

Curriculum Development in College: Research and Development Study of Electronic Subjects for Indonesian Subjects at Muhammadiyah University of Makassar

Syafruddin^{1,*}, Abdul Rahman Rahim¹, Munirah¹, Syahrudin¹, Abdul Kadir², Muhammad Bakri³, Aziz Thaba⁴

¹Department of Language and Literature Education, Faculty of Teacher Training and Education, Muhammadiyah University of Makassar, Indonesia

²Department of Language and Literature Education, Faculty of Teacher Training and Education, Cokroaminoto College of Teacher Training and Education of Pinrang Regency, Indonesia

³Department of Language and Literature Education, Faculty of Teacher Training and Education Bosowa University of Makassar, Indonesia

⁴Matutu - Non-Governmental Education Research and Development, Makassar, Indonesia

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Abstract The purpose of this research and development is to produce teaching material products that are feasible and effective in the achievement of learning objectives. The product in question is electronic teaching materials in Indonesian. The feasibility testing technique used is expert judgment involving three experts to examine and assess the feasibility of teaching materials. There are four components which are assessed as feasible, namely the content or material of teaching materials, the presentation system, graphic design, and linguistic elements. Data analysis in this study used descriptive statistical techniques. The results of the research prove that the curriculum of the Indonesian Language course at the Muhammadiyah University of Makassar requires a serious evaluation through improving the quality of its teaching materials. The results of this research and development are output in the form of electronic teaching material products that have been tested for eligibility based on expert

judgment covering four components, namely the content or material, presentation, graphic or appearance, and language. In addition, the feasibility of teaching materials is also supported by the results of the trials. The product has been implemented in learning activities at Makassar Muhammadiyah University, and the results show that the Indonesian teaching material product was declared effective, with a significant increase in student learning outcomes.

Keywords Curriculum Development, Curriculum Reform, Teaching Materials, Learning Success

1. Introduction

The main problem that underlies this research is findings

related to the limitations of student learning materials. These limitations do not mean that there is no learning material but a lack of effort, low interest, and partly due to the economic limitations of students to get quality teaching material. Because, around the University of Muhammadiyah Makassar itself can be found several book figures who provide teaching materials related to Indonesian Language courses but at a high enough price. This cannot be forced, but rather there are responsibilities and obligations of each lecturer to overcome these problems. Lecturers must be able to design and develop their learning processes so that the objectives to be achieved can be realized according to the ideals of national education. This is as stated in the 1945 Constitution Article 31 paragraph 3 in Muspiroh (2014) that the government strives and organizes a national education system that enhances faith and piety and noble character to educate the life of the nation which is regulated by law. Furthermore, it is emphasized in the National Education System Law Number 20 the Year 2003 Article 40 Paragraph (2a) that education staff (lecturers) are required to have a professional commitment to improving the quality of education (Ramli, 2015). So, there is no longer any reason for educators, especially lecturers, to not think, do activities, be creative, and give birth to the latest innovations in order to fulfil these tasks and responsibilities. The task of developing teaching materials for lecturers is also regulated in Government Regulation (GR) No. 19 of 2005 Article 20 that lecturers are expected to develop learning materials or teaching materials and other supporting devices Sholeh (2017). The GR was emphasized through Permendiknas No. 41 of 2007 concerning Process Standards which read the planning of the learning process, which required lecturers to develop lesson plans Hasanah (2010). Thus, lecturers can no longer circumvent or avoid their obligations to develop teaching material.

Davis (2006) dan Villegas & Lucas (2002), in his writings, explained that educators in the current era are required to behave and think critically to advance the education curriculum. Thinking and being critical should have become a culture or a habit for them. However, Remillard & Bryans (2004) revealed that all of them would succeed if the orientation of the educator was in line with the policy of developing the education curriculum. Not by ignorance of the curriculum and the development of students.

The law in Indonesia explains in detail the instructional instructions for implementing the professional performance of lecturers, one of which is the development of educational processes and units as described in the National Education System Law Number 20 the Year 2003 Article 39 Paragraph (1) that the teaching staff is tasked with implementing administration, management, development, supervision, and technical services to

support education processes and units (Hakim, 2016). As stated Cronjé (2006) that the problem is the situation of lecturers or educators who do not understand and understand their tasks and functions as explained in the law.

