



Development of Assessment Instruments in Project-Based Learning to Measure Collaboration Skills and Compassion for Students in Elementary School



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Abstract

This study aims to develop an assessment instrument in project-based learning to measure collaboration skills and compassion for students in elementary school. The type of research and development used refers to the R&D theory of Borg and Gall. The population of this research was three schools in the Apple cluster, Sukarame district. The sample of this research was the fifth-grade students of SD Negeri 1 Way Dadi. Data collection techniques using non-test in the form of observation, questionnaires, and documentation. Data analysis uses validity, reliability, and effectiveness. The results of this study indicate that the assessment instrument in project-based learning. It measures collaboration skills and compassion for students in elementary school, which are adequately developed with theoretical feasibility, practically, and effectively.

1. Introduction

Learning assessment is an essential and inseparable part of the learning system. Review used a tool in the form of an instrument. Assessment instruments are carried out on various learning models recommended in the 21st century, including inquiry, discovery, problem-based learning, and project-based learning. One of them is the project-based learning model, which is usually abbreviated as PjBL. According to Baron (2011: 29, it is a learning process using real projects in life. The assessment instrument in project-based learning is used to assess students according to the stages in project-based learning that challenge and motivate students in education.

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The stages of project-based learning consist of several activities carried out by students in completing project assignments. Aldabbus (2018: 74) explains the phases of project-based learning, including starting with the essential question (determining basic questions), designing a plan for the project (designing project plans), creating a schedule (compiling a program), monitoring the students and the progress of the project (monitoring students and project progress), assessing the outcome (testing the results), and evaluating the experience (estimating experience). Moses' opinion in Xiao et al. (2013: 11) states that the learning process carried out through the project-based learning stage can improve skills in attitudes such as teamwork, collaboration skills, compassion between group members, and achieving high-level abilities needed in the 21st century such as thinking skills critical and creative. It is in line with Pranowo's research (2013: 225, where project-based learning is the main learning that can be used in learning to develop collaboration skills (collaboration) and students' compassion skills using assessment instruments.

Collaboration skills can train students to work together in groups, construct knowledge, participate in making decisions, and find the right conclusions to solve problems in learning (Chang & Lee, 2010). This collaborative process can be mapped into various stages according to Gash in Noviana et al. (2019: 140), namely the existence of face-to-face dialogue, building trust (trust-building), building commitment to the process (commitment to the process), share understanding (shared understanding), and then the formation of an interim outcome (intermediate outcome). Other forms of social attitude interaction skills are compassion skills which are the main character in each student and are the concepts that underlie quality and human relations. Compassion is a matter of how we treat each other by showing a kind attitude, willing to share, help, and give. Compassion skills are essential for effective and meaningful learning in the classroom. This is also expressed by Louis et al. (2016: 312) as follows:

“Compassion skills is a social skill to make students a positive and meaningful classroom in the learning to take place effectively. Compassion skills are social skills to make students positive and meaningful in the classroom so that learning takes place effectively”.

In fact, the collaboration skills and compassion of students are difficult to assess, and the assessment instruments for collaboration skills and compassion are rarely used by educators, where educators in learning, especially the 2013 curriculum, emphasize only cognitive assessment instruments. Sari (2017: 5), Prasanti (2017: 10), and Candra et al., (2018) stated that the learning process is still centred on educators with the lecture method, the development of learning models is still minimal, teaching materials are focused on one teaching material, namely student books or books. In the teacher's book, the assessment process is still oriented towards cognitive assessment, although in reporting, the assessment includes an assessment of attitudes (affective) or KI-2, knowledge (cognitive) KI-3, and skills (psychomotor) KI-4.

This happens because there are several factors that affect the difficulty of assessing collaboration skills and compassion, explained in the Regulation of the Minister of Education and Culture Number 57 of 2014. Some of these factors include low commitment, inadequate ability and knowledge, limited supporting facilities, willingness politics, both the central, regional, and school governments, and the ineffective dissemination of information. Changes in assessment policies generally have an impact on the development of educators both physically and mentally. The 2013 curriculum, which requires educators to assess social attitudes, has many problems. This burden on the minds of

educators makes them reluctant to assess social attitudes, especially collaboration and compassion for students. Similar problems are also contained in Cimermanova's research (2015) says:

"Many educators complain about the assessment and the factors that hinder its implementation. Some of these factors are related to the attitude of educators towards assessment, where some think the subjective assessment is difficult, some other educators think it takes time, especially in large classes, and there are educators who do not have knowledge about how to assess collaboration and compassion".

