

The Use of Technology and Teachers' Competency Development in Inclusive Education Learning: A Study in Central Java, Indonesia

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This study aims to provide an insight for an application of inclusive education in the institutions of early childhood education and the ability of teachers to use instructional technology in inclusive classes. Part of the success of the application of inclusive education at the level of early childhood education is the perception of teachers as the mainstream educators to children including those with special needs and their management of learning; including the use of media and learning resources. This research applied survey research that involved 25 teachers who teach in inclusive classes in the Central Java region. The data source of this research was obtained through an instrument in the form of a questionnaire with open and closed questions. The result found that in the application of inclusive education, teachers have positive perceptions and beliefs towards the implementation of inclusive education. The utilisation of media and technology-based learning resources in supporting the learning process in inclusive classes is influenced by age factors of the teachers themselves, where early childhood education teachers who are older and have extensive teaching experience are having difficulty in utilising technology-based media and learning resources due to their inability to use them. On the contrary, young teachers who already have experience in using technology will be able to utilise technology-based media and learning resources more significantly and efficiently, without denying that learning will be more meaningful if accompanied with concrete media and learning from the surrounding environment. The results of the observations and interviews conducted also showed that teachers still experience some difficulties in classroom management because of their limited management knowledge and skills in the inclusive classes. They need to do some training to improve their competence to

manage the learning process for children with special needs in inclusive classes.

Key words: *Inclusive Education, Instructional Technology, Teacher Competency, Early Childhood Education.*

Introduction

Competence is defined as what is known and can be done by someone in accordance with the knowledge, skills and dispositions needed for one's potential to function effectively (Bellm, 2005; Winton, McCollum, & Catlett, 2007). In addition, McClelland (1973) in his research of psychology concluded that competence consists of knowledge, attitudes and skills. The balance of the three will make a person become competent and will increase his/her work ability optimally (Soemantri, 2010). Adey et al (2004) emphasize that teachers will remain the centre of the education system, and thus the development of a sustainable teacher profession is the most important force in improving education. This means that the presence and role of the teacher becomes very important in the learning process in the classroom regardless of the shortcomings that are owned by the teachers in conducting the learning process. The need for teachers to develop their professionalism is also a demand so that teachers can reflect and improve their learning patterns and systems, so they can also follow the development of science in their respective fields.

According to Husein (2017), there are three key pillars of professionals, including: a) Knowledge, where a professional person has a good thinking capacity, which can be used to solve any problems that arise and have a variety of knowledge related to his field; b) Expertise, which means mastery of scientific substance or expertise. It also said that expertise is a skill that a person has in a particular field in order to operate his work more easily and precisely; and c) Academic Preparation, which is based on the achievement of professional degrees including teachers, needs some special education requirements, in the form of formal education and other education which support their skills or professional abilities. Educators or teachers in early childhood educational institutions are professions which require competence, knowledge, attitudes, skills, and special expertise in the field of early childhood (Sujiono, 2009: 40). The characteristics that must be possessed by an early childhood teacher include having responsibility and awareness in educating, teaching and guiding children, as well as having the ability to design learning programs and also the ability to organise and manage classes professionally.

Observing that the educational process is moving toward to the inclusive education trend, the inclusive class competencies which are possessed by current early childhood education teachers are only referring to personal and social competencies, while leaving pedagogical

and professional competencies to be almost untouched as parts of necessary competencies for the inclusive process on learning needs for children/learners. A number of facts obtained from the results of research in several countries that have implemented inclusive education found that there is still a lack of concepts about inclusion held by teachers, knowledge and skills of teachers in helping children in inclusive classes, and a lack of teacher expertise in the inclusive learning process (Barbara & Joyline, 2014; Fleig, Forno, Bahia, & Veiga, 2015; Sylod, 2016).

Pedagogic and professional competence has a very big role in achieving effective inclusion learning. One of those two most important elements of competence in the management of learning is the skill of using instructional technology. Sheels & Richey (1994) define instructional technology as both theory and application. The categories for teaching technology are as a source of information, as a tool or a vehicle that has an attraction for students (Öztürk & Dağistanlıoğlu, 2018).

