



Thinking the most convenient analysis of alpha generation by using social science story digital books

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Abstract: The low literacy of students in Indonesia was the center of attention for all observers of present-day education that have an effect on the alpha generation as their successors. Overcoming these problems, it was necessary to innovate and develop social science story digital books for the alpha generation in industrial revolution 4.0 era that needs to be realized in the real life of students as the purpose of this study. Development research was carried out with the development model of Borg & Gall, namely: research and information collecting, planning, develop a preliminary form of product, preliminary field testing, main product revision, main field testing, operational product revision, operational field testing, final product revision, and dissemination and implementation. The results showed that the develop social science story digital books with the design of the Adobe Photoshop CS6 for an alpha generation was feasible and effective to use.

Keywords: Science social, story, alpha generation, industrial revolution 4.0, literacy, elementary school

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INTRODUCTION

Indonesia has experienced major problems based on the results of previous studies related to the provision of reading materials that are of interest to the alpha generation in the era of industrial revolution 4.0. Alpha generation is the children born since 2010 (McCordle, 2014; Tootell, Freeman, & Freeman, 2014). Those born globally from 2010-2024 (McCordle, 2014; Victoria Turk, 2017). The alpha naming is based on the Greek alphabet, and according to the alphabet, Alpha was chosen because the generation that was born before has used the name Generation Z (Nagy & Kölcsey, 2017). They are called alpha generation because they are not the end of the old or recycled current, but the beginning of something new (McCordle, 2014). Around 2.5 million Alfa Generations are born every week in the world (Augusto et al., 2018). By the time Generation Alpha start to enter their 20s (2030s) they will be in unprecedented demand as workers (McCordle, 2014).

Problem analysis from the results of previous research shows that several problems were found. First, the storybook presented to the children of the alpha generation 4.0 industrial revolution era is still not experiencing renewal (Levine, 2018; Russ & Berland, 2018). Second, the presentation of stories is less creative and easy to guess in the storyline (Hawley & Sinatra, 2018; Jaber & Hammer, 2015; Nixon, Smith, & Sudweeks, 2018). Third, social science stories are very rarely presented to alpha generation children, even though they help the reasoning and critical thinking of alpha generation students (Acar, 2018; Cole & Packer, 2016). Fourth, most children's stories still tell stories that have not touched a renewal that is far from developing technology (Archer et al., 2016; Vosniadou & Skopeliti, 2018).

The preliminary analysis findings show that the classic social science storybook has not yet developed. The content is monotonous and predictable. Presentation of classic social science stories still uses images with a choice of colors and designs that are less attractive to children. Gradations of color in the story illustrations still do not pay attention to children's interests. The

classic social science story still teaches the characters at the end of the story. Whereas character building can be done at the beginning, middle, and end of a story. The classic social science stories in Indonesia also haven't taught and haven't trained children to think critically.

One solution that can be done to improve the literacy of alpha generation in the improvement of social attitudes to science in the industrial revolution era 4.0 is to research the development of literacy digital reading books using the social story of the alpha generation of the industrial revolution era 4.0. The specific objective to be achieved in this study is the realization of innovation and the development of reading literacy digital-books using the social science story of the generation of alpha in the industrial revolution era 4.0 that needs to be realized in the real life of students. Specifically, the purpose of this study is literacy digital reading books using social science stories that are valid, practical, and effective for the alpha generation of the industrial revolution era 4.0.

The urgency of the research on the development of literacy digital reading books using the social story of alpha generation science in the industrial revolution era 4.0, namely: First, literacy is one of the new studies in Indonesia in measuring the level of students' understanding of the contents of the reading. Literacy of Indonesian students in the world is low ranked. Literacy will be able to invite elementary school students to be active and be directly involved with the contents of the reading itself. Second, familiarize elementary students to act and think critically. Students will be trained to have critical reasoning in facing real life in the era of industrial revolution 4.0.

METHOD

The research carried out was a mixed method with the type of development. The mixed-method research method was chosen to be carried out because the research produced a ready-to-use product, the social science storybook. Qualitative data analysis and quantitative data analysis were needed to produce the latest social science storybook following the needs of the alpha generation. The research and development model used Gall, Borg, and Gall. The steps of Research and Development are applied (Gall, Borg, & Gall, 2003), which are as follows: (1) Research and information collecting, namely analyzing the needs of alpha generation social science storybooks. (2) Planning, which is planning the making of a general framework of the resulting story. (3) Develop the preliminary form of product, which is to produce a draft of a social science story that is ready to be used for testing. (4) Preliminary field testing, namely validating social science storybooks to 11 experts and testing draft research products to alpha generation with one to one method and small group evaluation. (5) Main product revision, which is to revise the prototype of the social science storybook based on the results of the tests conducted. (6). Main field testing, which is testing the social science storybook product of the first revision in elementary school. (7) Operational product revision, which is revising social science storybooks based on information and input from elementary school children, teachers, and school principals. (8) Operational field testing, which tests social science storybooks to determine the practicality of the use of books by alpha generation children. (9) Final product revision, which is revising the social science storybook product so that the product shortage when the practicality test does not appear in the next trial. (10) Dissemination and implementation, namely the testing of social science storybook products to determine product effectiveness data using the Quasi-Experimental method with Nonequivalent Control Group Design. The research data was obtained from the results of data triangulation, namely interviews, observations, and field notes. While quantitative data are collected through the results of questionnaires, observation sheets, and test results.

