

The Effect of Picture Story Book Based on Scientific Approach with Discovery Method on Collaboration Attitude of Elementary Student

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Abstract— The collaboration attitude is essential to be accustomed to the students so that the student can work well with others in the future. The collaboration attitude is also required to meet the demand of learning and innovation skills in the Industry 4.0, which emphasizes that students should have good collaborative skills. Unfortunately, the empirical foundation states that the collaboration attitude of the elementary school students has not been developed properly. Therefore, the objective of this study was to improve the collaboration school attitude of the elementary school students. This study aimed to investigate the effect of using the picture storybook based on a scientific approach with discovery method on the collaboration attitude in learning and the different influence of the storybook compared with two other scientific books (AAB and 2013 Curriculum book) on the collaboration attitude. The subjects of the study were 81 third-grade elementary school students in Gunung Kidul District, Yogyakarta. Data was collected using observations and questionnaires. Data were analyzed using ANOVA. The results of this study show that the picture storybook based on a scientific approach with discovery method gave a higher positive influence compared to AAB and 2013 Curriculum book. In other words, the use of the picture storybook based on a scientific approach with discovery method is effective as a learning resource book to improve the collaboration attitude of elementary school students.

Keywords— *picture story book, collaboration attitude, elementary students.*

I. INTRODUCTION

The changing transition of industrial development 4.0 influences many aspects of life, including education. The Indonesian Government has established the Law No. 2- of 2003 on National Education System, particularly on Article 3 which discusses the functions and objectives of national education. The core competencies emphasized in the 21st-century are learning and innovation skills, digital literacy, and life and career skills [1]. Learning and innovation skills consist of critical thinking skills,

creativity, communication, and collaboration [2]. Logical consequences that occur when the competence is achieved are the increasing wealth and security of the nation in facing 21st century challenges in various fields and competing with other countries. Therefore, improving the quality of education and teaching in Indonesia, especially in elementary school is essential to produce human resources, who are superior and quality in every era. One of the applications of the scientific approach in 2013 Curriculum is making the student to solve a problem in groups. This can be used as a solution to overcome the low level of collaboration attitude. In fact, although the scientific approach has been implemented by third-grade elementary school teachers in Wonosari, Yogyakarta. This did not bring a positive effect on elementary school students' collaboration attitude. The tendency of students to group with their friends and refusing to group with other students show the student's selfishness and the low level of collaboration attitude. Hence, it is essential to familiarize the collaboration attitude with the students as early as possible. Improving the collaborative skills of students is significantly influenced by the ability to communicate well [3]. By making the elementary students learning groups regularly, they will learn to develop their collaboration attitude and train students to the other group members in completing [4]. Students who have a good collaboration attitude can solve problems in group work easily [5], [6], [7].

In another study, three elements that affect children's attitudes are books, magazines, and learning materials in the family environment [8]. The book serves as a visual aid to illustrate the concepts described in the text that can help students to understand scientific concepts [9]. Books are often used by teachers or parents as a source of knowledge and tools in the learning process of children. In the 2013 Curriculum, the book used during the study is

the thematic book of the 2013 Curriculum in the form of teacher books and student books. In addition to the 2013 thematic curriculum, teachers can also use other supplementary books in the learning process. The supplementary book is a book that contains learning materials that match the learning theme in the 2013 Curriculum. Moreover, the supplementary book also must meet the requirements as stipulated in Ministry of Education and Culture Regulation No. 8 of 2016 on Books Used by Education Units. The regulation explains that the book used by an education unit is composed of textbooks and non-text books that are attractive, easily understood, have a high degree of legibility, and they fulfill the values relevance and prevailing in the community. One of the supplementary books that teachers can use is a science-based illustrated storybook with discovery method written by Anisa Yulistia.

A picture storybook based on a scientific approach with discovery method is a book adjusted to the intelligence level of elementary school children in terms of pictures, stories, and other contents. This book contains stories with lesson materials, which encourages students to perform activities in a scientific approach with discovery methods to improve the collaboration attitude of third-grade elementary school students. The picture storybook is expected to influence the collaboration attitude of third-grade elementary school students. In addition to using the storybook, this study also used the authentic assessment book (AAB) and 2013 Curriculum book to find out which book had the most significant influence on student collaboration attitude. The 2013 Curriculum book and AAB are scientific-based approach books with an authentic and activity-based assessment. The learning theme used was the seventh theme, namely 'Energy and Its Changes'. This theme was selected because many learning activities in this theme are in the form of group experiments. Therefore, it was used to measure the effect of the book on the student collaboration attitude.

The research problems were (1) whether the picture storybook based on a scientific approach with discovery method affects the student collaboration attitude, and (2) how the influence of the storybook differs from the AAB and 2013 Curriculum book. Therefore, through learning through picture book based on a scientific approach with discovery method, students are expected to develop collaboration attitude.