Then, do you know the impact of the limitations of students in obtaining quality learning resources and the inability of lecturers to overcome this? The answer is the low quality of the learning process that impacts on the low student learning outcomes. Not only that, students' interest and motivation to learn become low. So that students do not show good enthusiasm because the source of learning is limited, so they are also limited knowledge. This problem can be found in Indonesian Language courses at Muhammadiyah University Makassar. The worst, this course has not been able to bring students to the ability to speak academically well.

The description of the Indonesian teaching materials used by students at the Muhammadiyah University of Makassar is a form of a draft prepared by lecturers by taking material from the internet. The draft is then neatly bound and then distributed to students as a guide for learning. Disseminated here is not a free gift but must be purchased at a high enough price, in terms of quality not guaranteed. Furthermore, students also use the internet as a learning resource. The description of the teaching materials does not meet the eligibility standards. Pendidikan (2006) and Yazid (2011) explain that the signs that must be obeyed in providing (developing) learning materials for students are to pay attention to their feasibility, effectiveness, and practicality. Borg & Gall (1983) also make the same point. According to them, the general procedure of an educational product that has been developed basically consists of two main objectives, namely: (1) developing a product, and then (2) testing the feasibility and effectiveness of the product in achieving its objectives.

In this study, reforming the education curriculum for Indonesian Language courses at the Muhammadiyah University of Makassar is an effort to improve the quality of the curriculum through teaching materials by examining or testing the appropriateness of teaching materials used by students. The test results are used as a reference in developing teaching materials products as a result of improvements from existing teaching materials. Solano - Flores & Nelson - Barber (2001) revealed that currently, a lot of learning material is used without going through stages of scientific testing or assessment so that the results generated from these materials are not truly scientific. (Solano - Flores & Nelson - Barber, 2001) revealed that before being used, learning material must really go through the stages of validity or feasibility testing so that the material becomes standardized. Hamsiah, Tang, Tolla, & Jufri (2017) states that the curriculum (teaching material) developed by educators (lecturers) must be measured for

eligibility through feasibility testing either conducted by experts or through a series of trials. In developing teaching materials, the design principles and development process used must follow national standards Reiser, Krajcik, Moje, & Marx (2003). According to the National Education Standards Agency (BSNP, 2006), the feasibility of teaching material is reviewed from the results of the assessment of several aspects including the content/material, presentation, graphics, and language.

Uchjana (1989) defines effectiveness as communication in which the process of achieving the planned objectives in accordance with the budgeted costs, the time determined and the number of personnel determined. Therefore, an indicator of effectiveness in the sense of achieving a predetermined goal or goal is a measurement in which a target has been achieved in accordance with what has been planned. Effectiveness is also defined as the power of messages to influence or the ability of messages to influence (Susanto, 1975). According to Susanto's understanding above, effectiveness can be interpreted as a measurement of the achievement of planned goals that have been planned in advance. According to Reigeluth (Yazid, 2011), an important aspect in the effectiveness (potential effect) of an instrument, theory, or model is knowing the level/degree of application of the theory, or model in a given situation. This level of effectiveness, according to Mager, is usually expressed by a numerical scale based on certain criteria. Related to the effectiveness of developing instruments, models, theories in the world of education, Van den Akker (1999) stated: "*Effectiveness refers to the extent that the experiences and outcomes with the intervention are consistent with the intended aims.*"

Kesidou & Roseman (2002) explain that a good curriculum is (a) motivating students to learn, (b) not making it difficult for students to learn, (c) supporting students to create scientific ideas through learning activities. These three concepts by Kesidou, S., & Roseman, J. E., can be used as a reference project for curriculum development in 2061. According to Lynch, Kuipers, Pyke, & Szesze (2005), a curriculum product must have measurable effects on the target subject. Lynch et al. explain that the effectiveness of curriculum products (teaching materials) is measured from the learning outcomes of students by comparing the increase in learning outcomes between learning outcomes before and after the application of the curriculum products. If the learning outcomes are consistently increasing from time to time, then the product can be said to be effective. The effectiveness of teaching material is usually seen from the potential effects in the form of quality of learning outcomes, attitudes, and motivation of students. According to Van den Akker (1999), There are two aspects of effectiveness that must be met by a teaching material, namely (1) Experts and practitioners based on their experience state that the teaching material is effective, (2) Operationally the

teaching material provides the expected results.

