

# Development of Collaboration and Communication Skills Assessment Tools Based on Project Based Learning in Improving High School Students the Soft Skills

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**Abstract**—This research aims to create collaboration and communication skills assessment tools based on project based learning in improving students' soft skills that are valid, practical and effective. This research design uses research and development method with Borg & Gall development model adapted into 7 development steps, namely: (1) Research and information collection; (2) Planning; (3) Product develop Preliminary; (4) Preliminary Field Testing; (5) Main Product Revision; (6) Main Field Testing; (7) Operational Product Revision. This article is only reported until the Product develop Preliminary stage of developing the initial form of the product to be produced. Included in this step are the preparation of supporting components, preparing guidelines and manuals, and evaluating the feasibility of supporting tools. The data collection used is a questionnaire with google form collected from high school physics teachers in Lampung. The data analysis used is qualitative descriptive analysis. The results of this study are teachers in high school in Lampung province 75% have not used collaboration assessment instruments or communication. 15% teachers already know the form of collaboration and communication assessment instruments but have not implemented them. Students have different learning abilities. Students who get low cognitive grades tend to be students who have good communication skills. 90% of students tend to choose learning in practice rather than simply taking notes in class. Learning models suitable for the process of learning physics in order to improve collaboration (cooperation) and communication that is a project based learning model where this PJBL learning model students are required to create a project with a teamwork system in addition to improving collaboration and communication students this learning model can see soft skills possessed by students and can be developed. In this preliminary study 100% of teachers in Lampung agreed if created and developed collaboration and communication learning assessment instruments in order to multiply or form soft skills of students

**Keywords**—*collaboration and communication, project based, soft skills*

## I. INTRODUCTION

Education in the 21st century aims to build students' intelligence skills in learning in order to solve the problems that exist in the vicinity. Education has a strategic role to play in preparing qualified young people in accordance with 21st century challenges including skills focused on innovation learning skills. This demonstrates the importance of 21st century skills for high school graduates to possess. There are four skills that students must have in the 21st century: *critical thinking and problem solving skills, communication skills, creativity and innovation, and collaboration*. Regulation of the Minister of National Education of the Republic of Indonesia no. 20 of 2016, on the competency standards of graduates for each graduate of the primary and secondary education units which stipulates that students must have competencies on three dimensions namely attitude, knowledge, and skills. Learning by conveying the subject matter will float hard skills but not grow soft skills. The existence of soft skills supports students to be able to keep up with their development and socioeconomic needs.

The development of soft skills is now a reference that the government is considering in the development of graduate careers in the future. In accordance with Permendikbud number 65 of 2013 about the standard of process that wants improvement and balance between physical skills (hard skills) and mental skills (soft skills). Soft skills are very important to develop so that students are ready to continue to a higher level of education or start working in a company or independent [1] also suggesting that hard skills only have a contribution of 15% to one's success, and 85% success is obtained from soft skills. In addition to soft skills collaboration skills are very important to develop so that students can cooperate in different groups as a provision to deal with the era of globalization of the 21st century.

Communication skills and collaboration skills according to Bell [2] are considered to be the most needed skills in the world of work. *Way of working* which is part of the *skills category* of

*assessment and teaching of 21st Century Skills (ATC21S)* includes communication skills, collaborating [3]. Good communication skills are also very valuable skills in the world of work and daily life. Communication skills include the skill of conveying clear and persuasive thoughts orally or in writing, the ability to express opinions with clear sentences, convey commands clearly, and can motivate others through speech skills. The skills of collaborating and communicating must be identified using clear and real precise assessment instruments. Therefore, the important thing for teachers to do is to develop and implement appropriate assessment tools during physics learning. Assessment tool that can measure students' skills in collaborating and communicating one of the learning models that is seen as facilitating the development of soft skills of students both face-to-face and conducted online because of the less effective situation of face-to-face learning, namely project-based learning models. The *project based learning (PjBL)* model is the right learning model to train students' collaboration and communication skills. Project Based Learning (PjBL) is a learning model based on constructivism that supports student involvement in problem-solving situations by completing projects.

