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Designing Children Picture Book Themed Empathy for High Function Autism Classmate
Digital Field-Testing Method as Design Ethnography

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ABSTRACT

ASD (Autism Spectrum Disorder) is a pervasive developmental disorder that usually affects poor communication and low interaction with the surrounding. The data shown, ASD has increased by 500 people/year in Indonesia. High-function ASD who studied in inclusive/integration school often bullied (a chance 63% higher than the normal). Bullying and others aggressive attitudes, correlate with one's low empathy, can be prevented by enhance empathy and understanding others through Picture books. This media help children empathize with ASD characters, plots, and values in a fun and understandable way. The research aim is to evaluate the prototype of ASD Children Picture Book. It involves character, plot, layout, setting, and also the main value which are the main aspects to be tested. Digital Field Testing method as Design Ethnography aimed for gaining feedback from Children Reader. This method uses the Zoom platform to deliver Picture Book's content. The Readers are 5 children of 2nd and 3rd Grade Elementary School in Bandung. The result shown that mostly Children can distinguish 3 ASD characters throughout the story. Children felt empathetic response to Dio character and its ASD difficulty. Most children think ASD is some hard-talking sickness. Caregiver/Teacher needs to open discussion about general ASD character to avoid stereotyping and lead to neuro-diversity thinking. This research benefits understanding the context of ASD Picture Book in online reading.

Keywords: Picture Book, Autism, Digital Field-Testing, Design Ethnography.

1. PICTURE BOOK THEMED EMPATHY FOR ASD HIGH FUNCTION

All children are born special, whether physically complete or not, whether with more or less intelligence, including children with developmental disabilities. The implementation of inclusive schools for Children with Special Needs should create a comfortable environment for education. It was found that the tendency of inclusive school bullying and the integration of children seemed quite "odd" to the bully who had a very high chance of becoming the object or victim of bullying. Bullying a friend can be a joke if it doesn't hurt the person being bullied either physically or mentally. Actions that include bullying are: isolating, demeaning, or even bullying (forcibly asking for money) against ordinary children or with special needs [1]. ASD is a 63% higher chance of getting bullied than a normal child. For bullying in both education and social media, the number reached 2,473 reports and the trend continues to increase [2]. The Indonesian Child Protection Commission (Komisi Perlindungan Anak Indonesia/KPAI) noted that 107 children were victims of bullying at schools in 2018 [3].

ASD is a pervasive developmental disorder (Pervasive Developmental Disorder) in the form of communication disorders, social interactions, sensory disturbances, play patterns, behavior, emotions, interests, limited movement, stereotypes, repetition, and disorders of neurobiological development [4],[5]. In this study, the word ASD was used to refer to autism spectrum disorders, including Asperger's syndrome, Pervasive Developmental Disorder/PDD,

Rett syndrome, and others involving movement, sensory, communication, and special learning methods [6]. ASD high function shows eye contact even though it doesn't last long and can give a little response when called by name, shows facial expressions, and can communicate in two directions even though it happens only occasionally [7]. This research will aimed to evaluate the designed picture book whether it promote empathy toward children with ASD through its story and illustration.

Bullying (aggressive nature) is correlated with low empathy, especially towards the victim. Previous research data have shown that both visual and verbal narratives can increase children's empathy for characters [8].[9],[10],[11]. There has been no specific research related to children's empathy for visual narratives: plot, characters, values from ASD-themed picture books. So this study seeks to fill in the gaps that have not been studied by previous researchers.

1.1. Picture Book themed ASD

Literacy learning through Picture books (children's books/comics), invites children to empathize in the form of fun texts and visuals. The function of the picture book according to Mitchell [12] is to help children's emotional development and learn about other people and the relationships that occur in the narrative.

Children empathize with picture books through the narrative visual-text and learn about characters with teachers/parents [12],[13]. Picture books enhance comprehension of context with visual dominance[14]. Children become readers, obtain delight and wisdom without reading the text [15]. The characters and scenes that make up the plot built the text-visual narrative. A typical plot in children's literature follows a pattern: home-going-from-home-adventure-back-home [16]. The characters in the narrative play an important role in determining the attractiveness of the picture book.
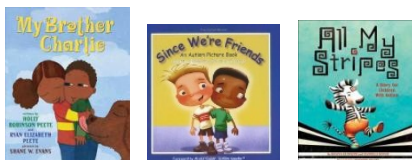

Figure 1 ASD-themed Picture Book. (left side) My Brother Charlie/MBC (Peete 2010); (middle) Since We're Friends/SWF (Shally 2012); (right side) All My Stripes/AMS (Rudolph dan Royer 2015). (Source: personal documentation).