Based on the results of preliminary research needs analysis through a questionnaire regarding assessment instruments in project-based learning to measure student collaboration and compassion with a target of 15 fifth grade educators, it was found that educators need an assessment instrument in project-based learning to measure student collaboration and compassion that is easy, clear, practical, and according to the conditions of learning in schools. Where 13.3% of educators do not know how and have not implemented effective assessment in their classrooms. In addition, 80% of the effective assessment instruments used in classroom learning are products from the government, and only 13.3% of educators develop their own effective assessment instruments. The application of effective assessment, especially in measuring collaboration and compassion for students, has 80% of educators having difficulties. Regarding the learning process using the project-based learning model, 93.3% of educators already know and do it, but 73.3% of educators have difficulty in learning using this project-based learning model. Educators also need to make effective assessment instruments that are in accordance with school conditions and need feedback for educators to improve teaching. The principal supports educators to innovate or update the assessment instrument. However, until now, educators still find it difficult to develop assessment instruments, especially effective assessments, so that affective assessments cannot be carried out optimally.

Further preliminary research was conducted through a questionnaire to determine the response of students regarding the implementation of the project-based learning model. Questionnaires were given to 20 students in class V, and the results showed that students in class V had done tasks in the form of projects such as making designs, writings, works of art, technological works or crafts, but 40% of students still did not understand how to make assignments in the form of projects. Students do not understand how to make assignments in the form of this project, starting from planning, implementing to reporting results according to the stages of the project-based learning model.

Based on the needs analysis above, it can be concluded that the assessment applied is less than optimal, especially for effective assessment instruments. Educators have difficulty understanding the attitude assessment criteria from the existing guidelines in the teacher's book and have not developed their own effective assessment instruments. So, the researcher will conduct a development entitled "Development of Assessment Instruments in Project-Based Learning to Measure Collaboration Skills and Compassion for Class V Elementary School Students".

2. Materials and Methods

Assessment Instrument

It is important in the assessment to make an assessment tool or instrument. Generally, the assessment instrument is a tool to collect data on the results of the learning process. Daryanto in Wardah (2018: 34) explains that assessment instruments are factors that have a relationship or influence on student learning outcomes and the success of achieving a particular program. Furthermore, Tan (2006: 35) explains that an assessment instrument is a tool that meets academic requirements, so it can be used as a tool to measure a measuring object or collect data about students. An assessment instrument is a tool used to collect data in a study or assessment. Collecting research or assessment data, one can use instruments that are already available or standard instruments and can also be made with instruments that are made themselves (Rosidin, 2017: 40).

Compassion

Humans living in this world definitely need other humans to carry on their lives because, basically, humans are social creatures. Alder (2002: 250) explains compassion is a matter of how we treat each other, be kind, willing to share, help, and give. Meanwhile, Louis et al. (2016: 312) explains, "Compassion skills is a social skill to make students a positive and meaningful classroom in the learning to take place effectively". Chandrakumara (2015: 329) explains that there are five indicators of compassion skills, namely compassion for others, empathy, and sharing.

Collaboration

As explained by Xiao et al (2013: 12) regarding the key to collaboration skills which says that "keywords of collaboration skills are team membership, meets obligations, and group participation". Abdulsyani in Hinyard et al. (2019:15) says that collaboration means working together to achieve goals and is the most basic social attitude process. Usually, collaboration involves students in the division of tasks, where everyone works in the learning process and combines thoughts until they find a solution. Indicators of collaboration skills, according to Chang & Lee (2010), include love performing tasks in collaboration with accountability and responsibility, effort in work, time management in work, and interaction skills during work.

Project-Based Learning

Project-based learning or project-based learning is learning that is prioritized in the 2013 curriculum and 21st-century learning. The same opinion Bern and Erickson in Wardah (2018: 49) assert that project-based learning is an approach that focuses on the main principles and concepts of a discipline, involving participants students solve meaningful problems and tasks, thus building learning and ultimately producing real work. The stages of project-based learning, according to Chiang & Lee (2016: 710), Tan (2006: 36), and Aldabbus (2018: 74), include start with the essential question, design a plan for the project, create a schedule, monitor the students and the progress of the project, assess the outcome, and evaluate the experience.