The *Project Based Learning* learning model is one of the relevant learning models for implementing the 2013 curriculum and can effectively address problems in the classroom. The Project Based Learning (PjBL) Learning Model consists of several stages where each phase must be completed according to the specified time. The stages are Introduction, Essential Question, Research and Write, Product Creation, Presentation, Evaluation and Reflection. Learning using this model makes students accustomed to discovering the concept of physics through projects given by constructing knowledge within students. The results showed that 90% of students who participated in the learning process with project-based learning implementation were confident and optimistic to implement project-based learning in the world of work and could improve their academic. The *project based learning (PjBL)* model is the right learning model to improve students' collaboration and communication skills.

In addition, the survey results from Lasonen et al. [4] show that 78% of students say that a project-based learning curriculum can help equip students for the preparation of entering the world of work, because students learn not only in theory but practice in the field. This innovative learning model is suggested in the 2013 curriculum in carrying out this learning, in addition to the learning model students also need soft skills that they have so that the stages of learning activities in the classroom can be fulfilled and implemented to the maximum. With the problems in the field, it is necessary to develop the assessment of collaboration and communication skills in project based learning in improving the soft skills of high school students. In accordance with the above exposure that soft skills are needed for students to continue their lives, both to study and to work. The availability of collaboration and communication skills assessment instruments needs to be known in the application of project-based learning to improve students' soft skills. Project-based learning strongly supports the development of soft skills

of students, but it is necessary to use the right assessment to measure them.

## II. BODY OF PAPER

The subjects in the study consisted of four groups. The first group is the subject to conduct a needs analysis consisting of students and teachers. The second group is the subject to conduct validity tests on products that have been developed that are expert practitioners. The third group was the subject of a trial to find out the practicality of the product, namely Teachers and Students. The fourth group was the subject of product effectiveness trials, namely students of Xi Sma Muhammadiyah 2 Bandar Lampung class. This research was conducted to develop collaborative and communicative skill assessment instruments *based on project based learning to improve Soft Skill* using research and development methods. Research and development methods are used to produce a product and test the effectiveness of the product. In research and development methods there are several types of models, one of which is Borg and Gall development model with steps, namely [5]: (1) research analysis, needs analysis and proof of concept; (2) product planning and design; (3) early product development; (4) early field tests; (5) product revision; (6) big field test. In this article, researchers report only the first two stages, namely research analysis, and product planning design. The analysis stage is conducted with the aim of analyzing the needs of educators and students such as analysis of the needs of assessment instruments. At this stage of research analysis and needs analysis is intended to know everything that can be used to support the development of skill assessment tools to be. In addition to knowing how the skill assessment instruments form in the school is in accordance with the provisions of the 2013 curriculum so that it is obtained necessary or not the development of skill assessment instruments on learning. The potential and problems raised in the study should be demonstrated by empirical data. In this case, the potential and problems are demonstrated through the results of the needs questionnaire analysis. This data is collected from 20 educators using google form. The data obtained is analyzed quantitatively descriptively using percentage techniques. The second phase after conducting the analysis stage is the design of the product to find out how the design of collaborative and communicative skill assessment devices will be developed in accordance with *the project based learning* model to improve *Soft Skill*. The results of the analysis are used as a reference in the manufacture of assessment instruments that aim to accommodate the opinions of teachers in Lampung province. Instruments used in the form of Likert scale questionnaires with five options namely (1) strongly disagree, (2) disagree, (3) quite agree, (4) agree, (5) strongly agree. The assessment results of respondents are analyzed by calculating the average score obtained for each question

Preliminary research results based on the analysis of *needs obtained from google form* filled by educators and students in Lampung province. Table 1 below are some of the results of needs analysis Here is a sample table of preliminary research results based on *the analysis of needs obtained from google form* filled by educators contained in Table 1.

