The Use of Animated Video to Increase Early Childhood Knowledge about Disability and Their Behavioral Intention toward Disabled Peers

1Hanifah Sabila, 2Farida Kurniawati

1Faculty of Psychology, Universitas Indonesia, Depok, Indonesia
2Department of Educational Psychology, Faculty of Psychology, Universitas Indonesia, Depok, Indonesia

Abstract This study aims to determine the effectiveness of learning through video animation in increasing knowledge and behavioral intentions of children aged 5-6 years towards children with disabilities. This effectiveness is then analyzed to see whether it can last for a certain period after the learning process. This research was conducted on 7 students who attend inclusive kindergarten and do not have special needs. The measurement instrument used is the Children's Understanding towards the Special Needs People Scale and Behavioral Intention Scale. The results of data analysis show that learning through video animation is quite effective in introducing disability due to an increase in average scores on both scales. In the Children's Understanding towards Special Needs People Scale, the average value increased from 11.86 at the pre-test to 14.71 at the post-test. While the Behavioral Intention Scale also increased the average value, which is 36.57 at the pre-test to 37.57 at the post-test. However, the results of statistical analysis using the Wilcoxon signed-rank test showed that there were no significant differences (p > 0.05), both in children's knowledge (p = 0.17) and behavioral intentions towards people with disabilities (p = 0.141) before and after video screening. Two weeks after the intervention period, the results of data analysis also showed insignificant results (p> 0.05), both on children's knowledge (p = 0.5) and behavioral intentions (p = 0.414) towards people with disabilities. The absence of significant differences in the 2-week period after the intervention showed that children's knowledge and their behavioral intentions towards people with disabilities tended to persist. A discussion of the results of the study and some recommendations for further research are written in the end.

Keywords: Disability, animated video, early childhood, inclusive kindergarten.

1. Research Background

Inclusive education is one of many efforts in providing education services for all children regardless of their background and abilities differences. Inclusive education aims to fulfill the rights of all children to obtain education and optimizing all of the children's potential (Freiberg, 1995; in Budiyanto, 2012). In this context, children who have physical, social, emotional, and mental disabilities also have the right to have access to education with the quality similar to other children who do not have disabilities, especially children at their early age. This equality is intended so all children get the same educational services without discrimination and to increase the social participation of special needs children that will give impacts on their development process.

Inclusive education services also provide several benefits, both for special needs and regular children. Special needs children in the inclusive classroom can learn better, their academic ability is increasing and develop more adaptive behavior compared with special needs children in a special school (Dessemontet, Bless, & Morin, 2012; in Lee, Yeung, Tracey, & Barker, 2015). The presence of special needs children in inclusive schools also gives a positive influence on the regular children. Some of these benefits include the
increasing capability for regular children to tolerate and make friendship with special needs (Leigers & Myers, 2015), they can accept the differences between each individual, have more knowledge about disabilities and lower level of (Guralnick, 1994; in Capell, 1997), have a better sensitivity towards other people needs and helpful towards their special needs classmate (Turnbull, Turnbull III, Shank & Smith, 2004; in Hooser, 2009). These positive influences can be developed at best if started at the preschool stage, where the children judgment is still malleable or easy to be shaped so it can help them to accept their special needs friend better (Bricker, 1978; Bricker & Sandall, 1979; Turnbull, 1982; in Capell, 1997).

However, the existence of special needs children and regular children together does not make the acceptance process toward the special needs children automatically happen. Koster, Pijl, Nakken, & van Houten (2010) stated that special needs children often have difficulty to be accepted by their regular peers. Leigers & Myers (2015) in their research stated that special needs children often experience social isolation when compared to their regular peers. Special needs children's differences can also trigger rejection from their regular peers. Ajzen (2005; in De Boer, Pijl, Minnaert, & Post, 2014) also explained that the direct interaction experience with special needs children and the knowledge that the regular children have about special needs people can influence their judgment and behavior towards their special needs friend. Therefore, children who do not have the knowledge and lack of experience in interacting directly with special needs people will have different judgment and behavior towards their special needs. In the context of early age children, Cooper (2003) found that preschool children have very limited knowledge and experience with special needs people. Thus, regular children need to be given more knowledge about special needs people so they can have more positive judgment and be more accepting of the differences that the special needs people have.

