

THE CHALLENGES OF SCIENCE EDUCATION FOR DEAF CHILDREN LEARNING AT SEKOLAH LUAR BIASA (EXTRAORDINARY SCHOOL) IN SUKOHARJO

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Abstract

Deaf children are children who experience impairment in their hearing both permanent and non-permanent. Hence they will have difficulty in learning. For deaf children, Natural Science (IPA) is a fairly difficult learning subject that many hearing impaired children have not managed to understand the subject well enough. This study aimed to describe the challenges in educating deaf children in science subjects. This study uses a qualitative descriptive study. Sources of research data are teachers, students and Headmaster. The techniques of collecting data are using questionnaires, interviews, documentation and observation. Special School's study located in Sukoharjo includes SLB ABCD YSD Polokarto, SLB B-C Hamongputro Jombor, SLB B-C YPALB Langenharjo and SLB ABC Tawangarsi. The data were analyzed through data reduction, data display and conclusion. The conclusion is presented in the form of narrative text as field's note. The result shows that there are some challenges experienced in educating deaf children in Natural Science, which includes limited capability of hearing and lingual understanding, many abstract concepts in science subject, textbooks that are not in accordance with the lingual characteristics of children with hearing impairment, the lack of teacher's ability to simplify the sentence in the subject and the inadequacy of specialized learning media for deaf children.

Keywords : *educational challenges, deaf children, Natural science learning, SLB*

Abstrak

Anak tunarungu merupakan anak yang mengalami hambatan dalam pendengarannya baik permanen maupun tidak permanen. Sehingga dalam memperoleh pembelajaran pun akan mengalami kesulitan. Bagi anak tunarungu, IPA merupakan pelajaran yang cukup sulit sehingga banyak anak tunarungu yang belum berhasil memahami pembelajaran IPA dengan baik. Penelitian ini bertujuan untuk mendeskripsikan tantangan-tantangan dalam mendidik anak tunarungu pada mata pelajaran IPA. Penelitian ini menggunakan penelitian deksriptif kualitatif. Sumber data penelitian adalah guru, siswa dan Kepala Sekolah. Teknik pengumpulan data menggunakan angket, wawancara, dokumentasi dan observasi. Lokasi penelitian di SLB Kabupaten Sukoharjo, yang meliputi SLB ABCD YSD Polokarto, SLB B-C Hamongputro Jombor, SLB B-C YPALB Langenharjo dan SLB ABC Tawangarsi. Data hasil penelitian dianalisis melalui reduksi data, display data dan menarik kesimpulan. Kesimpulan disajikan dalam bentuk teks naratif berupa catatan lapangan. Hasil penelitian menunjukkan bahwa ada beberapa tantangan-tantangan yang dialami dalam mendidik anak tunarungu pada pembelajaran IPA, yang meliputi keterbatasan kemampuan mendengar dan pemahaman Bahasa anak tunarungu, banyaknya konsep abstrak dalam pelajaran IPA, buku teks pelajaran yang belum sesuai dengan karakteristik Bahasa anak tunarungu, keterbatasan kemampuan guru dalam menyederhanakan kalimat dalam materi dan tidak memadainya media pembelajaran khusus anak tunarungu.

Kata kunci : *tantangan pendidikan, anak tunarungu, pembelajaran IPA, SLB*

INTRODUCTION

Every family must have expecting their offspring to be normal. It's just sometimes, the expectation does not match the reality. Whatever condition of the child is the best. Every children born with their own weakness and strength. That is also the case with children with special needs. These children are unique individuals. They have significant differences with normal child of their age. Because of their uniqueness, they could run into some obstacles such as studying, interacting, socializing and so on. Thus, in order to handle them growing up they also requires attention and special services.

According to Muhammad (2008: 36), Exceptional child or children with special needs are children who are different from ordinary children in terms of the characteristics of mental, sensory abilities, communication skills, social behavior or physical characteristics. These differences lead to children with special needs that require modification in the activities of schools or special education services that suit the needs of each to enable them to develop full capacity.

One type of special needs children was deaf children. This is in accordance with the Ministerial Regulation No. 70 Year 2009 on Inclusive Education For Students Who Have Abnormalities and Has Potential Intelligence and / or Outstanding Talent, student who has physical, mental or has intelligence and / or special talents are 1) visually impaired; 2) hearing impairment; 3) idiot; 4) retard; 5) quadriplegic; 6) sociopath; 7) learning disabilities; 8) slow learner; 9) with autism; 10) motoric disorder; 11) are victims of drug abuse, illegal drugs and other addictive substances; 12) had other disorders; 13) double disability.