II. LITERATURE REVIEW

A. *Picture Story Book based on Scientific Approach with Discovery Method*

The picture storybook based on a scientific approach with discovery method used in this study is written by [10]. This book has an integrative thematic design on several subjects. This book is adjusted to

the intelligence level of elementary school children in terms of pictures, stories, and other contents. This book contains stories with lesson materials, which encourages students to perform activities in a scientific approach with discovery methods to improve the collaboration attitude of third-grade elementary school students

A picture storybook helps children's learning process and builds their thinking skills, perceptions and interpretations of the environment, and fostering their sensitivity to the environment [11]. A storybook that contains a continuous story about the daily life is very useful in a discussion so that students can comment on their daily life while also preparing students for their future [12], [13]. The choice of the story can be adapted to the material to be discussed in the lesson, for example, electrical or forces in the science subject. The story content should contain questions that can stimulate students to find out the answer [14]. Several benefits that students gain through learning using picture storybooks are: (1) learning using picture storybooks helps low-grade students to understand and implement the learned material [15]; (2) learning using picture storybooks helps students to learn about new vocabularies receptively and expressively [16], [17]; (3) graphic design elements and written text broaden the perspective of students in understanding important texts or instructions [18] and (4) a picture storybook helps students to develop scientific information and present evidence based on scientific information, and it helps teachers to facilitate cognitive and affective involvement of the student with literacy and science [19].

B. *Other Supplementary Books*

Other supplementary books used in this study were the 2013 Curriculum book and the authentic assessment book (AAB). The 2013 Curriculum book is a textbook compiled by the government for elementary school teaching. The 2013 Curriculum book consists of teacher books and student books. It contains a variety of learning materials and practice questions that are packed in integrative thematic from several subjects into one learning theme. One learning theme consists of 3 – 4 subthemes of learning, and each subtheme has six lessons.

The authentic assessment book (AAB) is a book developed to help teachers implement the 2013 Curriculum. The book is presented in accordance with the Government's 2013 thematic textbooks by accommodating concept exploration, activities, practice, and assignment. The main purpose of AAB presentation is to help students to carry out the scientific learning process and help teachers to do an authentic assessment [20]. The AAB is similar to the 2013 Curriculum book that consists of one theme which is then divided into 3 – 4 subthemes with each subtheme has six lessons. Characteristics of the AAB are: based on scientific learning, supplemented with authentic assessment sheets and written test.

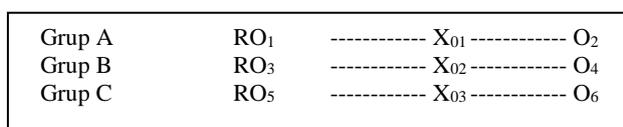
C. Collaborative Attitude

A collaboration attitude is a combination of individual attitudes formed based on a mutual commitment that is manifested in the form of a group attitude and behavior in accordance with procedures to obtain benefits and achieve common goals [21]. Cooperative-oriented learning activities can increase students' understanding of the material, as students have the opportunity to exchange knowledge in the form of opinions, ideas, or thoughts. Engaging with others can open opportunities for evaluating and improving students' understanding [22]–[24]. Some educators have realized that learning that develops students who are smart, critical, and creative and able to work together in solving daily life problems is essential [25]. This is because, during the learning process, the learners put more emphasis on learning about a thing rather than learning how to be. The collaboration attitude based on active, student-centered learning is reflected in new experiences during group work by giving feedback to group members [26]. It provides an understanding that student-centered learning with teachers as the facilitators develops a mental framework built on the basis of prior knowledge, enabling group learning and interaction. Some aspects that reflect the collaboration attitude are (1) group ability; (2) intimacy and sincerity; and (3) the ability to do group work [27], [28]. Teachers can develop student collaboration by encouraging individual independence and accountability, grouping heterogeneously, fostering a sense of shared leadership, asking students to share responsibilities with each other in task work, teaching social skills directly, observing and intervening, and helping the group to process its effectiveness [29]. This study used group activity-based books to analyze their effect on the collaboration attitude.

Hypotheses in this research were: 1) The picture storybook based on a scientific approach with discovery method have a positive and significant effect on the collaboration attitude of third-grade elementary school students, and 2) There is a different effect of the storybook, 2013 Curriculum, and AAB on the collaboration attitude of third-grade elementary school students.

III. METHOD

This was a quantitative study with a quasi-experimental approach. The study used a pre-test-post-test nonequivalent control group design. The study design according to [30] is illustrated in Figure 1.



The study population was all third-grade elementary school students in Wonosari in 2017/2018 academic year. The sampling used the simple random sampling technique, by choosing the required participants to obtain class III A, B, and C of Wonosari I elementary school as the study sample. The respective experiment class 1, 2, and 3 were class III A, B, and C with 27 students in each class. Thus, the total number of students was 81 students. The treatment of study subjects is presented in Table 1.