Participants in this study were fourth grade students in elementary schools in Indonesia. The trial was conducted in the province of West Sumatra. At the Research and information collecting stage, researchers conduct data collection or information stages to determine the needs in the learning that will take place. Things that are considered in determining learning needs such as school learning conditions, the potential of the school, and analysis of the curriculum with literature studies and field studies. In the Planning stage, the purpose and

benefits of making digital literacy books and the preparation of research instruments in the form of validation sheets and questionnaires were carried out. The stage of developing a preliminary form of product prepares material, namely social science stories and designing social science-based learning sources. The preliminary field testing stage is validated by linguists, science experts, and social experts. The stage of product revision is performed to get a good literacy reading book before the field trial is carried out. The main field testing phase was carried out by individual trials of 3-5 respondents, while limited trials were carried out in 10-15 respondents. The operational product revision phase was carried out after conducting individual trials and limited trials, the trial results were used to make improvements. The operational field testing phase was carried out by field trials to 30-36 respondents. Field trials are conducted to find out how much attractiveness the product is made. The final product revision stage is done by finishing the final product. The dissemination and implementation phase produced literacy digital reading books as a source of learning alpha generation packed in CDs that are ready to be used to support learning.

RESULTS

Digital books of science social stories are companion books in the form of stories that contain social and scientific material and integrate character education. Stories are presented using settings and situations that are close to the child, namely in school, home, or the natural environment and occur during school or vacation. The story figure is an elementary school kid. Background taking in the natural environment is done to bring children closer to their environment so that it is easier to teach and exemplify the character of environmental care through the portrayal of backgrounds and characters. The content of science in the story is presented in the form of events that occur and are found in the storyline. The story is one way to enter the child's world so that there is an understanding, mental, and emotional involvement between those who tell the story and the recipient of the story.

Illustrations of the digital-book on social science stories are designed using the Adobe Photoshop CS6 Program. The colors used are following the actual environmental conditions by combining the right color gradations and lighting that is appropriate to the conditions in the social science story. Illustrations or images include bright colors with good quality, large enough, not abstract, not creepy and clear differences for children between illustrations of male or female figures. An example illustration of some social science stories can be seen in Figure 1.



FIGURE 1. Illustration of several story titles in the designed social science storybook

The developed scientific social story digital book consists of 20 stories. The initial part of each story is equipped with indicators based on the scope of development of elementary students, to provide clear information about the objectives to be achieved. The social contents of science stories are complemented by simple experiments that can be done by students with the help of teachers or parents. The science material presented includes the concepts of gravity, color mixing, the use of magnifying glass, ecosystems, food chains, floating, drifting, and sinking, changes in matter, and series and parallel electricity. The final part of each story is equipped

with exercises and evaluations to measure students' mastery of the material presented. In the end, there is additional information about student character development following the mandate in the story. The arrangement of digital science social storybooks meets the requirements of good teaching materials because they are equipped with achievement indicators, simple experiments, exercises and evaluations, and additional information. Six components of good teaching materials are learning instructions, competencies to be achieved, supporting information, exercises, work instructions or worksheets, and evaluation.

The process of making a digital book of social science stories begins with an analysis of the demands of the competence of elementary school students in the learning content of the fourth grade of Natural Sciences and Social Sciences. Stories are designed with advanced flow and social conflict. After completing the story, illustrated each story. Illustration of the story is done by reading and understanding the climax part of the story so that it is easily converted into the language of images. The activity continued with determining the character of the character to be developed in the story. Then proceed with making a manual sketch using drawing tools, pencils, and erasers. Then thicken each drawing line using a pen. The resulting image is scanned using a scanning computer. Next, change the manual image to JPEG format on the printer scan program. Then open the illustrated JPEG file using the Adobe Photoshop CS6 program to adjust the color of the paper to clean the manual scan results, create two layers in the illustration image that will be colored by adjusting the manual scan results, creating a New Layer to activate the coloring layer, selecting fields the image will be colored, coloring the selected image field, and coloring the image area that requires smooth gradation.