2. Method

The research method used is level three research and development (R&D), namely researching and developing existing products and then testing the feasibility and trial of the product. The development classification in this study is to improve the product of teaching materials that were previously used. The prototype of this new teaching material was developed by paying close attention to aspects that were judged to be weak or lacking in previous teaching materials such as material aspects, systematic presentation, grammar, and language. Based on the level of exploration, this research is descriptive. This research was conducted at Muhammadiyah University Makassar in the even semester of 2018-2019. Data collection techniques used were questionnaires and tests. To test the feasibility of teaching materials, a questionnaire was given to experts to be subsequently filled in based on the results of the examination of teaching materials. The data analysis technique used is descriptive statistical techniques. The trial was conducted by using teaching materials in learning than asking students for the subject of the test to determine the feasibility of teaching materials based on the results of the trial. The next step is to carry out implementation and evaluation. Implementation using experimental techniques. Experiments were conducted on 109 students. After the experiment is carried out, the effectiveness of teaching material is measured using a test technique.

3. Research Result

3.1. Description of the Feasibility of Pre-development Teaching Materials

Following are the results of the re-examination of the feasibility of pre-existing teaching materials from three experts. Aspects of teaching material being examined for eligibility are (1) content or material, (2) presentation system, (3) graphic design, and (4) linguistic elements.

Table 1. Results of material feasibility examination

Validator	Total Score	Percentage of Feasibility	Information
1	45	52.94%	Enough Feasible
2	41	48.23%	Less Feasible
3	47	55.29%	Enough Feasible
Average	44.33	48.82%	Less Feasible

From the above table, it is known that the total score of aspects of teaching material used by students prior to development is 44.33 (48.82%) of the ideal score of 85

which indicates that the teaching material is in the category of less feasible.

Table 2. Results of feasibility examination are presented

Validator	Total Score	Percentage of Feasibility	Information
1	34	52.30%	Less Feasible
2	34	52.30%	Less Feasible
3	36	55.38%	Less Feasible
Average	34.67	53.33	Less Feasible

From the table above, note that the total score of the presentation aspect of the teaching materials used by students before the development was 34.67 (53.33%) of the ideal score of 65 which indicates that the presentation of the instructional materials that are in the category of less feasible.

Table 3. Results of graphical feasibility examination

Validator	Total Score	Percentage of Feasibility	Information
1	72	55.38%	Enough Feasible
2	69	53.07%	Enough Feasible
3	72	55.38%	Enough Feasible
Average	71	55.38%	Enough Feasible

From the above table, it is known that the total score of the graphic aspects of teaching material used by students before development is 71 (53.33%) of the ideal score of 130 which indicates that the graphic system of teaching materials is in the category of quite feasible. In this study, the category of being sufficiently adequate did not meet the established standards, so the results of this assessment still concluded that the graphic aspects of teaching materials used by students prior to development were not declared feasible.

Table 4. Result of language feasibility examination

Validator	Total Score	Percentage of Feasibility	Information
1	33	55%	Enough Feasible
2	34	56.66%	Enough Feasible
3	34	56.66%	Enough Feasible
Average	33.67	56.11%	Enough Feasible

From the above table, it is known that the total score of the language aspects of teaching materials used by students before development is 33.67 (56.11%) of the ideal score of 60 which indicates that the language aspects of the teaching materials are in the category of quite feasible. In this study, the category of being decent enough does not meet the established standards, so the results of this assessment still

conclude that the language aspects of teaching materials used by students before development is not declared feasible

3.2. Description of the Appropriateness of Post-development Teaching Materials

After the results of the examination of teaching materials are known, the next step is development. The development of this research is an effort to improve the quality of teaching materials based on the results of the examination. That is, pre-existing teaching materials are evaluated and improved again to produce better or higher quality teaching material products. The aspects examined in teaching materials are the same as the examination of previous teaching materials, namely (1) content or material, (2) presentation system, (3) graphic design, and (4) linguistic elements.