The success of inclusive education is partly influenced by teachers' perceptions as the mainstream for children with diversity including children with special needs, as well as the extent to which teachers can make adaptations to accommodate differences that each individual has. If teachers have very good knowledge and understanding of inclusive education, then they will be able to plan and manage learning according to children's needs to the optimum. Teacher professional development requires an educational process in the form of training. Several studies have hinted that teacher competencies and preparing teaching and learning interactions is needed in inclusive practice (Bailey et al., 2014; Holmberg & Jeyaprabhan, 2016; Goddard & Evans, 2018). Increasing the knowledge and skills of teachers in managing learning, is expected to provide a positive attitude in the implementation of inclusive education in Central Jawa, Indonesia.

This study aims to describe the teacher competency towards children with special needs and the implementation of the use of instructional technology to support the learning process in inclusive classes.

Methodology

This research is a quantitative research using survey as the data collection procedure. Surveys conducted were cross-sectional surveys by collecting data one by one at a time (Creswell, 2014).

Research Design

Participants

In total, there were 25 participants from inclusive pre-school institutions located in Semarang City in Central Java who joined the study voluntarily. The participant's characteristics were reported in Table 1. The majority of participants were females, working as a teacher at the pre-school, and had been working more than 10 years.

Table 1: Participant's Characteristics

Characteristics	n	%
Gender:		
Male	5	20
Female	20	80
Teaching Period:		
< 5 years	2	8
5 - 9 years	3	12
10 - 19 years	6	24
20 - 29 years	8	32
30 - 39 years	6	24

Instrument

The data collection in this study is conducted using a questionnaire consisting of open questions and closed questions. Closed questions are related to demographic data from participants while open data reveals the application of inclusive education which consists of three aspects, namely teacher perceptions about the involvement of handicapped children in inclusive classes, teacher beliefs about the excellence of inclusion, and the professional role and function of teachers. Questions relating to the use of instructional media in the management of learning in inclusive classes consisted of aspects of the use of technology-based media and aspects of the use of technology-based learning resources.

Data Analysis

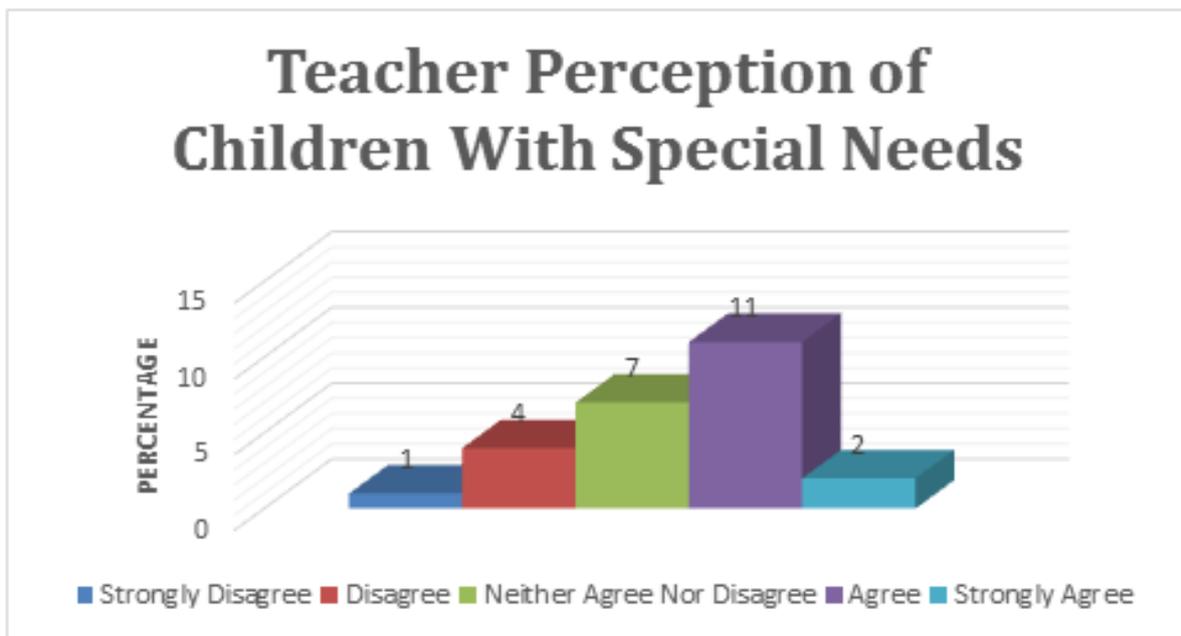
Quantitative data are analysed through descriptive statistics using a percentage of the answers given by the participants. The supporting data in the form of observations and interviews are also used in this study.

