Development of Scientific-Based Indonesian Teaching Materials to Train Communication Skills of Physics Education Students FKIP Pattimura University Ambon

Viona Sapulette[1], Heppy Sapulette[2]

[1]Department of Indonesian Language and Literature Education, FKIP Pattimura University, Ambon, Indonesia
[2]Department of Physics Education, FKIP Pattimura University, Ambon, Indonesia

ABSTRACT: This study aims to produce teaching materials based on a scientific approach to train student communication skills. The research design used the Kemp model which was tested on first semester students of 2020 with a total of 26 students in the 2020/2021 school year. The data collected in the form of teaching material validation data, communication skills data, and student response data. The data analysis techniques used include: qualitative descriptive analysis including: the results of the validation of teaching materials, the results of communication skills, and responses. The results showed that: 1) the validity of the student teaching materials developed was categorized as very valid; 2) the achievement of the communication skills studied by the researcher was categorized as very good; (b) Student responses to teaching materials and the implementation of learning were very positive and the lowest percentage was obtained, namely the teaching materials provided were very helpful and interesting to read, namely 81.69% with very good ratings. Based on the research results, it can be concluded that the development of student teaching materials using the scientific approach can train communication skills of students in the Departement of Physics Education.

KEYWORDS: Development; Communication Skills; Scientific Approach; Teaching Materials

INTRODUCTION

The partnership for 21st century skills (P21) (Trilling & Fadel, 2009) first defined 21st century skills including: (a) learning and innovation skills including creativity and innovation (creative and innovative, working innovatively and implementing innovation skills), critical thinking and problem solving (thinking effectively and systematically, making decisions and solving problems) and communication and collaboration (communicating clearly and collaborating with others), (b) information, media and technology skills (information literacy, media and ICT), (c) life and carrier skills (flexible and adaptable, initiative and independent, able to socialize and interact between ethnic groups and nations, productivity and accountability, leadership and responsibility).

To fulfill the partnership for 21st century skills, educators must make meaningful learning that will lead students to memorable learning experiences. Learning means the need for two-way communication between educators and students. In two-way communication, communication skills are needed. Communication skills are the ability to establish relationships through human communication channels or media, so that messages or information can be understood properly. Communication skills are not abilities that are innate and do not appear suddenly, skills need to be learned and trained (Supratikna, 1995). There are also those who argue that communication skills are one of the social skills that must be mastered in the Indonesian language dimension in addition to knowledge, attitude, and skill competencies (Haryanti & Suwarma, 2018; Oviyanti, 2017; Urwani et al., 2018). Therefore, the communication that takes place in learning is not just how an educator conveys teaching materials, but is carried out to develop students into whole individuals, such as solving problems together in groups and fostering a spirit of mutual learning among fellow students. In order to activate students in solving problems together and foster a spirit of mutual learning, an approach that can activate students is needed. The approach that is emphasized in the latest revised 2013 curriculum is a scientific-based approach.

The scientific approach is a learning approach that provides broad opportunities for students to explore and elaborate on the material being studied, in addition to providing opportunities for students to actualize their abilities through learning activities designed by educators (Rusman, 2015). The application of a scientific approach in learning involves communication skills, one of which is communicating. In doing this, the help of educators is needed. However, the teacher's assistance is only to direct and motivate and facilitate students. With scientific-based learning, it will be felt more effective in learning. This is supported by the results of research from Muhammad & Nurdyansyah (2015) saying that in scientific approach-based learning, information retention from educators is more than 90 percent after two days and the acquisition of contextual understanding is 50-70 percent.

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Many researches on Indonesian language teaching materials have been carried out, including Arumdyahsari et al (2016), Nashoih & Darmawan (2019), Saleh & Sultan (2015), and Suyitno (2014). While research on communication skills has also been carried out by Hariko (2017), Kamaruzzaman (2016), Utomo & Harmiyanto (2016), and Wahyuni (2015). All the results of these studies enrich the theoretical study and serve as a reference for this research.

Based on observations at Pattimura University, FKIP in the Physics Education Study Program, there is no Indonesian language teaching material that can train students' communication skills properly and correctly. Whereas communication skills are very important in learning as well as social interaction with the community. For this reason, teaching materials are needed that can train students' communication skills.