Table 5. Results of feasibility examination of the post-development materials

Validator	Total Score	Percentage of Feasibility	Information
1	78	91.76%	Very Feasible
2	81	95.29%	Very Feasible
3	82	96.47%	Very Feasible
Average	80.33	94.51%	Very Feasible

From the table above, it is known that the total score of aspects of teaching material after development is 80 (94.51%) of the ideal score of 85 which indicates that the teaching material is in the category of very feasible.

Table 6. Results of feasibility examination of the post-development presentation

Validator	Total Score	Percentage of Feasibility	Information
1	60	92.30%	Very Feasible
2	60	92.30%	Very Feasible
3	61	93.84%	Very Feasible
Average	60.33	92.81%	Very Feasible

From the above table, it is known that the total score of aspects of the presentation of teaching materials after development is 60.33 (92.81%) of the ideal score of 65 which indicates that the presentation of the teaching materials is in the very feasible category.

Table 7. Results of the post-development graphical feasibility examination

Validator	Total Score	Percentage of Feasibility	Information
1	124	95.38%	Very Feasible
2	119	91.53%	Very Feasible
3	125	96.15%	Very Feasible
Average	122.67	94.35%	Very Feasible

From the table above, it is known that the total score of the instructional aspects of the teaching material after the development is 122.67 (94.35%) from the ideal score of 130 which indicates that the graphic management of the teaching material is in the category of very feasible.

Table 8. Post-development language feasibility examination results

Validator	Total Score	Percentage of Feasibility	Information
1	57	95%	Very Feasible
2	56	93.33%	Very Feasible
3	58	96.66%	Very Feasible
Average	57	95%	Very Feasible

From the table above, it is known that the total score of the language aspects of teaching materials after development is 57 (95%) of the ideal score of 60 which indicates that the graphic system of teaching materials is in the category of very feasible.

3.3. Description of Product Eligibility Based on an Assessment of Limited Trial Subjects

The trial was conducted on 25 students who were randomly selected. The test results are described as follows

Table 9. Frequency distribution of classifications of test subject responses

Interval	Category	Frequency	Percentage
30 and above	Very Feasible	20	80
24 – 29	Feasible	5	20
18 – 23	Enough Feasible	0	0
12 – 17	Less Feasible	0	0
11 and below	Not Feasible	0	0
Total		25	100

Based on table 9 above, it is known that the responses of test subjects have various tendencies. In this trial, 20 students who responded to teaching materials with a very feasible category, and five students responded to teaching materials with a feasible category. Meanwhile, there were no students who gave enough feasible, less feasible and not feasible responses to teaching materials.

The total response score of 25 test subjects was 781, with a percentage of 89, 25%. From the total score, it is assumed in the following interval table for the tendency of values.

Table 10. Broad classification interval of test subject responses

Interval	Interval of Percentage	Category
736 - 875	84,1% - 100%	Very Feasible
596 - 735	68.1% - 84 %	Feasible
456 - 595	52.1% - 68%	Enough Feasible
316 - 455	36.1 – 52%	Less Feasible
175 - 315	20% - 36%	Not Feasible

Table 10 above explains that the total score of 781 is at intervals of 736 - 875 (84, 1% - 100%) with the category "very feasible". Based on the results of the assessment of students as test subjects teaching material is declared feasible or can be implemented.

3.4. Description of Product Effectiveness Based on Learning Outcomes of Experimental Trial Subjects

To find out the effectiveness of the product, a comparison is made between the learning outcomes before the application of the product (pretest) and the learning outcomes after the application of the product (posttest). The results are as follows

Table 11. Frequency distribution of learning outcomes (*pretest*)

Data	Frequency	Cumulative Frequency	Percentage	P. Cumulative
7 – 8	0	0	0	0
9 – 10	1	1	0.9	0.9
11 – 12	12	13	11.1	12
13 – 14	36	49	33.1	45.1
15 – 16	42	91	38.5	83.6
17 – 18	17	108	15.5	99.1
19 – 20	1	109	0.9	100
Total	109		100	

