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Evaluation Instrument Development for Scientific Writing Instruction with A Constructivism Approach

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Abstract. This study was conducted to develop evaluation instruments for scientific writing instruction with a constructivism approach. The development of evaluation instruments is important to provide valid and reliable measurement to measure the success rate of scientific writing instruction with a constructivism approach. In order to achieve these objectives, the combined models of development, i.e. 4D and RDR were used. The implementation of the development consisted of four stages, namely the preliminary study, define, design, and product development. The research data were in the form of quantitative and qualitative data and the data sources were the students, lecturers, practitioners, and experts in relevant fields of study. Data analysis technique was the domain technique and t test statistical technique for related samples. Based on the results, the obtained development product in the form of the evaluation of the instruction of writing scientific papers were valid and reliable. The development product consisted of four types of evaluation devices, the assessment rubrics, portfolios, observation sheets, and learning journal. Based on the results of the four development products, the effectiveness test was valid and reliable so that it can be used to conduct evaluation of learning to write scientific papers with constructivism approach, both for the evaluation of the process and the evaluation of the learning outcomes.

Keywords. development, evaluation instrument, learning, writing scientific composition, constructivism, development product

1. Introduction

Evaluation is a series of activities to acquire, analyze, and interpret data about the process and results of student learning which is done systematically and continuously, so that the result will give meaningful information in decision-making (Bachman, 1990) . The evaluation is done during and/or at the end of the the learning process. The focus of the evaluation is the student learning success in achieving competency standards and indicators of achievement that have been determined. Evaluation is an important part of learning (Tuckman, 1975).

With an evaluation, a lecturer as a manager of the learning process can determine the capabilities of the students, the suitability of the teaching methods used, and the success of students in achieving predetermined competence (Hart, 1994). Based on the evaluation, teachers can make appropriate decisions to determine what to do next. The evaluation results can also motivate students to perform better.

An evaluation should have a high principle of fairness (Ministry of National Education (MONE), 2008). That is, students are treated equally, thus it does not harm any one or group of students being evaluated. In addition, the evaluation does not distinguish between the social, economic, cultural, language, gender, and religious backgrounds. An evaluation is also a part of the educational process to encourage and motivate students to perform better in achieving the highest level according to their ability (MONE, 2008) .

By adhering to the important role of evaluation in the learning process, including the teaching of writing scientific composition, the instrument used to perform the evaluation process should be developed systematically and well-planned in order to accurately measure what should be measured (Djiwandono, 2008) . The instrument resulting from the development is called an evaluation instrument of development product. The evaluation instrument of development product is a valid and reliable instrument to be used because it has been through a series of tests, namely the practitioner test, expert test, a small group test, and large group test.

Pertaining to the issue that learning to write scientific compositions has an important role for the smoothness and completion of the student study in higher education (Wahab and Lestari, 1999), the evaluation instruments need to be developed. It was based on the results of preliminary studies that the existing evaluation instruments were still based on the traditional approach, lacking support in the implementation process and the achievement of learning outcomes, not being able to increase students' physical and psychological activity, and only measured the knowledge and skills of the students in writing scientific papers.

The evaluation instrument developed for writing scientific composition is oriented or based on a constructivism approach in line with the approach used in the learning process. The constructivism evaluation instrument is capable of stimulating students' learning by constructing the knowledge and skills learned by the students themselves through intensive interaction with the material, study groups, communities and the surrounding environment (Supriyadi, 2015). There are four types of evaluation instruments developed in this study, they are the assessment rubrics, portfolios, observation sheets, and learning journal.

The benefits that can be gained from the development of evaluation instruments of learning to write scientific papers is that the learning spirit of student can be improved by the increasing physical and psychological activity of the students; students are familiar with the learning patterns of constructing knowledge and skills learned independently; it makes students have sensitivity towards the material being studied, the study groups, the communities, and the environment; it makes students have a democratic attitude; tolerance; willing to give and accept the opinions of others; discipline, responsibility; honest, and other noble attitudes required in learning (Basuki , 2008). The development product can also help students in the learning process, as guidelines and learning resources that can assist them in learning to write scientific composition, and can develop the students' inspiration, motivation, creativity, productivity, and the power of reason in writing scientific compositions.