Time and type research

This research began in August 2020. The type of research used in this study is Research and Development (R&D) methods. According to Borg and Gall (1983: 775), the R&D research method is a development research method used in producing a product. This research only carries out seven steps, namely research and information collecting, planning, developing the preliminary form of product, preliminary field testing, main product revision, main field testing, and operational product revision.

Research Subjects

We are determining the subject or sample in this study using non-probability sampling with a purposive sampling technique, namely a sampling technique with certain considerations. This study considers the determination of the sample based on the results of the questionnaire in the preliminary study, namely SD Negeri 2 Way Dadi as a small group trial sample consisting of 10 students and three educators for class V, and SD Negeri 1 Way Dadi as a large group trial sample consisting of 30 participants students in class V.

Procedure

The non-test technique is used to obtain qualitative data by reviewing the assessment instrument in the form of a questionnaire. The questionnaire in this study consisted of three, namely: a needs analysis questionnaire during field observations, an expert validation questionnaire, a practitioner/educator response questionnaire. The data that will be processed is data in the form of comments, suggestions, and product improvements from expert validation. The questionnaire for the assessment instrument sheet is assessed by giving a checkmark (√) according to the indicators in the item questions. The research data collection was carried out through several stages. There are; (1) students learn according to project-based learning steps (2) as long as participants do project assignments, educators observe students' collaboration skills and compassion using observation sheets (3) after getting scores from observations of collaboration skills and compassion, educators process values according to criteria (4) the same thing is done for six lessons.

Instrument

This research instrument is an instrument to assess collaboration skills and compassion used when students work on project assignments. The instrument is an observation sheet consisting of several indicators. Before the instrument was applied to students, the product was evaluated by experts to see the theoretical feasibility and evaluated by educators and students to see its practicality by using a questionnaire. Validators consist of evaluation experts, material development experts, and language experts. Expert and practitioner advice is used to revise the product. Feasibility analysis is obtained by using the following formula. Final scores were converted into the following categories, as shown in Table 1 below.

Table 1
Criteria for evaluation of items by Experts and Practitioners

Interval	Score Description
82 – 100	Very Good
63 – 81	Good
44 – 62	Good Enough
25 – 43	Not Good

Sudijono in Noviana et al. (2019: 144)

Then the instrument was tested on students and assessed for validity, reliability, and effectiveness using the one-sample t-test. The results of the one-sample t-test effectiveness test if it shows a significant value above 0.05, thus the hypothesis is accepted, or it is said that the instrument is effective in measuring the collaboration skills and compassion of students.

3. Results and Discussions

Based on the research results, it was found that educators put more emphasis on cognitive assessment compared to affective and psychomotor assessments of students, affective assessment instruments have not been developed by educators and only use affective assessment instrument products from the government, namely teacher books, educators have difficulty understanding the assessment criteria effective, especially in measuring the collaboration and compassion of students, then the project-based learning model has been used but educators have difficulty in implementing it. Therefore, an assessment instrument for project-based learning was developed to measure these collaboration skills and compassion, which are feasible theoretically, practically, and effectively.

3.1. Theoretically Feasible

The feasibility of the assessment instrument theory in project-based learning to measure collaboration skills and compassion is seen from the results of the assessment of three experts, namely evaluation experts, material experts, and language experts. Based on the results of the assessments of three experts, this assessment instrument is theoretically feasible because it obtains an expert evaluation score of 80, material expert 92.5, and linguist 93.75. The average expert score as a whole is 88.75 in very good criteria. The research above is in accordance with the theory of Sunarti and Rahmawati (2014: 135); Wahyuni and Ibrahim (2012: 56); Permendikbud Number 104 of 2014, which states that when compiling instruments, it is necessary to pay attention to construction/evaluation aspects, material aspects, and language aspects.

The construction of the instrument in this research and development was assessed by an evaluation expert. In addition, the analysis of substance or material is assessed by material experts in the form of studies related to scientific substance, especially project material, while language analysis is assessed by linguists in the form of studies relating to the use of good and correct Indonesian. Validation of assessment instruments carried out by experts based on validation questionnaires is to provide assessments, suggestions.

This study has similarities with the results of Noviana's research (2019: 143), which states that the validation of the project-based learning-based collaboration skills instrument is very good and feasible in construction, substance, and language with a very good level of validity so that it can be used. In addition, according to the advice of the evaluation expert, Dr Lilik Sabdaningtyas, M.Pd. and Noviana et al. (2019: 143):

“A good assessment instrument must consist of a grid of instruments, assessment sheets, rubrics, and scoring guidelines. A good assessment instrument must consist of a grid of instruments, scoring sheets, rubrics, and scoring guidelines.