Having knowledge about special needs children, regular children's behavioral intention with special needs children can be more increasing, especially in an inclusive school environment. Hartup (1996) states that children in kindergarten level tend to play and interact with children that have similarities with them, not only similarities in gender but also in age, economic status, ethnicity, personality (friendliness, helpers, aggressive), and school performance (in Copple & Bredekamp, 2009). The differences that special needs children have, such as behavior or prominent characteristics (using a wheelchair or hearing aid), can affect the quality of interactions that occur between regular children and special needs children in inclusive schools. In this case, it is necessary to provide information to regular about the conditions that their special needs friends have. Ajzen and Fishbein (1980) using the theory of reasoned action explained that individuals through the process of conscious reasoning choose behaviors to be performed in certain situations (in Laws & Kelly, 2005). In this case, the children's knowledge related to special needs people has an important role for the regular children in choosing what behavior to act when they meet special needs children (Laws & Kelly, 2005).

One attempt to help children learn about disabilities is to provide children knowledge about characteristics and how to interact with people with disabilities. This can be done by providing direct experience and indirect experience to children. Direct experience can be provided through direct contact with individuals who have a disability (Favazza, Phillipsen, & Kumar, 2000). In this case, the inclusive education system has provided opportunities for children who are not disabled to interact directly with children with disabilities. By providing opportunities for children who are not disabled to learn and interact together in the same environment, it is expected to facilitate children who are not disabled to understand differences (Gottlieb & Leyser, 1981; Mallory & New, 1994; in Capell 1997).

Besides through direct experience, children's learning experiences about people with disabilities can be provided through indirect experience. Indirect experience can be provided by providing information through books or stories, directed discussions, puppets, and also through simulation activities (Favazza & Odom, 1997). In research that uses books or stories, children will be read stories about disabilities and then invited to discuss related
stories that have been read (Favazza et al., 2000; Martinez, 2007; in Lindsay & Edwards, 2013). In several studies that use puppets, children are shown puppets with disabilities and there is a narrative for each doll (Binkard, 1985; in Lindsay & Edwards, 2013); and children are invited to play together with puppets depicting individuals with mental disorders (Pitre, Stewart, Adams, Bedard, & Landry 2007; in Lindsay & Edwards, 2013). In studies that use simulations, research respondents are invited to practice sign language and use a wheelchair (Loovis & Loovis, 1997; in Lindsay & Edwards, 2013); using a virtual simulation program where children as if sitting in a wheelchair and facing several obstacles such as stairs, narrow doors, and reaching tall objects (Pivik, McComas, Macfarlane, & Laflamme, 2002; in Lindsay & Edwards, 2013); and play basketball in a wheelchair with a basketball athlete that using a wheelchair (Hutzler, Fliess-Douer, Avraham, Reiter, & Talmor, 2007; in Lindsay & Edwards, 2013). The results of some of these studies indicate that the use of puppets, children have increased knowledge about disability, have a more positive view towards people with disabilities, and improve children's attitudes towards individuals who have mental disorders. Whereas in studies using simulations, children have a more positive attitude towards people with disabilities and children experience increased knowledge of the obstacles faced by persons with disabilities who use wheelchairs.

In addition, using books, puppets, directed discussions, and also simulations, the provision of indirect experiences of persons with disabilities can be provided through multimedia. In studies using multimedia, children are invited to watch films or videos related to persons with disabilities and then are invited to discuss what has been watched (Adlsbereshki et al., 2010; Godeau et al., 2010; Holtz, 2007; Stuart, 2006; in Lindsay & Edwards, 2013). In addition, with a multimedia approach children are not only invited to watch videos, but are also given simulations, presentations, discussions, and even direct contact with persons with disabilities (Clunie-Ross & O'Meara, 1989; Tavares, 2011; Watson, 2004; in Lindsay & Edwards, 2013). The results of this study indicate that the use of multimedia can increase children's knowledge about disabilities, as well as improve the attitudes and acceptance of children who are not disabled toward people with disabilities.