Deaf children are children who have lost all or most of the power so that the hearing impaired to communicate verbally (Cahya, 2003: 11). In Wikasanti, 2014: 13, there are various causes of hearing-impaired person that can occur before the child is born (prenatal) or in the process of birth and the newborn (neonatal) and after child birth (postnatal).

The deaf child usually looks like a normal kid in general. the difference will be seen when we communicate with the child, it will be seen that the child was difficult to communicate and not be able to hear what we were talking. Inability to hear this causes difficulties in communicating/talking. So that deaf children will experience two difficulties, namely listening and communicating/talking.

The inability to hear and communicate well is causing children with hearing difficulties and obstacles in obtaining information. So although the level of intelligence of deaf children together with normal children, just because of constraints in the information causing misunderstanding of information received as a result of learning achievement was below normal child. Therefore we need a quality education in accordance with the characteristics and needs of children with hearing impairment that will produce quality human resources. Implementation of quality education can be seen in the learning process. If the teaching-learning process according the results obtained was in line with expectations.

Special guidance given to children with hearing impairment not only on the need kompensatorisnya with BKPBI material but also on the needs of education in general knowledge. Deaf children also need to know what is in the surrounding environment.

One common subjects who introduced the neighborhood is Natural Science (IPA). Natural Science (IPA) was introduced in SLB Integrated Science SMALB and SDLB both levels. No grouping such as public schools, which include Physics, Biology and Chemistry. Science education is expected to become a vehicle for students to learn about themselves and the environment, as well as prospects for further development in applying it in our daily lives. The learning process emphasizes providing direct experience to develop competencies in order to explore and understand the universe around scientifically.

Learning science in SMALB Salingtemas emphasizes learning (science, environment, technology, and society) are directed to the learning experience to design and create a masterpiece through

the application of science concepts and scientific worker competence wisely. Learning science in SMALB emphasizes providing direct learning experience through the use and development of process skills and scientific attitude (BSNP, 2006). Science teaching deaf children is not easy, their hearing impairment it causes in the teaching of science becomes more challenging.

Based on this, required the identification of the challenges in educating deaf children in learning science so that they can find a way out to address these challenges and will achieve the expected results.

RESEARCH METHODS

This study will examine about the challenges in educating deaf children in learning science. The method used is a qualitative research method. According Arikunto (2010: 3), qualitative research is “research that is intended to investigate the circumstances, conditions, or other things, that the results are presented in the form of research reports”. Location of the study in 4 SLB in Sukoharjo district, which includes SLB ABCD YSD Polokarto, SLB Hamongputro Jombor B-C, B-C SLB YPALB Langenharjo and SLB ABC Tawangarsi. Source of research data is the eleventh grade teachers and deaf students in class XI. The technique of collecting data using questionnaires, interviews, and observations. Data analysis was performed using data analysis techniques interactive model. According to Miles and Huberman (Herdiansyah, 2010: 164) data analysis technique consists of four stages, namely data collection, data reduction, data display and draw conclusions. Conclusions are presented in the form of narrative text form field notes.

RESULTS AND DISCUSSION

Research result

Based on data collected through questionnaires, interviews and observations showed that:

Deaf Children Language Comprehension

Table 1. Language Understanding Deaf Children

No	Comprehension level	Ammount	Percentage
1	Very Understanding	0	0%
2	Less Understanding	5	100%
3	Not Understanding	0	0%
Total		5	100%

From the data collected through questionnaires about understanding the language of deaf children obtained the data of five respondents stated that understanding English teacher of deaf children that they are guided are still lacking. It is also supported by the results of interviews and observations when students are required to understand a reading and explained again, they can not tell exactly the intent of the passage, as well as students are asked to make a simple sentence, a sentence structure that they do not correspond with the position of the word in the phrase.

The content of Lesson NATURAL SCIENCE (IPA) Concept

Table 2. *The content of Lesson NATURAL SCIENCE (IPA) Concept*

No	The content of concept	amount	percentage
1	Concrete concepts	0	0%
2	Abstract concept	5	100%

Total		5	100%
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From the results of data collection on the content of the concept of science subjects obtained data from five teacher respondents stated that most of the concepts that exist in science subjects is an abstract concept. Though deaf children is very difficult to understand an abstract concept, deaf children can not imagine an abstract thing that will happen confusion and misunderstanding when a lot of abstract concepts in a subject.