Results and Discussion

Implementation of Inclusive Education in Early Childhood Educational Institutions

Oswald (Vislie, 2003: 33) states that inclusion is a process in which schools try to accommodate all students as individuals in an inclusive and supportive community. Inclusive teachers are teachers who have an attitude of acceptance of differences, have an attitude towards alternatives faced to appreciate all types of skills, and have flexibility and tolerance. Teachers' attitudes toward handicapped children will influence the process of implementing inclusive education in schools. The results of the analysis of answers from thr 25 participants related to the perception of the teacher and handicapped children in the inclusive class are listed in diagram 1.

Diagram 1. Teacher Perception of Exceptional children

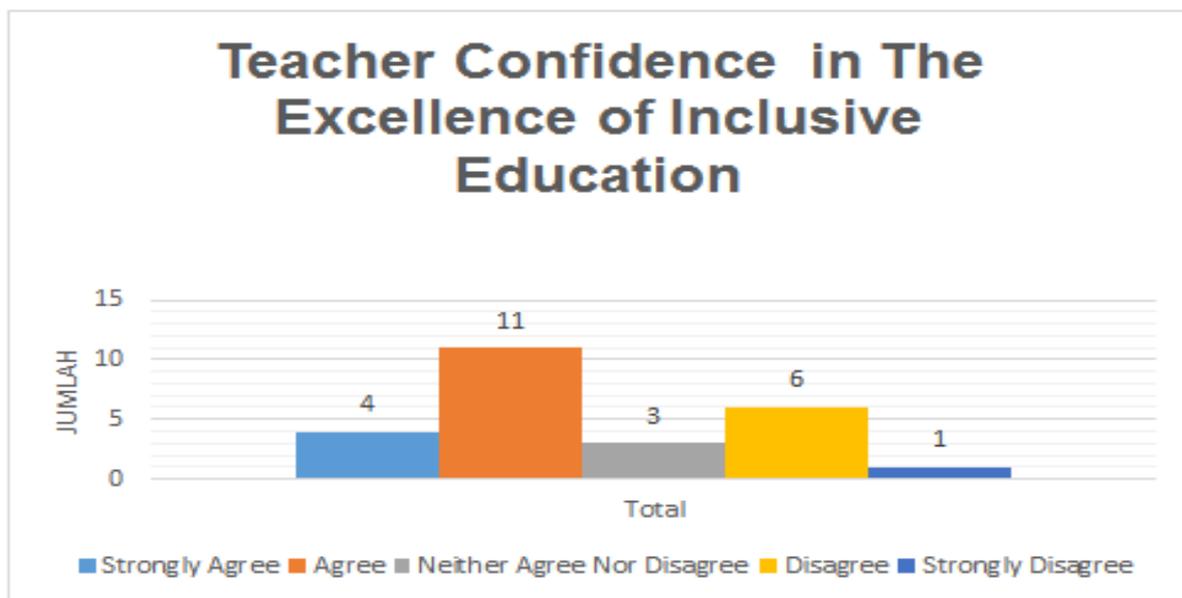


Based on the analysis of the data above, it can be explained that from the total of teacher participants, 8% of teachers answered strongly agree, 44% answered agreed with the special needs of children at mild and moderate levels and were involved in the classroom. While 16% answered disagree, 4% answered strongly disagree on the existence of handicapped children in their classrooms. The remaining 28% were neutral where when looked upon the questionnaire as they did not provide answers to these questions. The data shows that some teachers already have positive perceptions and attitudes towards handicapped children in their class and have implemented inclusive education in their schools. Some of the teachers have negative perceptions and attitudes by denying to accept the children with special needs in

their classrooms. However, this rejection is based on the inability of teachers to manage the learning process in an inclusive classes. A number of studies have described the lack of adequate teacher preparation in inclusive practice leaves teachers powerless and unable to provide curricula which meet the learning needs of children with special needs (Akalın, Demir, Sucuoğlu, Bakkaloğlu, & İşcen, 2014; Agbenyega & Klibthong , 2015). It is not easy for early childhood education teachers to design a learning process that meets the needs of every child, including children with special needs. This is not just about placing students with special needs in the main classroom, but also how a teacher plans the quality of education for all children including their attendance, participation, acceptance and achievement that have been done by handicapped children (Windiarti & Adderley , 2015).

The next question is related to the teacher's belief in the excellence of inclusive education that is applied to early childhood educational institutions. The results of the data analysis of these questions are presented in diagram 2 below.