Several studies have shown the effectiveness of video use in influencing children's learning processes. Research conducted by Bandura, Ross, and Ross (1963) in children aged 3-6 years who are shown a video about aggressive behavior (Bobo doll) shows that children have more aggressive behavior during the testing phase (in Sims, 2013). In addition, Rice and Woodsmall's research (1988) which aimed to teach vocabulary to children aged 3-5 years through commercial television programs shows significant results especially in children aged 5 years who are better able to understand the vocabulary given through pictorial depiction (in Sims, 2013). In this case, children's ability to learn through screen media increases in preschool years because children are accustomed to using screen media, such as television or gadgets (Anderson & Hanson, 2010; in Sims, 2013). The development of a good ability of children in understanding the form of screen media, it makes children become better at processing information delivered through screen media content (Sims, 2013). Neeley and Schuman (2004) state that the existence of animated characters who are able to speak will tend to attract the attention of children. In addition, Krcmar, Grela, and Lin (2007) stated that the presence of bright colors, changes and movement of images that can often affect children's visual attention to the video. In the audio aspect, the presence of music in the video can make the child's attention visually to the screen media increasingly rejuvenated and make the child more focused (Krcmar, Grela, & Lin, 2007). This makes it easier for children to receive information provided through screen media.

In this study, animated videos are used to provide children the opportunity to learn about special needs people so their knowledge and behavioral intention are increased. Children in the early age have a limited cognitive ability, they have rigidity of thought that makes them can only understand something through the prominent characteristics of it (Miller, 2011). In this study, the prominent characteristics are using a wheelchair and hearing aids that can be seen by
children, are expected to make the children understand the concept of disability easier. Through animated videos with the characteristic of cartoon images, animated characters that speak, bright colors, music, frequent movement of images, and the children's ability to understand using screen because children are accustomed to using gadgets or watching television, the learning process is expected to be more effective (Krcmar, Grela, & Lin, 2007; Neeley & Schumann, 2004; Sims, 2013). The use of animated videos is expected to increase the knowledge about special needs people, especially in children aged 5-6 years. The children increasing knowledge about special needs children is expected to increase their tendency to interact and acceptance towards special needs children, especially their peers in inclusive kindergartens.

2. Methodology

This study is a quantitative research. In this study, the measured variables are the children's knowledge about disability and behavioral intention toward special needs children (using a wheelchair) in early age children. Furthermore, this study uses a non-experimental one-group pretest-posttest research design, where each individual in one group of participants is measured before and after treatment is given (Gravetter & Forzano, 2012). The purpose is to evaluate the effect of the intervention by comparing the scores obtained before and after the intervention was given to each individual in one research group (Gravetter & Forzano, 2012).

2.1 Research Location

This research was conducted at one of the inclusive kindergartens in the South Jakarta area. The consideration in choosing the location of this research is the phenomenon where children do not have sufficient knowledge and behavioral intention with special needs children happens in the school. Also, the school is open to accepting researchers to research the school.

2.2 Research Participant

Participants in this study were kindergarten students (TK A) aged 5-6 years old, attending inclusive kindergarten, not having disabilities, and following the whole series of studies conducted by researchers. Seven children took part in the entire study series from pre-test to post-test, 3 boys and 4 girls. Children watched animated videos for three days and were asked to fill in two measurements scale with guidances during pre-test and post-test. The measurement scales that used in this study were Children's Understanding towards Special Needs People Scale and Behavioral Intention Scale. Before participating in the research process, the participated children had received approval from parents through the distributed parental consent form.

2.3 Research Instruments

2.3.1. Children’s Understanding towards Special Needs People Scale

This scale aims to see the children's understanding of the conditions experienced by persons with special needs who use wheelchairs and hearing aids. Questions in this scale are developed in accordance with the information that will be given in the animated video and in the form of open questions to find out the children's response accurately. The Children's Understanding towards Special Needs People Scale consists of 6 items with a choice of answers 1 to 3, namely "Yes", "No", and "Confused". In the process, the questions will be read by the facilitator and the children will be directed to give a stamp on the response sheet. Examples of questions in the instrument are "why do people / your friends use wheelchairs?" And "can people / your friends who sit in a wheelchair be invited to play together?"