Good teaching materials are teaching materials that can activate students in the learning process. With the existence of teaching materials, educators are no longer the only source of learning in the classroom. In this case, educators are more directed to act as facilitators who facilitate and assist and direct students in learning. Meanwhile, by utilizing teaching materials that have been designed according to learning needs, students are directed to become active learners because they can read or study the material contained in the teaching materials before participating in classroom learning. Thus, when discussing material in class, students are ready with sufficient information and knowledge so that the available learning time is no longer used by the teacher to explain the material at length, but is used more for discussion and discussing certain materials not understood by students.

Based on the description above, the researchers want to research about "Development of Scientific-Based Indonesian Teaching Materials to Train Communication Skills of FKIP Physics Students, Pattimura University, Ambon".

METHOD

The development of inquiry-based teaching materials in this study adapts Kemp's (1994) model. According to Kemp (1994) the development of teaching materials is a continuous circle. Each development step is directly related to the revision activity. The development of teaching materials can be started from any point in the cycle. The development of the Kemp model of teaching materials provides the opportunity for developers to be able to start from any component. In general, Kemp's teaching materials development model is shown in Figure 2.1.
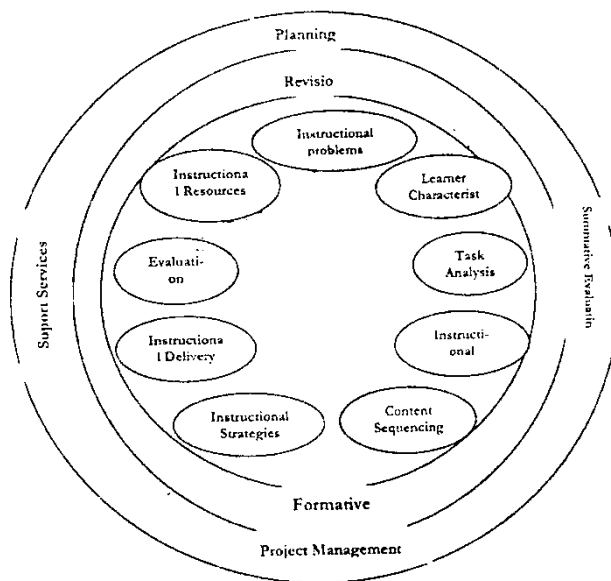

Figure 2.1 The Kemp Model Toolkit Development Cycle

Data analysis in this study was carried out using quantitative descriptive analysis to describe the data as they are in the form of percentages and explain the data or events with qualitative explanatory sentences.

1. Analysis of Learning Device Validity. Data analysis of the validity of the learning device components was carried out by averaging the scores of each component using the following formula:

$$ercentage\ of\ agreement = 1 - \frac{A - B}{A + B} \times 100\%$$

A: The validation frequency that is observed with a high frequency
B: The validation frequency that is observed with a low frequency.

The developed instrument is said to be reliable if the Percentage of agreement value is 75% (Borich, 2015).

2. Skills Analysis . The skill aspect observed in this study is the ability of students to communicate properly and correctly. Data from observations made by researchers are calculated using the formula:

$$Student\ scores = \frac{\sum score\ earned}{\sum total\ scores} x\ 100$$

Table 2.1 Skills Interpretation

Score Percentage	Ability Criteria
81 - 100	Excellent
61 - 80	Very Good
41 -60	Good
21 - 40	Fair
0 - 20	Poor

3. Response Analysis. Student response questionnaires were used to find out students' opinions on the application of the scientific approach. Student responses were analyzed descriptively with percentages using the following formula:

$$P = \frac{\sum K}{\sum N} \times 100$$

FINDINGS AND DISCUSSION

1. Validity of Student Textbooks

The results of the student textbooks validation assessment can be seen in table 3.1.

Table 3.1. Students Teaching Material Validation

No	Rated aspect	validator assessment score		average	reliability	category
		V1	V2			
1	Introduction	4	3,7	**3,85**	96%	SV
2	contents	3,54	3,7	**3,62**	98%	SV
3	characteristics	4	3,5	**3,75**	93%	SV
4	Closing	4	3,7	**3,85**	96%	SV
5	Concept Description	3,7	3,7	**3,7**	90%	SV
	average	**3,85**	**3,66**	**3,75**	**94,60%**	**SV**

Conclusion: The Scientific-Based Indonesian Student Textbooks which was developed is very valid to be used by lecturers in the learning process.

V1	=	Validator	1

V2 = Validator 2

Teaching materials are a set of materials or learning substances that are arranged systematically, and fully display the competencies that will be mastered by students in learning activities (Nasution, 2000). There are also those who argue that teaching materials are all forms of materials used to assist teachers or instructors in carrying out teaching and learning activities(Mudlofar, 2012). The teaching materials used are Indonesian language learning handouts. Handout development was carried out based on the results of the researcher's study of: (1) characteristic analysis, (2) task analysis, (3) concept analysis, (4) problems in learning and analysis of objectives.