The social science digital books that have been designed using the Adobe Photoshop CS6 Program are validated by 12 experts to test the feasibility of digital social science storybooks. Validation of digital books on social science stories is carried out on several aspects, namely aspects of the feasibility of content, language, and graphics. The aspect of content eligibility consists of five parts, namely (1) Conformity with student development. (2) Science literacy content. (3) The storyline in the book matches the logical learning path and moral development. (4) Books fulfill social material. (5) Books fulfill science material. Overall the results of the validation of digital science storybooks containing elements of literacy can be seen in Table 1.

Table 1. Results of validation of digital books on science social story

Number	Observed Aspects	Value	Category
1.	Content Feasibility	3,93	Very Worthy
2.	Linguistics	3,62	Very Worthy
3.	Graphics	3,92	Very Worthy
	Average	3,82	Very Worthy

Based on the results of the validation for the feasibility test of social science storybooks, it was obtained data that it was seen that the social storybook of science in terms of the feasibility of content, language, and graphics was declared feasible. Contents of the content of social science storybooks show stories that care about social and easily discuss science. The language used is easily understood by fourth-grade students. While the image illustration in each story already represents the overall story content.

The results of the social science storybook validation were revised based on expert opinion. The revised results were used for trials at 01Kampung Olo Public Elementary School, Nanggalo District, Padang City, West Sumatra Province, Indonesia. The trial results of the use of social science storybooks were carried out in Class IV-A of 01 Kampung Olo Public Elementary School, Nanggalo Subdistrict, Padang City, West Sumatra Province, Indonesia showed that Class IV-A of SD Olo 01 was used as an experimental class, while class IV- B Kampung Olo 01 Elementary School is used as a control class. The learning process in Class IV-A 01 Elementary School in Kampung Olo uses illustrated science social storybooks, while the learning process in class IV-B 01 Kampung Olo Public Elementary School uses social science storybooks without illustrations and intellectual intelligence of students. The influence of illustrated social science

stories and social science stories without illustrations of learning motivation and student character development can be seen in the following two-way test Table 2.

Table 2. *Tests of between-subjects effects*

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	Learning Motivation	5146,690 ^a	5	1029,338	5,116	,001
	Character	5313,714 ^b	5	1062,743	10,916	,000
Intercept	Learning Motivation	187868,595	1	187868,595	933,674	,000
	Character	225573,429	1	225573,429	2316,968	,000
Social_Science_Story	Learning Motivation	924,024	1	924,024	4,592	,039
	Character	1173,429	1	1173,429	12,053	,001
Intellectual_Intelligence	Learning Motivation	3630,333	2	1815,167	9,021	,001
	Character	3691,857	2	1845,929	18,960	,000
Social_Science_Story * Intellectual_Intelligence	Learning Motivation	592,333	2	296,167	1,472	,243
	Character	448,429	2	224,214	2,303	,115
Error	Learning Motivation	7243,714	36	201,214		
	Character	3504,857	36	97,357		
Total	Learning Motivation	200259,000	42			
	Character	234392,000	42			
Corrected Total	Learning Motivation	12390,405	41			
	Character	8818,571	41			

a. R Squared = ,415 (Adjusted R Squared = ,334)
b. R Squared = ,603 (Adjusted R Squared = ,547)

Based on Table 2, it can be determined that (1) significant values indicate $0.039 < 0.05$, then there are differences in Learning Motivation based on Social_Science_Story used. (2) the significant value indicates $0.01 < 0.05$, so there is a difference in Character based on Social_Science_Story used. (3) significant values indicate $0.01 < 0.05$, there are differences in Learning Motivation based on Intellectual_Intelligence. (4) significant values indicate $0.00 < 0.05$, there are differences in Character based on Intellectual_Intelligence. (5) a significant value of $0.243 < 0.05$ so there is no difference in Learning Motivation based on interaction effects. (6) significant value shows $0.115 < 0.05$ so there is no difference in Character based on interaction effects.

DISCUSSION and CONCLUSION

The results of the study showed that the designed social science books digital stories were able to direct students to actualize positive social attitudes and increase students' motivation to learn science. The social science story referred to in the study, which is a story that combines social relations with science which is called science fiction (D'Agostino, Rodgers, & Mauck, 2017; Rodgers, Agostino, Harmey, Kelly, & Brownfield, 2016; Schüller, Birnbaum, & Kröner, 2016). Fiction can be seen as a social phenomenon in the community (Blanton, Wood, & Taylor, 2007; Gürçay & Baron, 2016; Rodgers et al., 2016). Good fiction can remind, awaken, and restore humanity to the proper path, namely the path of truth to fulfill the tasks of life (D'Agostino et al., 2017; Dreher, 2016; Pradhan & Singh, 2016). Fiction has elements in the form of thoughts of experience, ideas, feelings, enthusiasm, beliefs (beliefs), expressions or expressions, forms, and languages (Dreher, 2016; Lund, Braten, & Brandmo, 2018; Pradhan & Singh, 2016). Storytelling is the right method of fulfilling needs because in the story there are values that can be developed (Farsides et al., 2017; Gürçay & Baron, 2016; Pradhan & Singh, 2016). Storytelling turns out to be an effective way to develop children's knowledge, feelings, social, and conative aspects (Beker, Broek, & Jolles, 2018; Blanton et al., 2007; Rouse & Fantuzzo, 2006; Svedholm-häkkinen & Lindeman, 2017).