2.3.2. Behavioral Intention Scale

This scale aims to measure the children's desire to interact with special needs people. This scale was developed from the Behavioral Intentions Scale (BIS) used in the Hooser (2009) study. In this scale, several situations are given and describing children's daily activities, such as helping behavior, sharing behavior, physical closeness, general activity, and the level of closeness (Hooser, 2009). In the data collection process, children are shown pictures of special needs children using wheelchairs. The sex of the children in the picture is adjusted to the sex of the children and then the children are given the question "Will you ......?" Children are asked to respond
"Yes", "No", or "Confused" and then directed to give a stamp on the existing response sheet.

3. Result and Discussion
This study used the Wilcoxon Signed Rank Test non-parametric statistical technique. This statistical technique aims to compare pre-test scores obtained before the intervention and post-test scores obtained after the intervention to see if there is an increase in participants' scores before and after animated video about disabilities is given. Furthermore, a comparison between the score from the first post-test and the second post-test (conducted 2 weeks after the first post-test) was carried out to see the effects of the intervention after 2 weeks.

3.1 Knowledge about Special Needs People
Table 1 shows the statistical analysis result on children's knowledge about special needs people during pre-test and post-test 1 using the Wilcoxon Signed Rank Test non-parametric statistical techniques (Table 1).

Based on the statistical analysis results in Table 1, there is a change in the lowest score and the highest score obtained by participants in this study. In addition, the average value obtained is also increasing, namely 11.86 at the pre-test to 14.71 at post-test 1. Although there is an increase in the average score on the Children's Knowledge about People with Special Need, the significance score of the study \( p = 0.17 \) (\( p > 0.05 \)) that indicates that there was no significant change in the level of knowledge of children about special needs people before and after animated videos about disability were given.

Table 1. Statistical Analysis of Pre-Test and Post-Test 1 on Children’s Knowledge about People with Special Needs

|        | N | Mean | Standard Deviation | Significance |
|--------|---|------|--------------------|--------------|
| Pre-test | 7 | 11.86 | 2.85              | 0.17         |
| Post-test | 7 | 14.71 | 2.29              |              |

The increasing score of the children in this study after given animated videos about disabilities can be influenced by several factors. The first factor is the advantages of animated videos that can attract the attention of the children so the information can be conveyed and received easily by children (Johari, Hasan, & Rakhman, 2014). During the intervention process, the researchers observed that the children looked enthusiastic in watching the animated video. Using the animated talking character, bright colors, fast movements and changes, and music in the video make it attractive to the children and it is easier for them to understand all the information in the video (Krcmar et al., 2007; Neeley & Schumann, 2004).

The second factor is the repetition of the watching process that happens to the children where they watch it more than once. The results of research conducted by Skouteris & Kelly (2006) show that children are better at understanding the information conveyed in the video after the repetition of watching an animated video. In this research, the process of watching a video is done more than once. The video can be watched 3 times a day during the intervention process and there even one day that the children at their initiative ask to watch it again so they have watched it for 4 times on that day. The role of the researchers in providing understanding to the children in the debriefing process also help the children understand the information provided more easily so the children's knowledge about special need people are increasing.

The third factor is the prominent characteristics of the disabilities in the animated video characters, namely using a wheelchair and hearing aid. The prominent characteristics can help the children to understand the information in the videos. This relates to the cognitive abilities possessed by children at the kindergarten age (5-6 years), namely rigidity of thought that makes the children focus only on the prominent characteristics possessed by others (Miller, 2011).

The fourth factor is the children's ability to focus on the animated videos that have 2 minutes 15 seconds' duration. Some experts claim that children in the 5-6 years’ age range can maintain a focus on the activities they like for 10-15 minutes ("Q&A: What is a normal attention span? "2013).

Table 2 shows the statistical analysis result on the children knowledge about special needs people score in post-test 1 and post-test 2 using
the Wilcoxon Signed Rank Test non-parametric statistical techniques.