TABLE I. RESULTS OF EDUCATOR NEEDS ANALYSIS

No	Statement for educators	%
1	Educators use communication and collaboration instrument sheets to assess students' affectiveness	30%
2	Have educators done learning with pjbl learning models	45%
3	Educators assess all students' abilities using the instruments they create.	25%
4	Educators conduct collaboration and communication assessments to improve students' soft skills	20%

Based on preliminary research results found in table 1 educators used communication and collaboration instrument sheets to assess the affective students 30% of teachers answered using but 70% of teachers did not use for the second question 45% of educators did learning with pjbl learning model. 65% of other teachers used other learning models. 25% of teachers rate all students' abilities but 75% of teachers do not use instruments can only be assessed directly. for collaboration and communication assessment 20% believe in improving students' soft skills but 75% of teachers do not trust to improve students' soft skills. In addition to the form of a table of research results also presented in the form of diagram can see how important the ability of collaboration and communication to form soft skills students assisted by using PBL learning tools are as follows in figure 1:

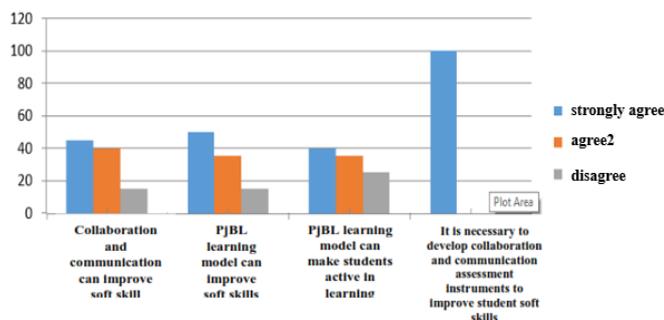


Fig. 1. Preliminary study results graph.

Based on the preliminary research results educators agree when the assessment of collaboration and communication can improve the soft skills of students. PjBL model can improve students' soft skills. The PBL learning model can make students active in learning. And 100% of educators strongly agree on developing collaboration and communication assessment instruments to improve students' soft skills. In preliminary research 75% of the instruments used by teachers in schools have not been oriented towards improving students' soft skills. Soft skills students are very important developed this in line with Kartika [6] suggesting that hard skills only have a contribution of 15% to one's success, and 85% success is derived from soft skills. Based on preliminary research analysis of the needs of students can be seen below found in Table 2.

TABLE II. RESULTS OF ANALYSIS OF STUDENTS' NEEDS

No	Statement for learners	%
1	After the learning process have you ever assessed a friend	80
2	Physics lessons are always done in practice and theory	70
3	Do you like learning physics done in practice	90
4	Have you ever been asked by a teacher to create a product of a physics study?	35
5	Is it by learning directly and making products make into understanding the science of physics	100

From the analysis submitted, 20% of students had done peer assessments and 80% had never done peer assessments. 70% said physics learning at school was only done with theory and 30% of other students said they had studied physics experimentally and did it directly. 90% of students stated that they prefer to learn physics in practice rather than just understanding theory. 35% of students said they had been given a teacher's assignment to make a work with the material being taught. 100% of students stated that learning directly and applied in life would understand the material and get many benefits. Collaboration skills are very important to be developed so that students can work together in different groups as a provision to face the globalization era of the 21st century. Therefore, it is necessary to develop collaboration and communication assessment instruments with the PjBL learning model to improve student soft skills. Good communication skills are also invaluable skills in the world of work and everyday life. Communication skills include skills in conveying thoughts clearly and persuasively orally and in writing, the ability to convey opinions in clear sentences, convey clear commands, and be able to motivate others through speaking skills [1]. Collaboration and communication skills should be identified using appropriate assessment instruments. Through collaboration, students are trained to work together in groups, construct knowledge, participate in making decisions, find the right conclusions to solve problems, and increase control in the learning process [7]. Therefore, it is important that the teacher be compiled and apply appropriate assessment tools during physics learning. An assessment tool that can measure students' skills in collaborating and communicating. One learning model that is considered capable of facilitating the development of student soft skills is the project-based learning model.