Table 11 above shows the pretest learning outcomes of 109 student subjects. From this table, it is known that there are no students who get a score of 7-8, for a score of 9-10 obtained by one student with a percentage of 0,9%, a score of 11-12 obtained by 12 students with a percentage of 11,1%, a score of 13 - 14 obtained 36 students with a percentage of 33.1%, a score of 15-16 obtained 42 students with a percentage of 38.5%, a score of 17-18 obtained 17 students with a percentage of 15.5%, and for a score of 19-20 obtained one student with a percentage of 0,9%. The data of learning outcomes before treatment above presented in the following classification interval table to see trends.

Table 12. Classification of test results intervals (*pretest*)

Interval	Category	Frequency	Percentage
28 and above	Very High	0	0
19 – 27	High	1	0.91
13 – 18	Medium	96	88.07
7 – 12	Low	12	11.02
Six and below	Very Low	0	0
Total		109	100

Table 12 above shows the tendency of the pretest learning outcomes of 109 students to be subjected to extensive trials. From the table, it is known that there were no students whose learning outcomes were in the very high category, one person (0.91%) was in the high learning outcomes category, 96 people (88.07%) were in the high learning outcomes category, 12 people (11.02%) were in the category of learning outcomes are low, and nothing is netted with very low learning outcomes.

Table 13. Frequency distribution of learning outcomes (*posttest*)

Data	Frequency	Cumulative Frequency	Percent age	P. Cumulative
11 – 12	5	5	4.5	4.5
13 – 14	12	17	11.1	15.6
15 – 16	7	24	6.4	22
17 – 18	1	25	0.9	22.9
19 – 20	10	35	9.2	32.1
21 – 22	30	65	27.5	59.6
23 – 24	34	99	31.2	90.8
25 – 26	10	109	9.2	100
Total	109		100	

Table 13 above shows the posttest learning outcomes of 109 student subjects. From this table, it is known that five students who received a score of 11-12 with a percentage of 4.5%, for a score of 13-14 obtained 12 students with a percentage of 11,1%, a score of 15-16 obtained seven students with a percentage of 6,4%, a score of 17-18 was obtained by one student with a percentage of 0,9%, a score of 19-20 was obtained by ten students with a percentage of

9,2%, a score of 21-22 was obtained by 30 students with a percentage of 27,5%, a score of 23-24 34 students obtained with a percentage of 31.2%, and for a score of 25-26, there were ten students with a percentage of 9.2%.

Learning outcomes data after the treatment (treatment) above presented in the following classification interval table to see trends.

Table 14. Classification intervals of learning outcomes (*posttest*)

Interval	Category	Frequency	Percentage
28 and above	Very High	0	0
19 – 27	High	84	77.06
13 – 18	Medium	20	18.34
7 – 12	Low	5	4.60
Six and below	Very Low	0	0
Total		109	100

Table 14 above shows the tendency of posttest learning outcomes of 109 students who are subject to implementation. From the table, it is known that there were no students who netted learning outcomes in the very high category, 84 people (77.06%) were in the high learning outcomes category, 20 people (18,34%) were in the medium learning outcomes category, five people (4,60%) in the category of low learning outcomes, and no one netted with very low learning outcomes.

4. Discussion

Human culture, needs, and behaviour develop as the rate of development of the times. Likewise, in the world of education, the components that are in it must always develop towards a better direction with the times. One of these components is the curriculum. Therefore, researchers hoped that all parties involved or involved in the world of education must be able to position themselves as agents of change. In this case, the lecturer has a position as the main pillar of the change. Rutherford (1971), in his writings, revealed that in order to achieve educational reform in a better direction, the initial step that must be taken is to prepare the brain actors for educational reform. In this case, Rutherford positioned the role of educators (teachers or lecturers) as its main pillar. Therefore, it is not wrong if Kemenristek Dikti synergizes with university institutions strictly and seriously in developing the potential and skills of lecturers through various training programs both mandatory and supplementary in nature such as the Pekerti program, Applied Approach, Lesson Study, Workshop, etc. The important role of an educator in educational reform is also stated by Mbarushimana & Allida (2017) that educators have a very important role in changing the curriculum for the better. The forms of participation are planners, designers, agents of change, and evaluators.