The indicators of collaboration skills in this research refer to Greenstein's theory in Chang & Lee (2010), namely love performing tasks (love of carrying out tasks), effort in work (work effort), interaction skills during work (interaction during work), and time management (time management). The explanation of the collaboration indicators is very appropriate or appropriate to use to work on project tasks through the project-based learning step where students are responsible for their roles. Then good interaction occurs when working on project assignments between students starting from the preparation of tools and materials to a successful job in making students with good time management.

3.2 Practicality

The practicality of the assessment instrument in project-based learning to measure collaboration skills and compassion is seen from the results of small group trials and large group trials. This practicality assessment uses a practicality response questionnaire by educators and students consisting of aspects of attractiveness, convenience, and usefulness. The results of the practicality response of educators by five small and large group educators with an average percentage of 85.63% are very practical. At the same time, the results of the practical response of students by 44 small and large group students with an average percentage of 87.54% are very practical.

The responses of educators and students to the questionnaire stated that the assessment instrument developed has benefits, especially with project-based learning; students can measure and develop the skills possessed by students, especially collaboration skills and compassion. These results are in accordance with the results of research by Noviana et al. (2019: 143), Aldabbus (2018: 77), and Johnson (2002: 158) that the assessment instrument in project-based learning is very appropriate to use observation sheets or observations during the process of working on project assignments. In addition, the assessment of project-based learning has a significant influence on the development of skills possessed by students, such as collaboration and compassion.

Based on the results of the study, the assessment of project-based learning to measure collaboration skills and compassion developed has advantages when compared to the skills assessment instrument contained in the teacher's book. The following Table 18 shows the difference between the assessment instruments resulting from the development and the existing assessment instruments.

Table 2
Differences in the Assessment Instruments developed with those already

No	Assessment Instruments	
	Yang sudah ada	Yang dikembangkan
1	The instrument is presented globally/generally not detailed skills that are assessed both process and product	The instrument is presented in detail the skills in the assessed aspects of both process and product
2	It has not included instructions for use so that educators have difficulty using it	Instructions for the use of assessment are clear
3	The criteria in the aspects assessed aren't clear	The criteria used are clear to assess the skills of students, so they are easy to use

3.3 Effectiveness

The effectiveness of the assessment instruments in project-based learning to measure collaboration skills and compassion is seen from the results effectiveness test in large group trials. This effectiveness assessment uses a one-sample t-test, which is an analytical technique to compare one class of data or variables. This technique is used to test whether the value of collaboration skills and compassion from the results of this study differs significantly or not from the average of a sample. The results of the test of the effectiveness of the assessment instrument product on project-based learning to measure collaboration skills and compassion based on the value for collaboration skills and compassion is $0.00 < 0.05$, it is concluded that it is effective. Measuring collaboration skills and compassion can be seen with observation sheets in lesson 1 to lesson 6 in each indicator. The results of achieving collaboration skills obtained an average percentage of 80.4% with high criteria. At the same time, the results of the achievement of compassion skills obtained an average percentage of 80.95% with high criteria. The instrument is said to be effective because it is detailed and clear about project assignments, and a learning assessment sheet is provided. In line with Noviana et al. (2019: 143) shows the results of his research that students are more enthusiastic in doing project assignments with a variety of detailed and clear activities so that monitoring the learning process and assessing student skills is easier.

4. Conclusion

Based on the results of research and discussion, it can be concluded that the assessment instrument in project-based learning to measure collaboration skills and compassion developed is theoretically feasible. This is evidenced by the assessment of 3 experts, namely evaluation expert, material expert, and linguist, who stated that the assessment on project-based learning to measure collaboration skills and compassion developed in the criteria was very good. In addition, the assessment instrument developed was valid and reliable. Then, an assessment instrument on project-based learning to measure collaboration skills and compassion was developed practically. This is evidenced in small group and large group trials through practical responses to aspects of convenience, attractiveness, and usefulness to educators and students in very practical criteria. And an assessment instrument in project-based learning to measure collaboration skills and compassion that are developed effectively. This is evidenced by the results of the effectiveness test with a significance level value of less than 0.005, then H_a is accepted. Then this is proven again by the

results of observations using the observation sheet for collaboration skills and compassion for students in very good criteria.

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