The handout that was developed was then validated by two validators based on five aspects, namely the preliminary aspect with a score of 3.85 with a very valid category and a percentage match of the assessment of 96%, the content aspect with a score of 3.62 with a very valid category and a percentage of suitability of the assessment of 98%, aspects of characteristics get a score of 3.75

with a very valid category and the percentage of compatibility of the assessment is 93%, the closing aspect gets a score of 3.85 with a very valid category and the percentage of suitability of the assessment is 96%, and the last aspect of the elaboration of the concept gets a score of 3.70 with a very valid category and the percentage of suitability of the assessment by 90%. All aspects assessed are categorized as very valid (Ratumanan & Laurens, 2011) and the instrument developed is said to be reliable (Borich, 2015) or it can be said that the teaching materials of Indonesian students based on the Scientific Approach developed are very valid to be used by lecturers in the learning process to practice skills. communication.

2. Communication Skills Observation Sheet

The data from the development results were obtained by testing the development of student teaching materials in the Physics Education Study Program to train students' communication skills per group. The percentage of communication skills during three meetings using teaching materials developed based on the Scientific Approach to train students' communication skills per group is presented in Figure 3.1.
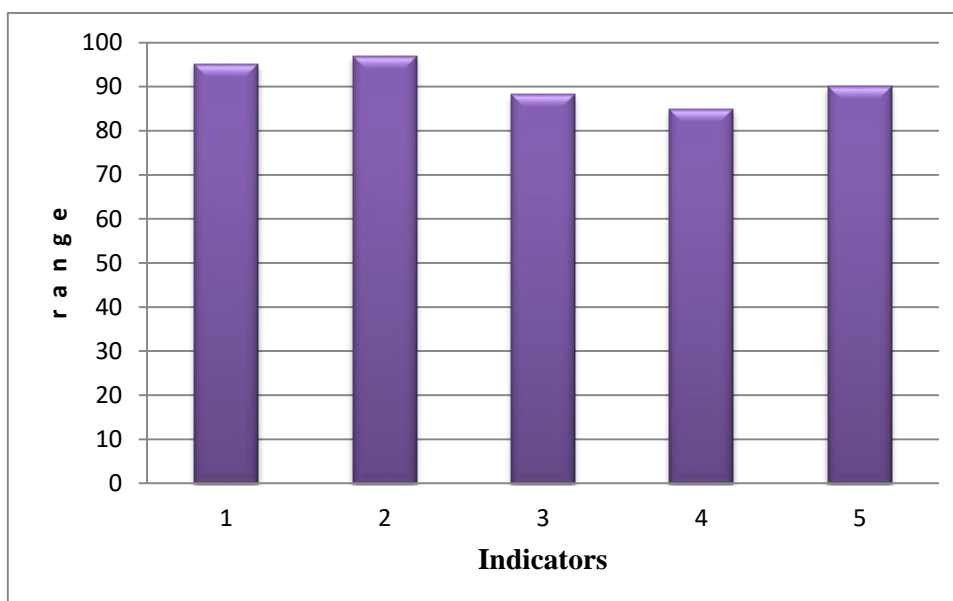

Figure 3.1 Communication Skills Values

Cangara (2007) says that communication is a person's ability to convey a message to an audience (the recipient of the message). Furthermore, according to Chatab (2007), communication skills are the ability to establish relationships through human communication channels or media, so that messages or information can be understood properly. Communication skills are not abilities that are innate and do not appear suddenly, skills need to be learned and trained (Supratikna, 1995). The communication skills trained in this study include (Ulfa, 2019): Multiplying information, Delivering material clearly, Expressing opinions, Ability to respond to information, and Asking questions.

Multiplying Information is divided into three sub-indicators, including the suitability of the topic with the information, the truth of the source, and the duration of the source of information. Multiplying the information got an average score of 95 thirds of the meeting with very good criteria. Delivering material is clearly divided into three sub-indicators, including the suitability of the material with scientific concepts, clarity of words/sentences, and intonation. Delivering the material clearly gets an average score of 97 thirds of the meeting with very good criteria. Expressing opinions is divided into three sub-indicators, including the ideas conveyed must be clear, do not offend the opinions of others, and the suitability of opinions with the topics discussed. Expressing an opinion gets an average score of 88.3 thirds of the meeting with very good criteria. The ability to respond to information is divided into three sub-indicators, including being able to accept input or different opinions, trying to solve problems, and being able to criticize other people's opinions without offending. The ability to respond to information gets an average score of 85 thirds of the meeting with very good criteria. Asking questions is divided into three sub-indicators, among others, questions must be on topic, questions do not cause double meaning, and questions must be clear. Asking questions gets an average score of 90 thirds of the meeting with very good criteria.