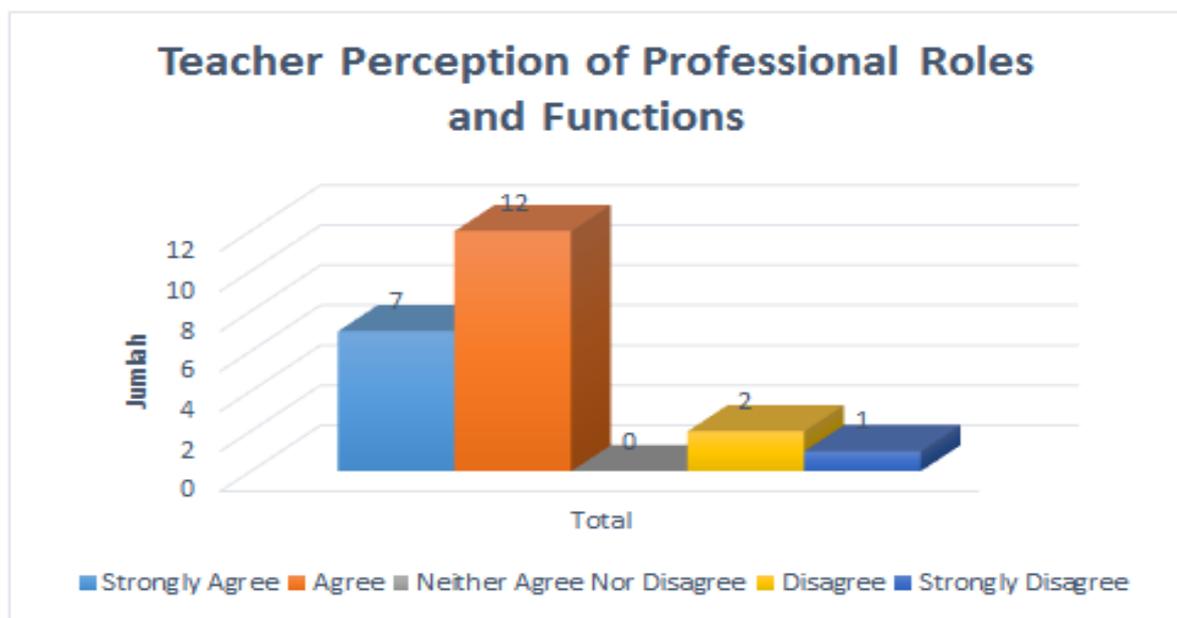
Diagram 2. Teacher Confidence in The Excellence of Inclusive Education



The results of the data above show that almost half of the total teacher participants expressed confidence in the excellence of implementing inclusive education in schools. Only 40.49% expressed doubts and were neutral towards the application of education. They do not believe that inclusive education is a good step for all the children to recognise diversity and for the handicapped children themselves to become a part of the acceptance to attend education. Teachers who already have positive perceptions and attitudes towards inclusion believe that children with a variety of diversity and handicapped children will be able to follow the process of activities in the inclusive class. Lopez & Riveiro (2018) in their research

emphasized that schools need to rethink their educational approaches so that they will be able to meet the needs of each child in the class. Teachers' need for self-development to manage learning in inclusive classes is an important part of the implementation of inclusive education, especially in early childhood educational institutions. Diagram 3 below shows the perception of the professional role and function of the teacher as a form of self-development in the inclusive class.