The social science story developed tells the story of children who are in the natural environment with the insights of science they have (Bächtold & Munier, 2018; Marco-Bujosa, McNeill, & Friedman, 2019; Rodgers et al., 2016). The story is designed according to the concept of Natural Science itself (Baumfalk et al., 2018; Bellocchi, 2018; Krist, Schwarz, & Reiser, 2018). Natural Science is the whole way of thinking to understand the phenomena of nature, as a way of

investigating natural events, and as a stem of the scientific body obtained from an investigation (Bächtold & Munier, 2018; Chin et al., 2019; Kim, 2018; Krist et al., 2018; Levine, 2018; Mckenney, 2017; Neill, 2016; Ruiz-Gallardo & Reavey, 2018; Ryoo & Bedell, 2018; Winarti, Yuanita, & Nur, 2019). The results of developing social science digital books with illustrations using color gradations favored by alpha generation teach young readers to think analysis with the most comfortable conditions. The style of language used in social science stories has been adjusted to the level of development of the reader (Dreher, 2016; Levine, 2018; Lund et al., 2018; Pradhan & Singh, 2016). The target audience is planned, namely children aged 6-12 years who are in elementary school. Elementary school children (6-12 years) have been able to react to intellectual stimuli or do learning tasks that require intellectual ability or cognitive abilities, such as reading (Gutiérrez & Jurow, 2016; Horn, 2018; Rienties, Tempelaar, & Rienties, 2017; Sawyer, 2017; Smirnov, Easterday, Gerber, & Gerber, 2017; Sosa, Hall, Goldman, & Lee, 2016; Thadani et al., 2017; Turner et al., 2017).

Social science stories teach students to think scientifically and have social attitudes that are commendable in the community (Acar, 2018; Craig & Marshall, 2019; Mckenney, 2017; Rienties et al., 2017; Russ & Berland, 2018; Thadani et al., 2017; Vosniadou & Skopeliti, 2018). Social science stories are developed according to the level of thinking of elementary school students (Dreher, 2016; Pradhan & Singh, 2016; Ruiz-Gallardo & Reavey, 2018). Elementary school-age children have a developed mind towards concrete and rational thinking (which is reasonable) commonly known as a concrete operating period, the end of imaginary thinking and starting to think concretely related to the real world (Levine, 2018; Rienties et al., 2017; Thadani et al., 2017). The social science storybook developed was also adapted to one of the learning objectives of Natural Sciences. One of the goals of learning Natural Sciences, namely developing curiosity, positive attitudes, and awareness of the existence of mutually influential relationships between Natural Sciences, the environment, technology and society (Winarti et al., 2019). Social values developed in Natural Sciences, namely: (1) religious values, (2) practical values, (3) intellectual values, (4) social politics, and (5) the value of education (Baumfalk et al., 2018; Granger, Bevis, Southerland, Saka, & Ke, 2018; Sanchez-Martin, Cañada-Cañada, & Dávila-Acedo, 2018; Winarti et al., 2019). The value of education in science stories leads to the character developed for elementary school students, namely: religious, honest, tolerance, discipline, hard work, creative, independent, democracy, curiosity, nationalist spirit, love for the country, respect for achievement, friendship / communicative, peace-loving, fond of reading, caring for the environment, caring for the social, and responsibility (Acikalin & Kilic, 2017; Amry, 2018; Bacia & Ittel, 2017; Budde & Weuster, 2017; Gholami & Qurbanzada, 2016; Hemmerechts, Kavadias, & Spruyt, 2017; Kisby, 2017; Kolbe, 2015; Neoh, 2017; Park, 2017; Winarti et al., 2019).

The development of digital books on social science stories for the generation of alpha is considered highly qualified and promises the future and is easily remembered by elementary school students. Presentation of stories with interesting illustrations and appropriate color gradation choices make student learning motivation increase. The social science storybook produced with the Adobe Photoshop CS6 program for the alpha generation 4.0 industrial revolution era is assumed to be able to support the school literacy movement program being implemented in Indonesia.

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