After understanding the strategic role of a lecturer in

reforming the education curriculum, the question that must be answered is how to make the curriculum quality? Stabback (2016) in his paper entitled "What Make Quality Curriculum?" provides practical concepts on how to make the curriculum quality through evaluation procedures and ongoing curriculum development. According to Stabback, this effort will minimize the weaknesses that exist in the curriculum, then ultimately create a quality final curriculum product. This is what researchers are trying to carry out with research activities and development of educational curriculum tools, especially teaching materials in Indonesian language courses at Muhammadiyah University, Makassar. This research and development activity begins with a study of the problems contained in the curriculum. As a result, it is known that the quality of teaching materials used so far has not met the standards of eligibility both in terms of content, presentation, graphics, and language. In developing teaching materials, the design principles and development process used must follow national standards Reiser et al. (2003). Badan Standar Nasional Pendidikan (BSNP, 2006) explains that the criteria for good or proper teaching material are measured through the aspects of content, presentation, graphics, and language. If the four components have not been reached, the teaching material is not yet suitable for use. If this is avoided, it will have an impact on the learning process and student outcomes. This is indeed true, the survey results regarding the Muhammadiyah University Makassar's student satisfaction with the availability of learning facilities in the form of teaching materials showed that only 7% of students stated that they were quite satisfied and considered the teaching materials used in learning to be sufficient, 83% of students expressed less satisfaction and assessed the teaching materials that were used in inadequate learning, and another 10% expressed dissatisfaction with teaching materials because during the learning process the teaching materials were inadequate or did not meet student expectations. This has a direct impact on the quality of student learning processes and outcomes. The results of interviews with students confirmed that the lack of quality teaching materials disrupts interest and learning activities. Students find it difficult to explore the critical power of the material due to material resources that are not available. The result, during the learning process, students only play an active role as a listener and note-taker. In fact, it is expected that students are actively involved and participative in the whole series of learning. This problem is also the basis for consideration of development research that has been conducted by Sehe, Tolla, Kamaruddin, & Hamsa (2016), Irlidiya, Tolla, Noni, & Anshari (2015), Kamariah, Husain, Atmowardoyo, & Salija (2018), Suriaman, Rahman, & Noni (2018), (Hamsiah et al., 2017).

The impact of the problems experienced by students due to the unavailability of teaching materials is low learning outcomes. The impact of the problems experienced by students due to the unavailability of teaching materials is

the low learning outcomes, so emphasized that teaching materials are very important in their role in learning. Without teaching material, the direction of learning becomes uncertain so that it will be difficult to reach the goal. The results showed that the tendency of the pretest learning outcomes of 109 students who were subjected to implementation was that there were no students whose learning outcomes were in the very high category, only one person (0.91%) was in the category of high learning outcomes, 96 people (88.07%) were in the category learning outcomes are quite high, 12 people (11.02%) in the category of low learning outcomes, and no one netted with very low learning outcomes. If examined more closely, the figure of 88.07% for students with quite high learning outcomes is still far from expectations.

From the problems that have been described, a common thread is drawn that the Indonesian teaching materials used so far need to be improved through quality development activities. Quality improvement, in this case, is viewed from the aspect of the construction of teaching materials. The design of teaching materials developed is based on electronics. This electronic media selection consideration refers to the results of studies of some of the results of research development as conducted by Wahyudi (2012) that electronic-based teaching materials make it easier for students to understand learning materials, increase the atmosphere of activity, and improve student learning outcomes.