Indicators of communication skills obtained by students from the lowest percentage to the highest percentage include the ability to respond to information, express opinions, ask questions, collect information, and convey material clearly. The ability to respond to information is the lowest indicator because students are not used to sharpening their ability to solve problems and criticize their friends' arguments. Based on the descriptions above, communication skills obtained all indicators are included in the very good category (Arikunto, 2013).

3. Student Response

Student responses after teaching and learning activities using teaching materials based on a scientific approach were obtained using an instrument in the form of a questionnaire given by the 2020 Physics Education Study Program students with 26 students. The results of student responses to Indonesian language learning using a scientific approach to students of Department Physics Education can be seen in Figure 3.2.
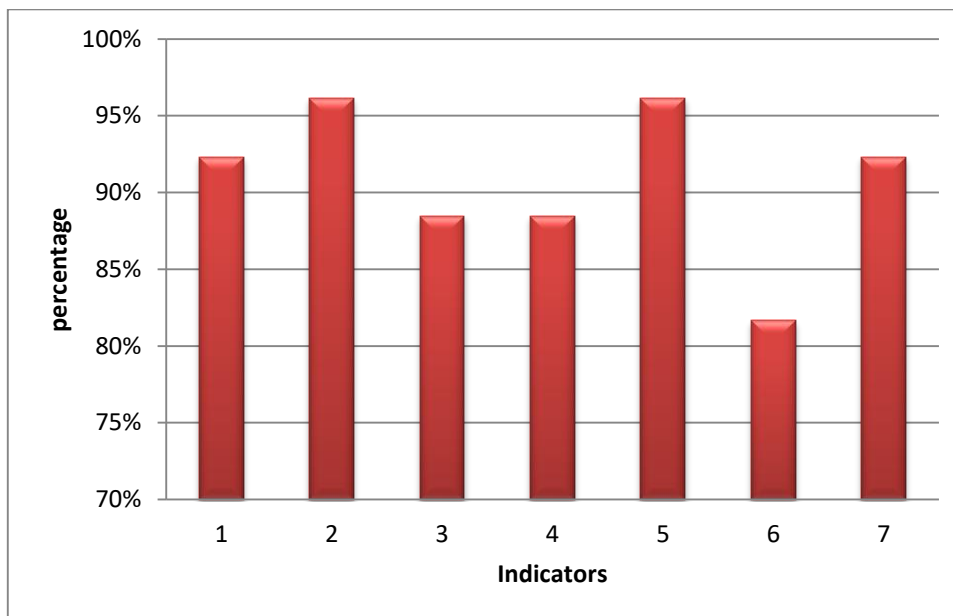

Figure 3.2 Student Response Percentage

The word of response according to the Big Indonesian Dictionary is defined as a response, reaction, or answer. Response or what is also called response according to Ahmadi (1991) is the result of impressions stored in one's memory and soul after making observations. Based on the above understanding, it can be seen that the response is a response or reaction which is defined as an impression or picture of the stimulus obtained or the previously observed object.

Student response to communication skills to multiply information is 92.31%. Student responses to communication skills convey the material clearly by 96.15%. Student responses to communication skills in expressing opinions are 88.46%. Student responses to communication skills, the ability to respond to information, are 88.46%. Student responses to communication skills asking questions amounted to 96.15%. Student responses to Indonesian language teaching materials were 81.69%. and Student response to lecturer's direction is 92.31%.

Students of the Physics Education Study Program with 26 students, the students' responses to learning using the Scientific Approach average the lowest percentage is that the teaching materials provided are very helpful and interesting to read, which is 81.69% with a very good assessment.
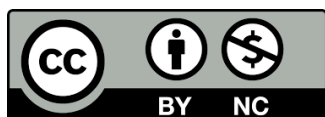
CONCLUSION

Based on the results and discussion, it can be concluded that the development of student teaching materials using a scientific approach can train the communication skills of students of the Physics Education Study Program. Based on the author's experience while conducting research, the authors suggest: Presumably the study in this paper is the first step that can be continued in more in-depth research on communion skills.

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