Diagram 3. Teacher Perception of Professional Roles and Functions



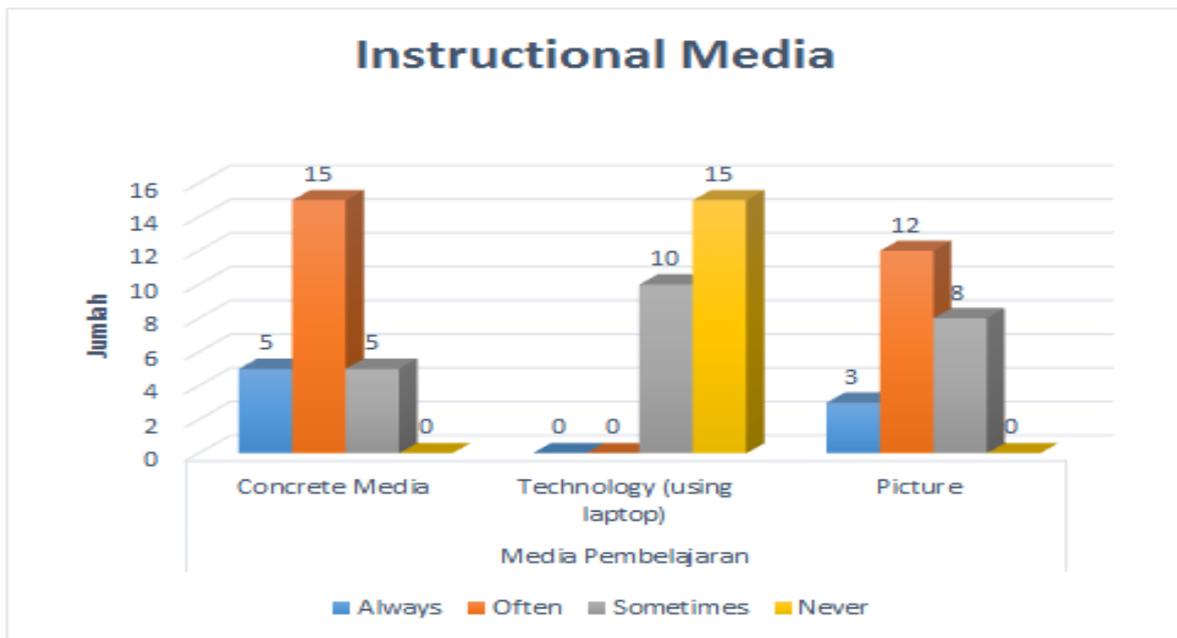
The success of implementing education inclusion is influenced by many factors. According to the European Development Agency in the field of Special Needs Education, teachers who teach in inclusive classes need to have appropriate skills, knowledge and understanding, and certain values related to attitudes to be able to work effectively in inclusive classes (Borg, Hunter, Sigurjonsdottir, & D'Alessio, 2011). Rabbi & Zulkefli (2018) in their research stated that success in the teaching process for children with learning disabilities at school requires the competence of a teacher who can teach in inclusive classes. A change of paradigm is needed by inclusive education so that the educational needs of children with various obstacles can be optimally served.

The development of the role and function of teachers in inclusive education involves content of knowledge, attitudes, and skills that teachers must master. Teachers who teach in class must have curiosity and continue to learn to develop their knowledge. The knowledge content that will be owned by the teachers is based on Bloom's taxonomy which has been revised by Anderson and Krathwohl (2001) at the level of knowledge, which is built on the process of developing teacher competencies to improve professionalism. A teacher is expected to have a

level of knowledge up to the level of metacognitive where the teacher's knowledge is built on the concepts he has received, which subsequently through these concepts they can design strategies in the learning process for children in inclusive classes, and can carry out self-development on an ongoing basis. Professional training and learning for teachers can open new perspectives and improve the learning process to be more effective so that the implementation of inclusive education that accepts diversity of children can be applied optimally (Bendová, Čecháčková, & Šádková, 2014; Agbenyega & Klibthong, 2015).

Instructional Technology Use to Support the Learning Process in Inclusive Classes

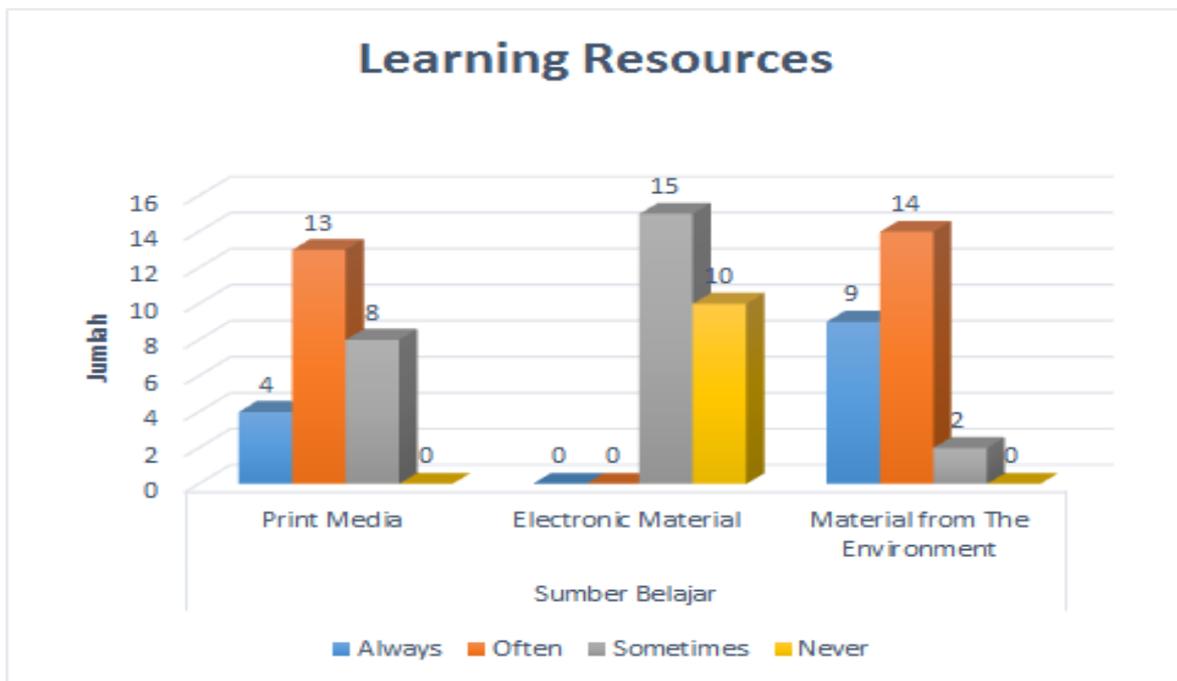
Diagram 4. Teacher Using Instructional Media