In development research, after the prototype of teaching materials is developed, the initial step taken is feasibility testing. Testing the feasibility of teaching materials involves experts and practitioners who are asked to read and examine the content and structure of teaching materials, including content, presentation, graphics, linguistic, and media carefully. This feasibility test is very important, Solano - Flores & Nelson - Barber (2001) revealed that currently, a lot of learning material is used without going through stages of scientific testing or assessment so that the results generated from these materials are not truly scientific. Therefore, before it is used, learning materials must really go through the stages of testing the validity or feasibility so that the material becomes standardized. This stage of a feasibility assessment is also carried out in research and development Rukayah, Tolla, & Ramly (2018), Sehe et al. (2016), Irlidiya et al. (2015), Kamariah et al. (2018), Suriaman et al. (2018), Hamsiah et al. (2017). Related to the feasibility of the developed curriculum instrument, Sugiyono (2013) explained that the instrument or device to be used in 1 particular population must go through a series of trials in a limited group to determine the level of validity. While Prastowo (2015) explained that one of the conditions that must be taken by educators in testing the feasibility of using teaching materials that were developed was through a series of trials on the subject (students).

Assessment of the feasibility of teaching materials is

carried out on an ongoing basis until declared valid by the validator. In this case, the teaching materials that have been developed by researchers are tested for eligibility in two stages. This is because, in the first assessment, there were still a number of weaknesses or errors that resulted in the validator giving the highest feasibility value to the category quite feasible. Meanwhile, the standard of the feasibility of teaching materials required at a minimum must be in the appropriate category and the maximum in the very feasible category. Therefore, all forms of weakness or error encountered in stage 1 assessment must be revised. Next, the revision results are checked again to find out the level of eligibility.

Furthermore, after the teaching material is declared feasible based on the results of the feasibility test by the expert, the teaching material must go through a trial phase. The trials are divided into two parts, namely limited trials and extensive trials. This trial is a prerequisite for teaching materials to be used in real learning. This is as determined by Dick, Carey, & Carey (2005) dan Borg & Gall (1983) through the development model he created. The results of the questionnaire on 25 students, the total score of the feasibility of teaching materials in the broad trial phase are 781 at intervals of 736 - 875 (84, 1% - 100%) in the "very feasible" category. Thus, the first condition of good teaching materials used in learning has been fulfilled, namely, the feasibility of being tested based on the results of the assessment and the results of the trial. Separate the two conditions, namely the effectiveness and practicality of teaching materials (BSNP, 2006). However, in this study practicality is not measured.

Learning is related to the acquisition, modification of knowledge, skills, strategies, beliefs, attitudes, and human behaviour (Schunk, 2012). By learning, humans try to change. Lecturers are the main actors who encourage change in students by learning. Therefore, the success of student learning itself is in the lecturers and curriculum. Taba (1962) in his book titled *Curriculum Development: Theory and Practice* proposes that there is a definite order in designing a rational and dynamic curriculum in which lecturers or educators must participate or be involved in the core in developing their own curriculum (grassroots approach) which is a representation of reality in the college high. This means that it is the lecturer who better understands his own learning environment, such as what he needs and the needs of students in learning. In this case, developing teaching materials conducted by lecturers is a demand given the students' need for better learning. For example, when a lecturer identifies the low student learning outcomes due to the poor quality of teaching materials used, the action that should be taken by the lecturer is to revise the weaknesses or weaknesses of the teaching materials or at the same time to create new teaching materials. So that is meant in development.

Related to the developed teaching material products, new stages are needed to find out the effectiveness of these

teaching materials. Because one of the main requirements of a teaching material that can be used is effective in achieving learning objectives. One of the learning goals is realized through learning outcomes. Talking about the use of teaching materials to make changes in student learning outcomes there are three possibilities that can occur, namely (1) the benefits of change occur in a short time, (2) the benefits of changes in a long time, and (3) the absence of benefits that occur (Ormrod in Arsyad, Rahman, & Ahmar, 2017). The effectiveness measure in this research and development, of the three possibilities, only refers to the first possibility. Because it is very effective when the benefits of an object (teaching material) can be seen or felt in a short time (fast). This is in line with the results of extensive trials of the development of Indonesian teaching materials for students at Muhammadiyah University Makassar.

The effectiveness of teaching materials is measured through learning outcomes and responses. First, the implementation of Indonesian electronic teaching materials can improve student learning outcomes. It is known that the number of students netted with high learning outcomes categories before treatment is only one person. However, after implementation, student learning outcomes netted in the high category increased significantly to 84 people. Student responses to the effectiveness of teaching materials show that teaching materials are very effectively used in learning. The total response score of 25 test subjects was 781 with a percentage of 89, 25 in the 736 - 875 interval (84, 1% - 100%) in the "very feasible" category.