In addition, the product of this development can be beneficial to lecturers, book authors, as well as material and curriculum developers. The benefit for lecturers is that the product of this development can be used as a reference / guide for carrying out the process of learning to write scientific compositions and evaluation process with a constructivism approach. The benefit for authors of books / teaching materials is that this can be a sort of material to be considered in setting evaluation instrument of learning with a constructivism approach. The benefit for curriculum developers is that it is one of the inputs that the lecturers must do and for them to see the condition of the learning and evaluation needs in the field.

2. Research Method

The development model used in this study was Define, Design, Development, and Dissemination Model (Thiagarajan, et al., 1974) known by the acronym as 4D and Research Development Research (Borg & Gall, 2003) known by the acronym as RDR . The 4D model consisted of four activities, i.e. define, design, development, and dissemination or distribution activities. The dissemination activity was not carried out because of the dissemination process required a very broad sphere. Meanwhile, in the model of the RDR, there were three activities, namely the activities of a preliminary study, development, and implementation of effectiveness test.

The procedure of the development product was embodied in the form of activities. There were four activities carried out, i.e. preliminary study, define, design, and product development. The first activity—the preliminary study—was conducted to obtain early information about requirements, field conditions, and eligibility to develop evaluation instrument of learning. The preliminary study was also intended to set up the collaboration with the lecturers responsible for the course. The preliminary study results were used to design and develop products.

The second activity of the development process was conducting the determination. The determination activity was done by determining the product developed and establishing a participatory team. The determination is made to establish two things: the products developed and the establishment of a participatory team. First, the product developed was in the form of evaluation instrument of learning to write scientific papers with a constructivism approach. The product developed was packaged in the form of printed materials consisting of four types, namely the assessment rubrics, portfolios, observation sheets, and learning journal. Second, a participatory team whose members worked in the development process was formed. The team consisted of students, lecturers, practitioners, and experts in relevant fields of study.

The third activity of the development process was to perform product design. The product design process was done in collaboration with the lecturers and students. Product design began with a preliminary study or need analysis. A pilot study was conducted to obtain preliminary information on the situation and the condition of the field feasibility, the necessity and feasibility of development product. The preliminary studies were also conducted to explore collaboration with the lecturers and the students.

The fourth activity of the development process was to conduct the development of the product that had been designed. The development product process was done through four test stages, namely the practitioner test, the test of expert relevant to the field of study, the small group test with 8 students, and the large groups test with one class of students, comprising of 35 students.

The data source of this research was practitioners, specialists / experts, students, lecturers, and the learning process. Data from practitioners and experts were in the form of comments, criticisms, suggestions, corrections, and assessment of learning evaluation instrument products of scientific writing. Data from students were in the form of oral and written speech, behavior, attitudes of students in the learning process, and scores of scientific work of students before and after the learning process. Data from the lecturers were in the form of oral and written speech, behavior, attitudes in the learning process, learning evaluation instrument documents, comments, criticisms, suggestions, corrections, and assessment of learning evaluation instrument products write scientific papers. On the other hand, the data of the learning process at the time of testing were the effectiveness of a pattern of interaction between students and students, students with lecturers, students with material, student participation in the learning process, and reflecting on learning (Supriyadi, 2015).

The researcher acted as a major instrument in the implementation of the study. In carrying out his function the researcher were aided by instruments such as an observation guide of the learning process, a scoring guide, and guidelines for practitioners and experts assessment of the product. The observation guide was used to observe the learning process carried out by the lecturers with the students. The scoring guide was used to conduct scoring on the scientific work in the forms of the students' proposals, papers, and articles. Lastly, the practitioners and experts assessment guidelines were used to assess the development of the products by made by the practitioners and experts.

Data analysis were divided into three, namely data analysis of the results of expert and practitioner test, data analysis while testing the product, and data analysis of the results of product effectiveness test. The data analysis of practitioner testing, expert testing, field testing was done by using domain analysis (Supriyadi, 2015). The data were grouped by content, format, and language domains based on the evaluation instrument being developed, namely the assessment rubrics, portfolios, observation sheets, and learning journal. The data of each domain were reflected to draw conclusions on the outcome of the analysis. The conclusions based on the results of the analysis were used to revise the learning evaluation instrument to write scientific papers.