Project Based Learning (PjBL) is one of the learning models based on constructivism that supports student involvement in problem-solving situations by completing projects. The innovative learning model suggested in the 2013 curriculum of the average school in Lampung Province uses three assessments in the learning process in the classroom namely affective, cognitive, and psychomotor assessments, based on the distribution of questionnaires through google form in Lampung provincial high school that psychomotor and cognitive abilities are higher than the results of affective assessments, based on this development research students are required to have collaboration and communication skills oriented towards 21st century learning, in addition, high school physics teachers in Lampung Province are still very minimal using the assessment of collaboration and communication skills, 30% of teachers have

never been and 75% have never even seen or used such assessment instruments.

Based on preliminary research results educators agree when the assessment of collaboration and communication can improve students' soft skills. PjBL model can improve students' soft skills. The PBL learning model can make students active in learning. And 100% of educators strongly agree on developing collaboration and communication assessment instruments to improve students' soft skills. Teachers strongly agree to improve collaboration and communication skills can also improve soft skills and teachers strongly agree if the PBL learning model is used. Based on the preliminary research obtained, the design of the assessment instrument is made as follows in figure 2:

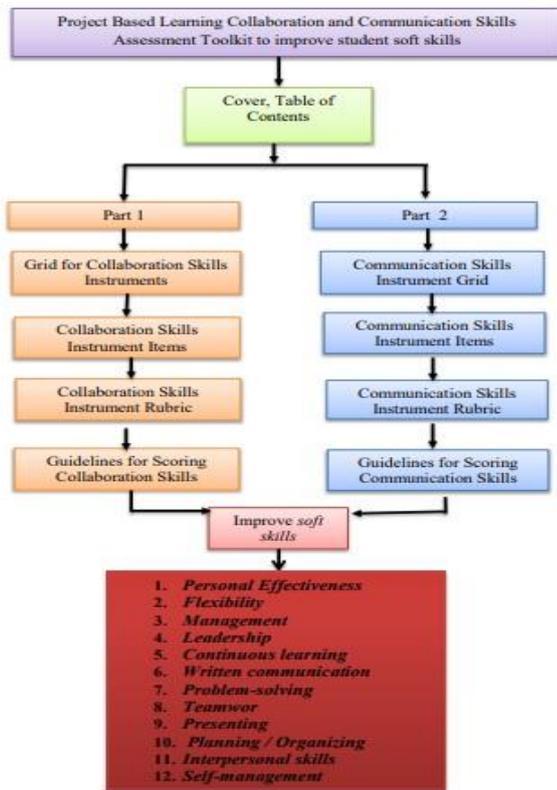


Fig. 2. Collaboration and communication skills device design to improve soft skills.

### III. CONCLUSION

The conclusion of this preliminary study is that there are still many teachers who do not understand how to assess the affective

abilities of students. Teachers assess abilities only by verbally and do not use instruments and questionnaires. Many of the skills students develop will form a soft skill not just hard skill. This article is only reported until the Product develop Preliminary stage of developing the initial form of the product to be produced. Included in this step are the preparation of supporting components, preparing guidelines and manuals, and evaluating the feasibility of supporting tools. The data collection used is a questionnaire with google form collected from high school physics teachers in Lampung.

The data analysis used is qualitative descriptive analysis. The result of this study is that teachers need assessment instruments that will be used to assess students' collaboration and communication skills. 75% of teachers are not yet aware and have not used assessment instruments aimed at seeing the ability of student collaboration and communication to recognize and shape soft skills that students have. In accordance with the above exposure that soft skills are needed for students to continue their lives, both to study and to work. The availability of collaboration and communication skills assessment instruments needs to be known in the application of project-based learning to improve students' soft skills. Project-based learning strongly supports the development of soft skills of students, but it is necessary to use the right assessment to measure them. Design the creation of collaboration and communication assessment instruments using PBL learning models to improve students' soft skills designed effectively and efficiently.

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