The existence of Natural Science Textbooks

Table 3. The existence of Natural Science Textbooks

No	The existence of Books	amount	percentage
1	Exist	5	100%
2	Not Exist	0	0%
Total		5	100%

From the results of data collection about the existence of science textbooks in schools found that 5 teachers expressed in their school science textbooks have to SMALB, just that there were only two pieces, and there is even one fruit. There is no science textbooks for each student.

Language in Natural Science Textbooks

Table 4. Language in Natural Science Textbooks

No	The use of language	amount	percentage
1	long sentence	5	100%
2	Simple and short sentences	0	0%
Total		5	100%

From the results of data collection result 5 teachers stated that science textbooks in the schools they are still using the language with a long sentence, so that students' difficulties in understanding a sentence in the book. Although the book is a book for SMALB, but the book is not reserved for deaf children, so that the language used was also not suit the needs and characteristics of children with hearing impairment.

The ability of teachers to teach science for Deaf Children

Table 5. Teacher Ability in Teaching Science

No	The use of language	amount	percentage
1	capable	1	20%
2	unable	4	80%
Total		4	100%

From the results of data collection result 4 teachers lack the ability in science teaching deaf children. This is because they are special education graduates who have not learn science while science material for deaf children in class XI is a matter of public school level so requires understanding the material. In addition it needs the capability to simplify the sentence to make it more simple so easily accepted and understood deaf children.

Availability of special media science teaching Deaf children

Table 6. Availability of special media science teaching deaf students

No	Ketersediaan	amount	percentage
1	Exist	0	0%
2	Not Exist	5	100%
Total		5	100%

From the results of data collection on the availability of special media science teaching deaf students all respondents teacher data obtained by 5 respondents said no media devoted to science teaching deaf students. From interviews of teachers said that they are more frequently using media images to hang students.

Discussion

Learning science is fairly elusive subjects deaf children. A normal children sometimes have difficulty in understanding the material science. Moreover, deaf children who have limited hearing. The hearing impairment causes the information received by children with hearing impairment levels are much different than normal children, even the information received can also be received differently by children with hearing impairment that would frequent misconception (misconception). Therefore, in teaching science to children with hearing impairment is a major challenge for teachers.

This hearing impairment also cause hearing impaired children experience language problems. As the results of studies showing that children with hearing language understanding is lacking, where deaf children usually only know the basic verb or simple sentences. In addition, children with hearing impairment is also minimal in the vocabulary of the objects so that when teaching a matter we must show concrete objects from what we explained that students are better understood. Problems English / verbal communication is one of the problems experienced by children with hearing impairment, whereas in the learning process of verbal ability was highly preferred for delivery of material. If the child does not have good verbal skills then in receiving the material will experience significant barriers. This is in accordance with the expression Sungmin Im and Ok-Ja Kim (2014) which states that "it is well Recognized that for all students to experience success in science education, literacy needs to be Considered as a crucial factor when setting educational goals among students with limited language proficiency ". To achieve the required success of science learning objectives are important factors that literacy or language.

Language issues aside, to do with learning science, special characteristics of science that studies natural phenomena either true or factual events and the causal relationship is also a problem for deaf children in learning science. This is due to children with hearing difficulties in connecting a causal event, especially if the event is an abstract concept, which is difficult to imagine for deaf children. As the results showed all respondents stated that the subject matter teachers Class XI NATURAL SCIENCE (IPA) mostly in the form of abstract concepts. So as to explain the concept to students experiencing difficulties. This is consistent with the statement of Mukhopadhyay and Moswela (2010):

Science subject was considered as a case for understanding the difficulties faced by students with hearing impairments when learning science concepts in Botswana primary special schools. Students with hearing impairments in Botswana primary schools are substantially lagging behind when it comes to acquiring science concepts instanced by their poor performance in science subjects as measured in Primary School Leaving Examinations.

This problem could be attributed to inflexible curriculum, language barriers and inadequate support services.

Deaf children are still difficulties in understanding the concepts of science (Natural Science (IPA)) causing them to fall behind and obtain poor results in learning science. This problem can be attributed to not flexible curriculum, language barriers and inadequate support services.

The next challenge or problem facing science teachers in teaching deaf children is the existence of science textbooks. The results showed the existence of science textbooks still minimal, ie one school only had 2 pieces of special SMALB science textbooks, where the book as a student and the other handle is placed in the library. As for the students do not have textbooks that can be taken or read at home. So that during the learning teachers always give a note of the material covered.