The data analysis of the product tryout was conducted on the students' speech, behavior, attitudes in the learning process, and the scientific work. In addition, the data analysis during field tryout was also conducted on the lecturers' speech, behavior, attitude in the learning process, learning evaluation, comments, criticisms, suggestions, corrections, and the lecturers' assessment on the product of evaluation instrument to write scientific papers. The results of the data analysis during the field tryout were used to revise the product on an ongoing basis to obtain a solid development product.

The data analysis of the product effectiveness testing was carried out by statistical analysis. The difference in scores of the pretest and posttest of the learning process using a development product was performed through dependent sample t test. The statistical data analysis of the product effectiveness test results was performed using SPSS 18.0 for Windows (Santoso, 2018).

3. Results And Discussion

This section presents the development process carried out to produce the development product which consists of the evaluation instrument types of assessment rubrics, portfolios, observation sheets, and learning journals used to evaluate the course of the learning process and learning outcomes. Detailed descriptions are as follows.

a. Development Process

The development of evaluation instrument with a constructivism approach was intended to improve the writing skills of the students in scientific composition. The development process was done in the second semester of the 2019/2020 academic year. The evaluation instrument developed was approved to be based on the adaptation of the evaluation instrument of learning by the Education Ministry in 2008, feedback from lecturers, the ease of implementation in the learning process, and the format indicating the learning with a constructivism approach. The evaluation process was carried out integratedly with the learning process to assess the implementation of the learning process and was carried out separately when used to evaluate learning outcomes in the form of scientific composition of students. The developed evaluation instrument for writing scientific papers was divided into four types, namely the assessment rubrics, portfolios, observation sheets, and learning journal as described as follows.

The first type of evaluation instrument of learning to write scientific papers was a scoring rubric. The rubric was developed to assess the scientific work of the students in the form of (scientific) papers whose implementation was separated from the learning process. Aspects of ratings were developed according to a number of indicators for the components assessed in the papers. There were five indicators, namely the title selection, the development of ideas / content, the organization of ideas / content, the presentation, and the use of scientific Indonesian. Each indicator was translated into a number of more detailed descriptors. Furthermore, each descriptor was given weight in the form of a score. The evaluation instrument of the assessment rubric type was developed in collaboration with the lecturers and on the basis of the increase of the students' scientific work quality. The evaluation which is carried out by using an assessment rubric can be used to direct students to improve certain parts of the scientific work in the form of papers meraka is still weak. This assessment rubric can also be used to determine the strengths and weaknesses of certain parts of the scientific work in the form of students' papers.

The second type of evaluation instrument of learning to write scientific papers was the portfolio. The portfolio was developed to evaluate the performance results of a student for one semester (second semester of academic year 2019/2020). As the assessment instruments, the use of the portfolio was focused on documentation of students performance, ie as evidence of everything done by the students during the semester. For lecturers, the portfolio could be used to record a lot of things about student progress in learning, such as the students' way of thinking, their understanding of learning materials, their ability to express ideas, their attitudes toward the subjects studied, and so forth. The portfolio assessment was not just a collection of student performance results, but a collection of student performance results purposely done to show the proof of competency, understanding, and the achievement of the students in a particular course. The portfolio was also a collection of information to be known by the lecturer as a material to be considered in determining the corrective measures or improvement of students' learning.

The portfolio in this study was a set of products of the students during the learning process of writing scientific papers. Realistically, the products were in the form of student performance results on every basic competence, the homework report, the observation reports of examples of scientific works, the group work report, and the work of students in the form of papers. The use of portfolios for assessment was very useful. This was based on a number of the following reasons: portfolio presented evidence that was clearer and more complete on student performance rather than the result of the test, the portfolio could provide assessment records that were appropriate with good learning program, the portfolio was a long-term record of the progress of student learning, the portfolio provided an overview on the ability of students in more comprehensive way, the use of portfolio assessment gave the students an opportunity to show their superiority, not flaws or mistakes in solving problems or doing tasks, the use of the portfolio reflects the recognition of the variety of learning styles of students, the portfolio provides the opportunity for students to play an active role in the assessment of learning outcomes, the use of the portfolio could help lecturers assess students' learning progress, the use of the portfolio could help lecturers make decisions about learning or improvement of learning, the portfolio was relatively complete material for the assessment, and the portfolio helped outsiders to assess learning programs concerned.