**Table 2. Statistical Analysis of Post-Test 1 and Post-Test 2 on Children's Knowledge about People with Special Needs**

|       | N  | Mean | Standard Deviation | Significance |
|-------|----|------|--------------------|--------------|
| Pre-test | 7  | 14.71 | 2.29               |              |
| Post-test | 7  | 13.71 | 3.77               | 0.5          |

Based on the results in Table 2, there is a change from the lowest score on post-test 1 and post-test 2, where the score is decreasing from 12 to 8. There is also a change in the average value's score of post-test 1 and post-test 2, where the score is decreasing from 14.71 to 13.71. The statistical analysis was carried out and showed that the significance value of the study was $p = 0.5$ ($p > 0.05$) which means there was no significant difference in children’s understanding of disability after two weeks after the animated video was given.

The decreasing score of the Children’s Knowledge about Special Needs People Scale can be influenced by the children’s inability to remember information provided through the animated videos about. The children’s incapability in understanding the information provided in the animated video can be the cause of this inability to remember (Miller, 2011). The children’s lack of focus or their poor health condition can also be the cause of this inability to recall the information from the animated videos.

**3.2 Behavioral Intention towards Special Needs**

Based on the results in Table 2, there is a change from the lowest score on post-test 1 and post-test 1, but there is no change in the highest score both in the pre-test and post-test 1. There are changes in the mean score from the pre-test and post-test 1, which is from 34.14 to 36.5. Although there was an increase in the mean score, the results of the statistical analysis showed that the significance value of the study was $p = 0.141$ ($p > 0.05$). This value indicates that there was no significant change in the children's behavioral intention towards special needs people before and after the animated videos about disabilities were given.

An increase in scores on the Behavioral Intention Scale after watching an animated video can be caused by several factors. Research based on the observation theory stated that children tend to imitate the behaviors they see on screen, both good and bad behavior (Christakis et al., 2013). The depiction of positive interactions in the animated videos between regular children and their special needs friends, such as playing together, helping to push the special needs children wheelchair, lending crayons, sitting together and sharing food while eating lunch, can encourage children to imitate the behavior. The additional knowledge about special needs people that the children acquired from watching the animated videos can also affect the children's judgment towards special needs people. This is in line with the assumptions from the reasoned action theory (Ajzen, 1985) which states that an individual behavioral intention towards something has a close relationship with the cognitive aspects of the individual, one of which is individual knowledge than one had.

Table 3 shows the statistical analysis result on the score of the children's behavioral intention to interact with special needs people during pre-test and post-test 1 using the Wilcoxon Signed Rank Test non-parametric statistical techniques.

**Table 3. Statistical Analysis Result of Pre-Test and Post-Test 1 on Behavioral Intention**

|       | N  | Mean | Standard Deviation | Significance |
|-------|----|------|--------------------|--------------|
| Pre-test | 7  | 34.14 | 6.39               |              |
| Post-test | 7  | 36.57 | 4.08               | 0.141        |

From the result in Table 3, it can be seen that there is a change in the lowest score on the pre-test and post-test 1, but there is no change in the highest score both in the pre-test and post-test 1. There are changes in the mean score from the pre-test and post-test 1, which is from 34.14 to 36.5. Although there was an increase in the mean score, the results of the statistical analysis showed that the significance value of the study was $p = 0.141$ ($p > 0.05$). This value indicates that there was no significant change in the children's behavioral intention towards special needs people before and after the animated videos about disabilities were given.

Table 4 shows statistical analysis results on the score of children's behavioral intention to interact with special needs people during post-test 1 and post-test 2 using the Wilcoxon Signed Rank Test non-parametric statistical techniques.