There are earlier studied regarding visual suggestions of ASD themed Picture Book. The books being studied are: 'My Brother Charlie,' 'Since We are Friends,' and 'All My Stripes'. Meanwhile the visual suggestion are: long shoot angle, a front view, an enlarged scale, 3:2 background-characters composition, a hairline /unlined line, and contrast color, all dominated books [17].

There is also a plot, setting and character suggestion. The plot is expected not to give the impression of being sad or tragic for ASD children and the need to show support from people around ASD characters. Children tend to empathize with settings that are familiar to them, namely school settings and home settings. Good ASD book introduces at least 3 ASD characters based on DSM-IV (Diagnostic Statistical Manual of Mental Disorder-IV), such as: not looking directly, difficulty making friends, difficulty communicating, disliking noise, and likes to do certain things over and over again [17].

2. DIO PICTURE BOOK

The visual design suggestions for the ASD picture book maintain informative visual depictions such as long shoot angles, front views, enlarged object scales, 3: 2 background-characters composition, using hairline / unlined lines, and contrast color. Compositing it in a wimba way promotes imagination, such as the inner expression system that states space-time. All three books give characteristics to all three categories of ASD by DSM-IV, namely: difficulties in social interaction, language difficulties, and repetitive patterns of behavior.

The use of picture books in online classes has several things to note. Offline and online picture book reading should show large, clear pictures, vocabulary, and sentences suitable to the child's reading ability, intonation, facial expressions, and gestures. Delivering the ASD theme *picture book* needs to pay attention to ASD referring, general characteristics of ASD, and individual uniqueness.

Figure 3 Dio's Picture Book Cover (left) and Story Plot (right).

Figure 2 International ASD band emblem, Source: autismsociety.org

Dio's book tells about Dio's ASD that does not prevent him from excelling and overcomes the problem of bullying at school. This book attempts to convey appreciation and empathy towards friends with neurodiversity such as ASD. It is depicted that Jesi's character also supports the story by paying attention to what happened and finally playing with Dio.

3. FINDING AND RESULT: ONLINE FIELD TESTING ON DIO PICTURE BOOK

This study uses a qualitative-field research approach with a Design-based Research (DBR) design model. Qualitative Approach – Ethnographic researchers seek to establish the meaning of a phenomenon from the participant's point of view [18]. Field research (ethnography) is qualitative approach, rooted in cultural anthropology. This research approach relies on the researcher engaging in direct observation of people in their natural environment to understand participant's perspective [19].

The Field Testing method is a modification of the field-research method that has been used by the Room to Read community in testing books designed for children [20]. This study involved 10 children in grades 2-3 elementary school. They were asked to read Dio's book via Zoom apps for a duration of 15 minutes. After reading, the child will be asked some questions. This study involved 2 researchers who acted as participatory and non-participatory observations. The data were evaluated through notes of difficult words and resulted in the percentage of successful reading of all the words in the book (95-100% readable; 80-95% difficult words in an appropriate number; under 80% difficult). Through question-and-answer questions, feedback was obtained about the characters, plot, and values regarding Dio's book.
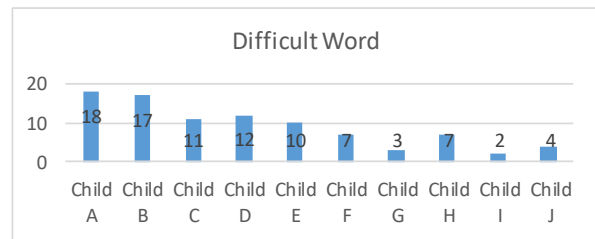

Figure 4 Graph of Children Difficult Word, Field Testing Method data.

Dio's book consist of 254 word. Child A (F/8yo) 18 difficult words; Child B 17 difficult words and Child C 11 difficult words. From these data, the average percentage of reading difficulties is 0.59%. So that readings based on text can be categorized as readable with a reading success percentage of 94.1%.

In second field-testing the result are Child D(M/8yo) 12 words, Child E(F/8th) 10 words, Child F(M/9yo) 7 words, Child G(M/9yo) 3 words, Child H(F/9yo) 7 words, Child I(F/9yo) 2 words, Child J(F/9yo) 4 words. From these data, the average percentage of reading difficulties decreased to 0.26%. So that readings based on text can be categorized as readable with a reading success percentage of 97.38%.