The evaluation instrument of portfolio type was developed based on the results of collaboration with supervising lecturers and on the basis of improving the quality of student writing scientific papers. The evaluation by using a portfolio could direct students to improve

certain parts of the students' scientific works (papers) that were still weak. The portfolios could also be used to determine the strengths and weaknesses of the learning styles of each student.

Furthermore, the third type of the evaluation instrument of learning to write scientific papers was the observation sheet. The observation sheet was developed to assess the aspects of the learning process. All the activities of the students during the learning process, both physical activity and mental activity could be evaluated using an evaluation instrument type of observation sheet.

The observation sheet was a reasonably important assessment instrument. The observation sheet was used to collect data on the affective aspects occurred within the students. The participation and initiative of students during the learning process, special attitude of students, and student responses in writing activities scientific work could be evaluated using this evaluation instrument of observation sheet. Observation sheet could also be used to record problems and developmental levels of students in mastering the learning material / content, students' attitude/ability to cooperate, the participation of the students, the ability to ask questions, or their interest in learning.

Observation is a method to record systematically about a person's behavior by observing the object, either directly or indirectly. Observations made should be able to obtain information properly, and the right observation techniques should be selected.

Recording the results of observations is generally much more difficult than recording answers responded by students to the questions given in a test. The recording of everything that can be seen in the observation is very important, because the results will be used as a basis for assessing the meaning contained behind student's behavior. The tangible guidelines for observation is one or some forms in which there are aspects, or behaviors that need to be observed and recorded at the time of the ongoing activities of the learning process of students.

Finally, the fourth type of the evaluation instrument of learning to write scientific papers was the learning journal. The learning journal was developed to help record the progress of students' learning, their mastery over the learning material, or their barriers when studying learning materials. The learning journal was made by students to record material that had been learned. The learning journal in this particular study was a kind of combination of lecture notes and a diary containing writings about the learning. The learning journal was used to record and summarize key material or the material being studied, including the feelings of the students in the study subjects, the difficulties or successes of students in solving a problem or finding a topic, or the notes or comments of whatever they found important to write. The content in the journal was very suitable as one of the things to complete as the learning evidence in the portfolio assessment.

The use of learning journals can help students to practice and develop the skills to write scientific papers. It can also help students study and prepare for examinations because learning journal can be used to increase student involvement in learning course materials, to clarify thoughts that are still vague, to help solve the problem, and to encourage students to think critically. When students write in journals, learning becomes theirs individually. Although journaling does not guarantee that all students will learn actively, but at least it will encourage them to actively learn the material of the course. Encouraging students to write a journal means forcing them to think and synthesize information, so they do not only passively wait for "the truth" from their lecturers. Journal writing time and focus can vary according to the needs of each student and academic purposes.

A learning journal helps students in learning the course material independently, ie, as a means of reflection and introspection. By filling the journals, students can practice thinking about why he did something. A learning journal can be used to jot down questions, to add

knowledge, to track record of success or disappointment. It can also be used to record the "history" of the learning process or completion of a work that reflects their growth in developing thinking skill or problem-solving skill. Students who do not have a learning journal tend to expeditiously complete the task in the form of a written assignment, so their tasks are quickly completed. Students who have a learning journal tend not to be like that because they will have a more thoughtful attitude towards the task of writing and in the course of time will be more careful in learning.

The evaluation instrument of the learning journal type was developed based on the results of collaboration with lecturers and on the basis of improving the quality of student learning to write scientific papers. An evaluation using a learning journal can direct students to improve the quality of their scientific work. A learning journal can also be used to determine the strengths and weaknesses of the learning styles of each student.

After the design process of evaluation instruments was completed, the next step was to carry out the practitioner test and expert test to enhance the development product of evaluation instruments. The process of testing was done to obtain proper and steady evaluation instruments. Collaboration with practitioners and experts was conducted to obtain input as much as possible. The practitioners appointed to conduct the validation were the lecturers of the Scientific Writing course. They were the ones who had the competence and skill in teaching to write scientific papers. The expert appointed to conduct the test was an expert of method of learning to write scientific papers (AMet), an expert of material / learning content of writing scientific papers (AMat), and an expert of evaluation of learning (AEv). The results of practitioner and expert test were in the form of comments, criticisms, suggestions, improvements, and assessment guidelines outlined in the assessment or transferred directly in the format of an evaluation instrument for strengthening the overall evaluation instruments.