Table 1. Research Sample

No	Kind of Class	Amount of student	Treatment	
1	A	27	Experiment 1	(with Picture Story Book)
2	B	27	Experiment 2	(with curriculum 2013 book)
3	C	27	Experiment 3	(with AAB book)
Total		81		

The data was collected via questionnaires (non-test). The questionnaires were used to know the respondents' opinion on the collaboration attitude during learning. Questionnaires were given twice, once at the beginning of the study along with the pre-test and the other one at the end of the study along with the post-test. The collaboration attitude was measured using questionnaires given before (pre-test) and after (post-test) treatment. The preparation of the collaboration attitude table was based on the opinions of [29] and [28], which state that the collaboration attitude includes group ability, and intimacy and ability to do group tasks. The collaboration attitude table is presented in Table 2.

Table 2. Collaboration Attitude

No	Aspect	Indicators
1.	Group ability	a. Work effectively
2.	Intimacy	a. Compromised with other in group b. Giving attention to group
3.	The ability to do group work	a. Responsible for all group task b. Respect for opinions from other

The first research problem of whether the picture storybook based on a scientific approach with discovery method affects the student collaboration attitude was answered with the paired-sample t-test. Meanwhile, the second research problem of how the influence of the storybook differs from the AAB and 2013 Curriculum book was answered with ANOVA.

A. Result

The prerequisite assumption test was performed prior to hypothesis testing of collaboration attitude for experimental groups 1, 2, and 3. Assumption test was done through normality test using the Kolmogorov-Smirnov test, and homogeneity test using Lavene test. The result shows that the data was homogenous and distributed normally because both of the significant values were greater than 0.05.

The study used the paired t-test to analyze the mean of collaboration attitude before (pre-test) and after (post-test) treatment. The results of the paired t-test are presented in Table 3.

Table 3. Sample Paired Test

Data	Condition	Mean	Sig.	t	
Class A (Picture story book)	Pretest	-	0,000	7.215	Signifikan (p<0,05)
	Posttest	6.87593			
Class B (K13)	Pretest	-	0,000	6.676	Signifikan (p<0,05)
	Posttest	6.80198			
Class C (AAB)	Pretest	-	0,000	4,166	Signifikan (p<0,05)
	Posttest	6,66617			

The results show that the H_{a1} , H_{a2} and H_{a3} hypotheses were accepted because the significance values 0.000 were smaller than 0.05 ($p = 0.000 < 0.05$). Thus, the storybook, the 2013 Curriculum book, and AAB had a positive and significant effect on collaboration attitude of third-grade elementary school students. It also means that the mean between pre-test and post-test in the three classes had different outcomes in which scientifically based book-based illustrated storybooks using discovery methods show the storybook had a higher mean increase from pre-test to post-test than the 2013 Curriculum book and AAB. The next test was the univariate test or ANOVA to answer how the influence of the picture storybook differs from the AAB and 2013 Curriculum book. The ANOVA test results are displayed in Table 4.

Table 4. ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	583.531	2	291.765	11.405	.000
Within Groups	1995.473	78	25.583		
Total	2579.003	80			

The ANOVA test results show that the significance value (0.000) was smaller than 0.05; thus, the H_0 was rejected. Therefore, there was a meaningful difference effect from the use of the storybook, AAB and 2013 Curriculum book on collaboration attitude of third-grade elementary school students. The next step was the tests of between-subjects effects.

Table 5. Tests of Between-Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Kelas	583.531	2	291.765	11.405	.000	.226
a. R Squared = .226 (Adjusted R Squared = .206)						

Based on the result of the univariate test analysis using tests of between-subjects effects at post-test value, the F_{calc} of collective collaboration attitude variable was 1.313 with the significance of 0.000,

which was smaller than 0.05 ($p < 0.05$). These values indicate that the three books had the same effect on the collaboration attitude of third-grade elementary school students. The effect of all three books together on the student collaboration attitude is shown in the partial eta squared column of 0.226. To analyze the influence of each book on student collaboration attitude, Tukey's test is presented in Table 6.

Table 6. Tukey's test

(I) Collaboration	(J) Collaboration	Mean Difference (I-J)	Std. Error	Sig.
Class A	Class B	6.2098*	1.37660	0.00
	Class C	4.9751*	1.37660	0.02
Class B	Class A	-6.2098*	1.37660	0.00
	Class C	-1.2347	1.37660	0.64
Class C	Class A	-4.9751*	1.37660	0.02
	Class B	1.2347	1.37660	0.64
Based on observed means.				
The error term is Mean Square (Error) = 25.583				
*. The mean difference is significant at the 0.05 level.				