3.1. Character

Figure 5 Dio's Character (left, second left) and Jesi Character (right, second right)

Of the 10 participants, 7 children stated that they liked Dio's character while 3 others liked Jesi's character. As for the characters they don't like, 6 people chose the red character, 3 people chose the green character and 1 person didn't answer. Children tend to like protagonists and other childhood

characters. This is because children are easier to empathize with when the character has something in common with him in addition to the characteristics of the character. In the story, apart from Dio, Jesi, the red character, and the green character, there are also Papa-Mama characters, doctors, teachers and 2 other friends.

From the results of the field-testing, the children were able to give the characteristics of ASD to Dio with the following characteristics (many children were able to mention): difficulty speaking (10/10); sensitive to loud sound (5/10); playing alone (7/10). For more detailed characteristics such as echolalia (repeating words), rigidity of expression, lack of reciprocal social and emotional relationships, children are not easily caught by children.

3.2. Story Plot, Layout and Setting

Figure 6 Before (left) and After (right) setting revision

From the results of the first Field Testing, reading and comprehension difficulties were also found on pages 24-25. In the original picture, the child doesn't understand why there are numbers and why Dio's character says 'inhale, exhale'. This is a psychologist's advice to relieve anger before doing something out of control. It's best to have a nose before trying to do or say something. Then the visual code of Dio's face is given into 3 stages of changing his face from angry to calmer.

Figure 7 Before (left) and After (right) illustration revision

Children also tend to skip reading numbers 1-10. So in the repair the number is changed to be smaller and given a reading flow with 'text'. Indeed, the children did not immediately understand the meaning of counting and breathing to relieve anger, but they did catch that Dio was experiencing emotional changes.
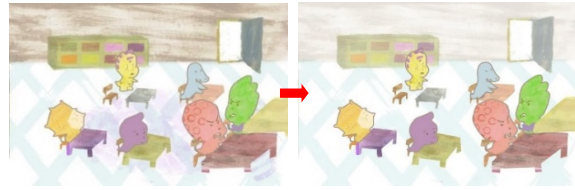

Figure 8 Before (left) and After (right) background revision

Then it was found that the contrast was not good in the classroom texture which 'disturbed' the visual harmony. So on the following page the texture of the classroom walls is fixed. The top two images on pages 14-15 and the bottom two images on pages 16-17.

In the setting section, children are asked to guess the description of the setting. As a result, all children were able to answer correctly whether the character was at home or at school. They are also able to name items that support the setting. The s tting of the house is described starting from the garden and inside the house (room). Then at school. The school yard is marked by a flagpole, a building, a football field. In a classroom atmosphere, visual cues are in the form of tables, chairs and cupboards. Familiar settings (home and school) help the overall story to focus on the plot and characters.

Children are also asked to guess the emotions of the characters in 6 pictures with the most contrasting emotions of the characters between happy emotions (page 1, page 26), conflict (page 10-11), sadness (page 19, page 20-21) and anger (page 26). The story text is not explicitly told about emotions such as the words: "I feel angry" or "I feel sad". All emotions are shown through visual power (color, layout, setting) and character expression. The results of field testing stated that the child was able to correctly guess the 6 emotions shown by the character. Children can also feel the emotional transfer of characters from scene to scene. There is an attempt by the child to feel what the character feels so that it can be said that the child shows an empathetic response to the Dio character.
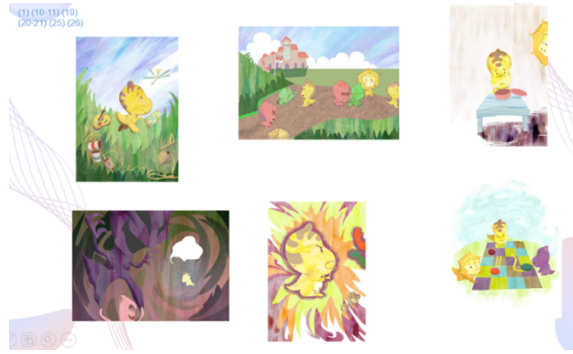
Figure 9 Character emotion. Happy (top left), angry-confuse-normal (top center), sad (top right), angry and sadness (below left); angry (below center); happy (below right).

The most liked scene in Dio's story, 4 out of 10 children, chose the ending scene when Dio played with friends. The children stated that they were happy that Dio was feeling better and could play together. Then 3 children out of 10 said they liked the scene when Dio was lied to go to the teacher's room. They stated that they remembered playing pranks on their friends. While the other 3 children choose different scenes based on certain objects they like in the picture. Through this response, it can be concluded that 7 out of 10 children liked the story part because they understood the plot, while the other 3 children liked the story part because the visuals were apart from the story plot.