Learning is a meaningful process. All components applied during the learning process will be recorded and internalized directly by the learner (Ansyar, 2017). Therefore, the good or bad of the process that is passed will be measured by the mind and heart of each participant learning. That is, when students take part in learning activities, they will automatically assess the learning components, such as the quality of teaching lecturers, class management, and even the quality of teaching materials used. Therefore, lecturers need to encourage or motivate students to learn. As the theory of learning behaviourism, that learning is the result of the encouragement of external events that lead to changes in observed human behaviour (Brown & Green, 2019).

Development of teaching materials has certainly been done by many previous researchers, especially Indonesian language teaching materials. However, this does not kill the motivation to work and the creativity of researchers to do the same thing but still puts forward the values of novelty (innovative) for the work that researchers create with work or teaching materials that have been there before. Based on these assumptions, the researcher realizes the importance of a systematic, empirical and logical process in realizing this research and development activity. Indonesian digital teaching materials are developed by looking at and considering the weaknesses in the previous

teaching materials, developed by analyzing the learning needs of students, and have gone through a series of feasibility tests. The presentation system of teaching materials is developed by referring to the weaknesses of the presentation found in the previous teaching materials, and then it has gone through a series of feasibility tests. In addition, the graphics of teaching materials are arranged systematically, harmoniously and are attractive to users. Furthermore, the language aspect of teaching materials has gone through a series of feasibility tests. The material aspect of teaching materials has met the readability standard. All the weaknesses in previous teaching materials have been avoided based on the results of expert and practitioner evaluations. This teaching material is presented in electronic form by utilizing AutoPlay digital media. Digital electronic technology-based learning is the demand of today's education world. This is as a form of adaptation to the rate of development of the times, especially in the era of the industrial revolution 4.0 or better known as the millennial era. Not only that, but the need for electronic teaching materials is also inevitable in view of the styles and characteristics of current student learning, all of which are indicated in technological progress. So, lecturers are always required to adapt and innovate with all their creativity to create a good professional climate

5. Conclusions

The Indonesian electronic teaching material that has been produced through Research and Development is present as an effort to improve the quality of teaching materials used at the Muhammadiyah University of Makassar. In the process of development, the teaching material has been through a series of due diligence and effectiveness, and the Indonesian electronic teaching material has a quality guarantee in accordance with good teaching material standards according to the National Education Standards Agency (BSNP).

The results of the feasibility test or the validity of the teaching material construction indicate that the components of the content or material, the presentation system, the graphics, and the language have met the ideal teaching material standards based on expert judgment. The appropriateness of the component content or material in the Scientific Writing teaching material means the accuracy and validity of the selection of standardized content or material and as it should be learned. Thus, students will really get the material in accordance with their learning needs. The feasibility of the components of the presentation of teaching materials for Scientific Writing means that all parts in the teaching materials meet the requirements and standards of arrangement in harmony. Thus, students will be easier, systematic, directed, and measurable in using teaching materials. Not only that, with a good arrangement or presentation, but students' interest

or motivation to use teaching materials will also be better too. The feasibility of graphic means that the graphic construction contained in the teaching material meets the harmonious and proportional standards so that the presentation structure is clear and systematic. That way, when this teaching material is used, the appearance will be a good centre of view for its users. The feasibility of language in teaching materials means teaching materials have good communicative power towards its users. Thus, if teaching materials are used by students, the contents or materials in them are easily understood by students.

The presence of Indonesian electronic teaching materials is able to overcome the problems faced by students, especially the low learning outcomes and student responses to teaching materials. This is evidenced by the results of the trial. Thus, this further clarifies the reliability of teaching materials to be used in learning to achieve goals based on their construction and operations. Indonesian-based electronic teaching materials are effectively used in learning to improve student learning outcomes. It is known that the number of students who were netted with high category learning outcomes prior to the implementation of teaching materials developed was only one person. However, after the implementation of teaching materials in Indonesian language learning, student learning outcomes netted in the high category increased significantly to 84 people. Student responses to the effectiveness of teaching materials show that teaching materials are very effectively used in learning.

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