest educational institution, informal in nature, the first and foremost experienced by children and educational institutions that are natural for parents to be responsible for nurturing, caring for, protecting, and educating children so that they grow and develop properly. Family education functions: as the first experience of childhood, ensuring the emotional life of children, instilling the basis of moral education, providing a basis for social education, and laying the foundations of religious education for children.

(ii) School. School is a means that is deliberately designed to carry out education (Avramidis *et al*., 2000). The more advanced a society is, the more important the role of schools is in preparing the younger generation before entering the community development process. The school's function as an institution for education, including the following; schools help

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parents do good habits and instill good character, schools provide education for life in communities that are difficult or cannot be given at home, schools train children to acquire skills such as reading, writing, arithmetic, drawing and other sciences are developing intelligence and knowledge, and in schools, lessons on ethics, religion, aesthetics, right or wrong are given, and so on.

(iii) Public. The community is an environment outside the family and school environment that provides education (Story *et al*., 2002). The education experienced in this community has started some time when the children have been separated from family care and are out of school education. Thus, it means that the influence of the education seems to be wider. There are many types and types of education experienced by a person in society, this includes all fields, both the formation of habits, the formation of understandings (knowledge), attitudes and interests, as well as the formation of morality and religion. The relationship between society and education can be viewed from three sides, namely (Aldrich and Meyer, 2015): The community as the provider of education, social institutions and / or social groups in the community, and in the community, there are various learning resources both designed (by design) and used (utility).

The educational environment has a function for the human education process (Stevenson, 2007). Each education center has the opportunity to make a major contribution to the three educational activities, namely: guidance in the effort to strengthen a cultured personal, teaching in an effort to master knowledge, and training in an effort to acquire skills. In general, the function of the educational environment is to help students interact with various surrounding environments, especially the various educational resources available, in order to achieve optimal educational goals. There is a reciprocal relationship and mutual influence between one environment and another. Family environment as the basis for shaping human attitudes and characteristics.

Children with special needs are children who have obstacles and problems due to both internal and external factors which have an impact on the emergence of problems in the learning process in everyday life. There are several categories of children with special needs, including:

(i) Children with Visual Impairments (Tunanetra). Children with visual impairments are children who have visual impairments so they need special educational services in their education and life (Perkins *et al*., 2013). Children with visual impairment are divided into two categories, namely children with low vision (low vision) and blind children (blind). Blind students need learning principles, namely: the need for concrete experiences, integrated experiences, and doing and working in learning

(ii) Children with Hearing Impairments (Tunarungu). Children with hearing impairments are children who lose part or all of their hearing power so they experience problems communicating verbally (Al-Rowaily *et al*., 2012). Children with hearing impairments need the following learning principles: do not invite to speak when turning their backs, the child is at the very front, pay attention to the child's posture which shows a more functional hearing level, provide a stimulus so that the child pays attention to the teacher's face, and provides clear pronunciation when speaking.

(iii) Children with Intellectual Disabilities (Tunagrahita). Children with intellectual disabilities are children who have below average intelligence, have problems in adaptive behavior, so they have difficulty completing tasks in everyday life (Giagazoglou *et al*., 2013). Children with intellectual disabilities need several principles in the learning process, namely: concrete and interesting media, simple explanations, and fun learning.

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(iv) Children with Physical / Mobility Impairments (Tunadaksa). Children with limb / physical impairments are children who have permanent disabilities or disabilities in the limbs or neurological disorders in the brain (Reinehr *et al*., 2010). The principle of learning for children with physical barriers must maintain the following: in terms of children's health, mobility and mobility, communication skills, self-care abilities, and children's position when using learning aids.

(v) Down Syndrome. Down syndrome children are children who have intellectual barriers (Barr and Shields, 2011). He has the same facial features because there is a mutation in chromosome 21. Similar to mentally retarded children, Down syndrome students need simple, concrete, and interesting learning.

2. METHOD

The method is one of the things that must be considered in the learning process. Most of the teachers at one of the special schools in Indonesia use the lecture and question and answer method in the science learning process. This resulted in most students getting low learning outcomes. Very rarely teachers used inquiry learning methods in the science learning process. They assumed that students with special needs will not be able to learn complex science, even if the teacher uses concrete learning media and is in accordance with children's needs, it will make it easier for children to understand science learning material.