Figure 10 Dio was lied to go to the teacher's room (left) and the ending scene when Dio played with friends (right).

3.3. Value

The values contained in Dio's book with the ASD theme can be viewed in various ways. Children can see the positive value contained in the story or see the value of the story based on the ASD theme 5 out of 10 children stated that the book was about Dio and autism. These five children tend to focus on Dio's ASD. Meanwhile, the other 3 children stated that they saw the value of struggle, never gave up, wanted to learn from Dio's figure with his ASD barriers. The other 2 children also viewed Dio as a character who was independent and dared to express his opinion. So that this book can be said to have been able to convey the theme of ASD and ASD figures with the value of neurodiversity awards.

Children can easily state the problems faced by Dio's character, which is the main theme of ASD books. Children tend to view ASD as a disease of speech difficulties. This conception is not quite right, besides being easy for children to understand. The need to provide more ASD-themed books with a variety of autistic spectrum characters in order to avoid stereotypes of ASD children.

Tabel 1. ASD Characteristics

Disorder Group	ASD Characteristic
Qualitative disorders in reciprocal social interactions must have at least two characteristics	• Inability to establish adequate social interactions: lack eye contact, poor eye expression, poorly directed movements. • Unable to feel what other people feel • Lack of reciprocal social and emotional connection
Qualitative disturbances in the field of communication as pointed out by at least one feature	• Talking late or not developing at all (not trying to compensate for communication in other ways without speaking) • Often uses strange and repetitive language
The existence of a pattern that is maintained and repeated in behavior, interests, and activities must have at least one characteristic	• Before the age of 3 years, there appears to be a delay or disturbance in social, speech, and language, and a monotonous, less varied way of playing not due to Rett syndrome or childhood disintegrative disorder

4. DISSCUSSION AND CONCLUSION

Dio picture book proved by digital field testing can promote emphatic response from Child toward Dio character, Jesi character and its story. Dio's Book Field Testing for 10 children gave an average percentage of reading difficulty level of 0.26%. So that readings based on text can be categorized as readable with a reading success percentage of 97.38%.

The result is shown in the book's feedback in 1. Character, 2. Setting, Plot, and Layout, 3. Value. First, most children can distinguish 3 ASD characters throughout the story such as speaking difficulty, sound sensitivity, and prefer to play alone. For character emotion described in the story, all children can guess the emotion after reading the story. The emotions of 6 picture shown are: happy (page 1 when Dio play in the garden), angry-confused-normal (page 10-11 when a friend fall and Dio does not help him), sad (When classmate eat Dio's lunch), sad and angry (When Dio is being bullied), angry (when Dio is annoyed and speak bluntly to the bully).

Second, for Setting, Plot, and Layout, there are some layout improvements in the setting transition and emotional transition. There is a need for dimensional similarities in setting transitions and visual cues that signify the two places (home and school). Emotional transitions require visual aids depicting 3 faces: angry, slightly annoyed, normal.

When asked the most favorite scene in the story, there are two tendencies of the answer. The first answer, 7 out of 10 children like the story part because they understand the plot of the story. 4 out of 7 children liked the ending scene when Dio felt better and played together, 3 out of 7 children liked the scene when Dio was being deceived. The second answer, the other 3 children liked the story part because the visuals were apart from the story plot. The other 3 children chose based on a particular object they liked on the drawing page.

Third, the value contained in Dio's book with the ASD theme produces 3 views. First, 5 out of 10 children stated that the book was about Dio and autism. Second, the other 3 children stated that they saw the value of struggle, never gave up, wanted to learn from Dio's figure with ASD barriers. Third, 2 other children view Dio as a character who is independent and dares to express his opinion. So that this book can be said to have been able to convey the theme of ASD and ASD figures with the value of neurodiversity awards.

Children can easily state the problems faced by Dio's character, which is the main theme of ASD books. Children tend to view ASD as a disease of speech difficulties. This conception is not quite right, besides being easy for children to understand. The need to provide more ASD-themed books with a variety of autistic spectrum characters in order to avoid stereotypes of ASD children. It is highly recommended to use a variety of ASD books with

ASD characters that have a different spectrum to broaden the view and avoid stereotypes.

AUTHORS' CONTRIBUTIONS

This research can be developed to find out the relationship between children's comprehension and empathy towards a picture book with the theme of ASD mental disability. Research using the field-testing method also opens up opportunities for picture book research related to language skills, psychology, children's relations with the media, illustration, design, and visual language.

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