**Table 4. Statistical Analysis Result of Post-Test 1 and Post-Test 2 on Behavioral Intention**

|       | N  | Mean | Standard Deviation | Significance |
|-------|----|------|--------------------|--------------|
| Pre-test | 7  | 36.57 | 4.07               |              |
| Post-test | 7  | 37.57 | 1.9                | 0.414        |

Cite this as:
Hanifah Sabila, Farida Kurniawati. The Use of Animated Video to Increase Early Childhood Knowledge about Disability and Their Behavioral Intention toward Disabled Peers. Indonesian Journal of Disability Studies (IJDS).2020: Vol. 7(1): PP. 72-80.
Based on the results in Table 4, there is a change in scores of behavioral intentions from post-test 1 to post-test 2 on the lowest score which increased from 28 to 35. The highest score of behavioral intention at post-test 1 and post-test 2 did not change but remain stable at 39. There is also a change in the mean score from post-test 1 to post-test 2, from 36.57 to 37.57. However, despite there is an increase in the average score from post-test 1 to post-test 2, the results of the statistical analysis showed that the significance value of the study was $p = 0.414$ ($p > 0.05$). This significance value indicates that there is no significant difference in children's behavioral intention to interact with people with special needs people after two weeks of watching the animated video.

Children whose Behavioral Intention Scale score is decreasing also have their score decreasing on the Children's Knowledge about Special Needs People Scale in post-test 2. This led to an assumption that a decrease in the level of children's knowledge about special needs people has a connection with the decreasing in their behavioral intention to interact with special needs people because children have limited knowledge related special needs people, such as how to interact or the types of games that can be done with special needs children.

In addition, the decline in scores experienced by children on the Behavioral Intention Scale can also be caused by the different information that the children receive from their environment. For example, the children's parents' opinions or negative comments made by the children's parents towards special needs people. The different information background can make the children experience disequilibrium, where the new information that they received by watching the animated videos can change their judgment towards special needs people and make them confused so their tendency to interact with special needs people are declining.

Changes in children's scores on the Behavioral Intention Scale in post-test 2 can also be caused by the experiences that children have over the two weeks' period. The children can meet special needs children in the 2 weeks’ period and have a positive experience with them. Armstrong, Morris, Abraham, Ukoumunne, & Tarrant (2016) state that the number or frequency of the children interacting with special needs children have a positive correlation with the children's judgment or attitude towards special needs children. In this case, the children's positive assessment or attitude towards special needs children correlate with their intention to interact with special needs friends in a free play setting (De Boer, Pijl, & Minnaert, 2012). The children's experience interacting with special needs children can affect their assessment to be more positive towards special needs children and this makes the children's scores on the Behavioral Intention Scale increased. Vice versa, a decrease in scores experienced by children on the Behavioral Tendency Scale can be caused by negative experiences that children may experience when meeting or interacting with special needs children during the 2 weeks’ interval to post-test 2. These negative experiences make the children feel less interested to interact with special needs children.

4. Conclusions

From the analysis results, it can be concluded that there is no significant difference in the knowledge of the children about people with disabilities before and after animated videos about disabilities are given with the significance value of the study was $p = 0.17$ ($p > 0.05$). Insignificant result was also revealed from the behavioral intention of children aged 5-6 years towards people with disabilities before and after animated videos about disabilities are given with the significance value of the study was $p = 0.141$ ($p > 0.05$). In addition, after 2 weeks of intervention, there were no significant differences in children's knowledge and behavioral intention toward people with disabilities with the significance value were $p = 0.5$ ($p > 0.05$) for the children’s knowledge about disability and $p = 0.414$ ($p > 0.05$) for the behavioral intention of children aged 5-6 years towards people with disabilities. Even though the statistical test did not show any significant changes, there was an increase in scores held by some children after watching an animated video about disabilities. This shows that animated video interventions can increase children's knowledge and behavioral intention toward special needs. This result can last even after 2 weeks of intervention.
There are several recommendations that are recommended based on the results of this study, namely the number of samples involved in the study should be greater and comes from different schools so that the results of the study are more representative of the actual conditions. Next is to consider more than one type of disability in the data collection process so that the research results obtained have a more complete picture. In this study, the types of disabilities that were introduced were only the types of disabilities that were physically visible, namely the types of physical disabilities (using a wheelchair) and sensory hearing loss (using hearing aids). The next suggestion is that the use of video animation can be used as a learning process in the classroom, especially in introducing disability in inclusive schools. The limitations of persons with disabilities that can be accepted in inclusive schools in Indonesia make children's experience and knowledge about people with disabilities still limited. This shows the need to provide learning experiences for children about other types of disabilities, especially through animated videos.

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