The storybook's significance value of the collaboration attitude variable on class B and C were 0.000 and 0.002, respectively. This means that the storybook had a significant effect on collaboration attitude compared to the 2013 Curriculum book and AAB. The collaboration attitude value of the storybook was 6.2098 times greater than the 2013 curriculum book and 4.9751 times greater than the AAB. As can be seen in the Tukey test results in Table 6, the storybook had the greatest influence on collaboration attitude compared to the 2013 Curriculum book and AAB.

B. Discussion

The paired t-test results show that on the variable of collaboration attitude: H_{a1} , H_{a2} , and H_{a3} were accepted with significance value 0.000 ($sig = < 0.05$). This means that the mean between pre-test and post-test in class A, B, and C was different on the collaboration attitude variable. Based on the ANOVA analysis, the combination of the storybook, the 2013 Curriculum book, and AAB had a positive effect on the collaboration attitude, but with different degree of influence. Based on Tukey's test result, the mean difference of the storybook was 6.2098 times larger than the 2013 Curriculum book and 4.9751 times larger than the AAB.

The collaboration attitude is the cooperation behavior of someone for others to achieve certain goals more quickly. Based on the analysis results, the picture storybook based on a scientific approach with discovery method had a positive and significant effect on the collaboration attitude of third-grade elementary school students. This could be caused by the fact that the storybook presents activity-based learning to help teachers and students to complement and enrich material from various sources and learning activities

The cooperative-oriented learning activities can increase students' understanding of the material, as students have the opportunity to exchange knowledge in the form of opinions, ideas, or thoughts. Engaging with others also can open opportunities for evaluating and improving understanding. This is similar to Lakoy's (2015: 983) view that collaboration with other students can be demonstrated by the ability to work effectively, the inclination of compromise to achieve common goals, creating a shared sense of responsibility for collaborative work, and having respect for the opinions of other group members.

Collaboration can be defined as a skill of team work. Teamwork or collaborative was identified as one of eleven essential learning outcomes in the seminal AACU report *College Learning for the New Global Century* [31]. However, an important aspect of collaborative work is its group formation [32]. Over the years, several methods of collaborative group formation have been proposed by the researchers. These have been implemented from the learner as well as instructor point of view. The simplest way of doing this is to let the learners choose their own groups [33]. It has been found that in this case, learners tend to choose groups based on friendship rather than background learning. These groups generally contain learners with similar collaborative skills and knowledge levels. The learning in this study was designed in groups. Each class was divided into five small groups. Experiments were done to develop student collaboration attitude. The experiments had a positive impact on students' understanding of others. Therefore, the collaboration attitude can be measured through the observation of student interaction. Some other aspects that reflect the collaboration attitude are (1) group ability; (2) intimacy and sincerity; and (3) the ability to do group work [28]. The analysis results show that the mean was increased from pre-test to post-test, with the highest student collaboration attitude was achieved by class A, followed by class B, and lastly, class C. In this study, assessment of the student's collaboration attitude was done by combining the results of self-assessment questionnaire, assessment between friends, and researchers' observations. The results then divided by three to obtain the mean of the collaboration attitude. The overall mean score of each indicator shows the increase from pre-test to post-test.

Learning using scientific approach can create a symmetrical relationship between teachers with students and students with students. The scientific approach encourages students to be more independent but not selfish and can face and think critically when solving problems [3]. Therefore, the scientific approach could help students to develop their collaboration attitude. However, it takes more time and effort from the teacher to condition the students to get the students used to collaboration. The teacher's role in facilitating the student's collaboration attitude is by focusing on the student's practices or

experiments. The practices can be used to measure the number of conscious interactions that teachers made to small groups of students, as well as the interaction between students and groups of students. In conclusion, the book that gives a positive effect on the collaboration attitude is the picture storybook based on a scientific approach with discovery method.

IV. CONCLUSION

- 1 There was a positive and significant influence of the use of the picture storybook based on a scientific approach with discovery method on the collaboration attitude of third-grade elementary school students. This is shown by t_{calc} value of the storybook in Class III A, which reached 7.215 for $df = 26$ at 5% significance level of 6.87593. From the experimental class, the p -value is less than 0.05 ($p = 0.000 < 0.05$).
- 2 The combination use of the storybook, the 2013 Curriculum book, and the authentic assessment book showed the difference effect on collaboration attitude of third-grade elementary school students. This can be seen from ANOVA test results that showed a p -value smaller than 0.05 ($p = 0.000 < 0.05$). In addition, based on the Tests of Between-Subjects Effects on the post-test value, the three books had the same interaction effect on collaboration attitude of third-grade elementary school students. The effect of all three books together was 0.226. However, the picture storybook based on a scientific approach with discovery method had the highest influence compared to the 2013 Curriculum book and the authentic assessment book.

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