The practitioners and experts were also given the authority to provide comments, criticism, suggestions, improvements, and valuation on other aspects outside the essential components of the learning evaluation instruments. Other aspects, such as font, consistency of terminology, physical appearance, graphics display, and lay out. The exposition of the practitioner and expert test results was then grouped based on the type of the evaluation instrument and the critical components in it. At the end, the practitioner and expert test results on other aspects of learning evaluation instruments were presented, such as font, consistent use of the terminology, physical appearance, display graphics, and lay out. The following is the further clarification.

Assessment rubric

Some components of the assessment rubric to which test process was applied were the selection of the title, the development of ideas / content, the organization of ideas/content, the presentation techniques, and the use of language. More test results are as follows.

1. Selection of titles

Table 1. Test Results of the Component of Titles Selection

No.	Data Source	Review Results
1.	Practitioner 1	Possibility position is swapped.
2.	Practitioner 2	The second and third descriptors seem confusing.
3.	Practitioner 3	The positions of the second and third descriptors should be swapped.
4.	MatEx	There is oddity in the second and third descriptors caused by the exchanged positions between the two.

5.	MetEx	Interchange the position of the second and third descriptors.
6.	EvEx	Pay attention to the re-positioning of the second and third descriptor, there are likely to be swapped.

As seen in Table1 above it can be stated that the elaboration of descriptors on the title selection component in the assessment rubric for the student paper is feasible. However, there are errors or swapped positions between the second and third descriptors, so the position needs to be interchanged. The assessment rubric of the student papers of the title selection component has been declared to be feasible and can be used to conduct the evaluation.

2. Development of Ideas / Content

Table 2. Test Results of Component of Ideas / Content Development

No.	Data Source	Review Results
1.	Practitioner 1	It is appropriate.
2.	Practitioner 2	It is appropriate.
3.	Practitioner 3	It is appropriate.
4.	MatEx	It is appropriate.
5.	MetEx	It is appropriate.
6.	EvEx	It is OK

As seen in Table 2, it can be noted that the elaboration of descriptors on component of ideas/content development on the assessment rubric of students' papers is feasible. It means that the rubric for evaluating the components of idea/content development in the students' papers can be used for the evaluation.

3. Organization ideas/content

Table 3. Test Results of Component of Ideas / Content Organization

No.	Data Source	Review Results
1.	Practitioner 1	It is appropriate.
2.	Practitioner 2	It is appropriate.
3.	Practitioner 3	It is appropriate.
4.	MatEx	It is appropriate.
5.	MetEx	It is appropriate.
6.	EvEx	It is OK

As seen in Table3 above, it can be concluded that the elaboration of descriptors in the components of the organization of ideas / content on the assessment rubric of students' paper is feasible, therefore, the assessment rubric of the students' papers on the components of ideas / content organization can already be used for the evaluation.

4. Presentation Technique

Table 4. Test Results of the Presentation Technique Component

No.	Data Source	Review Result
1.	Practitioner 1	It is appropriate.
2.	Practitioner 2	It is appropriate.
3.	Practitioner 3	It is appropriate.
4.	MatEx	It is appropriate.
5.	MetEx	It is appropriate.
6.	EvEx	It is OK.

As seen in Table 4, it can be concluded that the elaboration of the descriptors in presentation technique component on the assessment rubric of the students' paper is feasible. The assessment rubric of component of presentation technique of the students' papers can be used for the evaluation.

5. The use of language

Table 5. Test Results of the Component of Scientific Indonesian Usage

No.	Data Source	Review Result
1.	Practitioner 1	It is appropriate.
2.	Practitioner 2	It is appropriate.
3.	Practitioner 3	It is appropriate.
4.	MatEx	It is appropriate.
5.	MetEx	It is appropriate.
6.	EvEx	It is OK.

As seen in Table5, it can be concluded that the elaboration of descriptors of component of the scientific Indonesian usage on the assessment rubric of the students' paper is feasible. The assessment rubric of the student's paper on the scientific Indonesian usage components can be used for the evaluation. In general, it can be concluded that the assessment rubrics for development products are eligible and could be used to evaluate students' papers.