3. RESULTS AND DISCUSSION

3.1. Demographics of Students with Special Needs in Kuningan Indonesia

This study uses a qualitative method with descriptive data analysis. The subjects of this research are parents and students with special needs in one of the special schools in Indonesia. Data collection using data tryangulation, namely interviews, observations, and documentation and portfolios. **Figure 1** shows the percentage of the number of students with special needs in a school in Indonesia. The data shows that 11% of students experience visual impairment (tunanetra), 13% of students experience hearing impairment (tunarungu), 50% of students experience intellectual disabilities (tunagrahita), 9% of students experience physical or muscular impairment (tunadaksa), and 17% of students down syndrome.

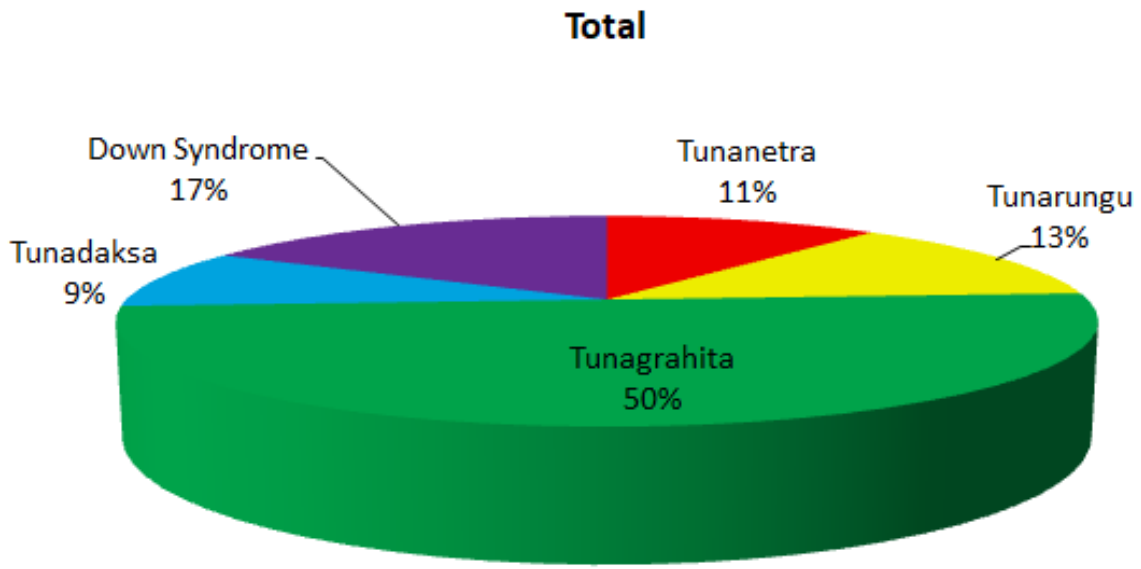

Figure 1. Percentage of total subject.

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3.2. Science Education in The Family Environment of Children with Special Needs

Science education is one of the lessons that teachers usually provide at school. Science education is very important because it has a function in increasing students' skills to understand the phenomena that occur in everyday life. Ironically, most teachers and parents judge that science education is concerned with complicated formulas and numbers. This makes the paradigm that students are very difficult to learn about science, especially for students with special needs.

The educational environment greatly influences the student achievement process, especially in science learning. Although science learning is often given in schools by teachers who are mostly taught in natural science subjects, families have the responsibility to provide education about science for their children, especially children with special needs. Children have more time with family than at school.

At this time, most parents give up full responsibility for providing science education to teachers in school. Even though not all teaching tasks can be carried out by school teachers, especially with a very short and limited time. Children have more time at home and have greater opportunities for applied learning in everyday life. Moreover, children with special needs can learn something from habituation and the environment. Most parents leave children with special needs at home without teaching various things about science education. They have the opinion that their children are difficult to teach and their abilities are limited, so they are lazy to teach their children. This, resulting in difficult children's potential to develop optimally.

4. CONCLUSION

Family is the first and foremost educational environment for children, especially children with special needs. Students with special needs are students who have various obstacles in the developmental and academic processes, so they need special education and services in the learning process. The process of providing education is not only carried out and is the responsibility of the teacher, but parents have the responsibility to provide science education for their children. Students with special needs will find it easier to understand the material taught through habituation. However, most parents are reluctant to provide science education for their children. This results in inhibition of the potential development of students.

5. 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.

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