The next challenge is the language used in textbooks. Textbooks are provided not in accordance with the characteristic language of deaf children. The language barrier experienced by children with hearing impairment causes them difficulty understanding sentences mean for long sentences and many words they do not know, let alone the terms NATURAL SCIENCE (IPA) much they do not know. Based on observations, children with hearing only understand short sentences and words used in the sentence should be the basic words. Similarly, when a deaf child was asked to make sentences the sentence structure that they make will be alternating sequence. Therefore, when teaching science teacher of deaf children need to simplify the sentence so that the material can be well received by the students. In this sentence is very necessary to simplify the acquisition and retention of material from a teacher to a simplified when the sentence would not change the meaning or the essence of the material being taught. Based on the research results, the ability to simplify the sentence is still owned by the teachers because most teachers are graduate teachers PLB that has not learn science so that mastery and understanding of the material less and to simplify the sentence without changing the core of the material being taught was also lacking.

Weight characteristics of deaf children in reading and written language submitted by Meadow and Mayberry (2001), which revealed *“Profoundly deaf children are disadvantaged as potential readers on both of these count. they do not have easy access to the phonological code and many do not know any language well, let alone the language captured in print”*. This heavy deaf children feel disadvantaged in terms of reading because they do not have easy access to the phonological code and many do not know any language, especially written language.

The next challenge is found in this study is the lack of availability of special media science teaching deaf children. Most of the media owned by the school is a learning medium and normal children. However teachers are also trying to change the media to be used and understood as teaching materials for children with hearing impairment Natural Science (IPA). Based on interviews with teachers, most teachers use to teach science media image deaf children because teachers feel with media images of deaf children can see directly the objects or the material being taught. So there will be confusion in the understanding of the material. Only the use of this medium is still very rare frequency.

In education of children with special needs, the use of instructional media is an important component of the educational system that is collected. Buckingham (2008: 3) said *“a medium is something we use when we want to communicate with people indirectly, rather than in person or by face to face contact”*. The point is that the media is something that we use when we want to communicate with the indirect, rather than direct contact. Medium of learning for children with special needs (ABK) is a media that has been modified according to the needs of the learners because not all of which are in the public media can be used in teaching children with special needs. Incompatibility media with the needs of children with special needs levels cause children with special needs (ABK) have not been motivated at the same time develop the attitude and ability of the child's personality, talents, mental abilities to achieve their optimum potential.

Similarly for deaf children, also requires media that according to the characteristics and needs of children with hearing impairment.

In Sartika (2013: 42), suggested that a deaf child has limitations in speaking and listening, thus learning media suitable for deaf children is visual media and how to explain it with English lip/ lips. One type of visual media is print media that can be either books, modules, magazines, newspapers, pictures and so on. Selection of visual media is due to the sense of sight is the sense of remaining and greatest influence in learning compared to other senses receive. This means that media images used by special-ed teacher in Sukoharjo for deaf children is appropriate.

The same thing about a deaf child as a visual learner delivered by Kuntze, Golos and Enns (2014) which stated that *“in deaf education the fact that deaf children are by nature visually oriented has been historically marginalized in favor of focusing on a lack of auditory access”*.

Sholihah, et al (2015) showed that deaf children feel happy when a medium of learning and teaching materials used by teachers, specifically intended for deaf children because they are easier to understand the material presented in the instructional materials. Teaching materials are made attractive with illustrations can cultivate students' interest to learn the material.

With the existence of these challenges spur teachers to find a way out so that the learning can run smoothly and challenges that exist can be resolved so that the students will succeed. Learning science is an interaction between the components of learning in the form of the learning process to achieve the objectives in the form of competence has been determined. Learning science is a system, consisting of components of the input of learning, the learning process and learning output. Learning input component is a required component learning process to be able to run with the maximum covering curriculum, teachers, teaching methods, instructional media, facility / infrastructure of learning, the environment and the learners. With the availability of the components of a complete learning input will cause the learning process can be run in accordance with the planning and eventual outcome / output learning was as expected that learners are successful in this case is that successful deaf students.

CONCLUSION

Based on the results of the discussion above it can be concluded that the challenges facing education in science teaching deaf children are:

- d. Limited ability of hearing and deaf children language comprehension.
- e. The number of abstract concepts in science lessons
- f. Textbooks that are not in accordance with the characteristic language of deaf children.
- g. Limitations teacher's ability to simplify the sentence in the material.
- h. The inadequacy of specialized learning media deaf children.

Thus be a need to address the challenges of education of deaf children in learning science is to maximize the learning input that includes curriculum, teachers, teaching methods, instructional media, facility / infrastructure of learning, the environment and the learners. So that would be obtained maximum results are successful learners.

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