The diagram above shows the results of research related to the use of instructional technology/educational media in the form of educational media and learning resources to support the learning process in inclusive classes, especially in early childhood education. Based on these results, it can be described that the use of instructional media in the form of concrete media by early childhood education teachers is greater compared to the use of laptop technology or image media. As many as 41.30% of children education teachers use concrete media as a medium of learning in the classroom. The remaining 30.43% of teachers use image media and 28.26% of them use technology such as computers and laptops as learning media in the classroom. Basically, learning media allows all the traditional ways to deliver lessons or can use new learning using technology such as computers, interactive video and multimedia (Reisser & Dick, 2016). Diana (2013) states that teaching younger children is different from teaching adults where there are characteristics that need to be considered in

creating effective instruction in teaching. Meaningful learning for young children is a kind of learning that requires direct interaction with real objects. Concrete media provides opportunities for children to get to know more exploratory ways such as touching directly on material objects to be given. The use of concrete teaching and learning resources can help in the development of the five senses of the child and increase understanding of basic concepts in children (Montessori, 1998; Karaka, 2009). The selection of learning resources is very supported in the learning process. Kanno & Onyeachu (2018) in his research emphasized that instructional media for the children with special needs must be relevant to the specifications of their needs, look for the level availability, adequacy and give achievement for learning goals. Besides the use of the instructional media, teachers must be prepare their material with the correct learning resources. The result of the use learning resources in inclusive classes are illustrated in diagram below.

Diagram 5. Teacher Using Learning Resources



The use of learning resources for early childhood educational teachers in inclusive classes shows that in the selection of learning resources, as many as 13 participants of teachers often used print media such as picture books, encyclopedias, and other print sources. 14 participants of them often utilise learning resources that come from the environment around children and the remaining 15 participants of teachers sometimes use learning materials that come from electronic sources. Effective learning resources for young children are learning resources that exist around the children. For young children, learning from the environment can provide a extraordinary experience where children will have the ability to analyse well if



they can interact directly with the environment (Edgar Dale in Sujiono, 2004). A study shows that media and learning resources can help children to develop holistically, where the media and learning resources develop children's knowledge, affective, and attitudes. The using of instructional media and learning resources can develop cognitive skills for children who are currently still thinking concretely (Hasdjiandito, Adiarti & Wantoro, 2015). For early childhood, media and learning resources also develops psychomotoric skills because they can be directly involved in the use of media and other learning resources (Onyango, 2014). The study noted that teachers also must be able to sort and use appropriate instructional media and learning resources for the diversity of the children in inclusive classes.

Conclusion

Teachers have an important role in managing the learning process in inclusive classes. A positive attitude alone is not enough to give success to the application of inclusion in school. They also must have competencies in the form of knowledge and skills in managing the learning process in inclusive classes. Teacher skills in managing the learning process with the use of media and children's learning resources must be improved so that the learning process of children can be implemented to the fullest. Media and learning resources are very important factors for the successful implementation of education regardless of the program, including in inclusive classes. Media and learning resources that are relevant and appropriate in terms of quantity and quality expected to be available in every early childhood educational institution and they can facilitate the diversity of children in inclusive classes.

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