Evaluation Instrument of Portfolio Type

Some components of the evaluation instrument of the portfolio type that were tested are the portfolio identity, tasks and evidence gathered , and the conclusions and results of the evaluation.

1. Identity

Table 6. Test Results of the Portfolio Identity Component

No.	Data Source	Review Result
1.	Practitioner 1	It is appropriate.
2.	Practitioner 2	It is appropriate.
3.	Practitioner 3	It is appropriate.
4.	MatEx	It is appropriate.
5.	MetEx	It is appropriate.
6.	EvEx	It is OK.

As seen in Table 6 above, it can be stated that the component of portfolio identity of the assessment for paper writing by the students is already eligible. The component of this portfolio identity can be used to label portfolio to assess students' ability in writing papers.

2. Tasks and evidence to be collected

Table 7. Test Results of Tasks and Evidence of Portfolio Component

No.	Data Source	Review Result
1.	Practitioner 1	It is appropriate.
2.	Practitioner 2	It is appropriate.
3.	Practitioner 3	It is appropriate.
4.	MatEx	It is appropriate.
5.	MetEx	It is appropriate.
6.	EvEx	It is OK.

As seen in Table 7, it can be stated that the component of tasks and evidence gathered in the students' portfolio of paper writing skill assessment is feasible. The tasks and evidence components gathered in this portfolio can be used to assess the ability of the students in writing papers.

3. Conclusion of evaluation results

Table 8. Test Results of the Conclusion of Evaluation Result Component

No.	Data Source	Review Result
1.	Practitioner 1	It is appropriate.
2.	Practitioner 2	It is appropriate.
3.	Practitioner 3	It is appropriate.
4.	AMat	It is appropriate.
5.	AMet	It is appropriate.
6.	AEv	It is OK.

As seen in Table 8, it can be said that the component of evaluation result conclusion in the portfolio of the students' papers writing skill assessment is feasible. Overall, it can be concluded that the portfolio assessment of the students' ability in writing paper of this development product is eligible and can be used to carry out the evaluation.

Evaluation Instrument type Observation Sheet

Some components of the evaluation instrument of observation sheet type being tested are the identity, filling instructions, questions, and language. The explanation is as follows.

1. Identity

Table 9. Test Results of the Component of the Observation Sheet Identification

No.	Data Source	Review Result
1.	Practitioner 1	It is appropriate.
2.	Practitioner 2	It is appropriate.
3.	Practitioner 3	It is appropriate.
4.	MatEx	It is appropriate.
5.	MetEx	It is appropriate.
6.	EvEx	It is OK.

As seen in Table 9 above, it can be stated that the components of the identity of the learning process observation sheets to write scientific papers is feasible. The identity of observation sheet component then can be used to label the learning process observation sheets for writing scientific composition, particularly papers.

2. Filling Instructions

Table 10. The Test Results of Filling Instruction Components

No.	Data Source	Review Result
1.	Practitioner 1	It is appropriate.
2.	Practitioner 2	It is appropriate.
3.	Practitioner 3	It is appropriate.
4.	MatEx	It is appropriate.
5.	MetEx	It is appropriate.
6.	EvEx	It is OK.

As seen in Table 10 above, it can be concluded that the components of the filling instruction in the learning process observation sheets to write scientific papers by the students is feasible. It means that the component of filling instructions can be used as a guide to fill the observation sheet.

3. Questions

Table 11. Test Result of Questions Component

No.	Data Source	Review Result
1.	Practitioner 1	It is appropriate.
2.	Practitioner 2	It is appropriate.
3.	Practitioner 3	It is appropriate.
4.	MatEx	It is appropriate.
5.	MetEx	It is appropriate.
6.	EvEx	It is OK.

As seen in Table 11 above, it can be stated that the components of questions in the observation sheet of the process of learning to write scientific papers have been declared eligible and could be used to do observations .

4. Linguistic

Table 12. Test Result of Linguistic Component in the Observation Sheet

No.	Data Source	Review Result
1.	Practitioner 1	It is appropriate.
2.	Practitioner 2	It is appropriate.
3.	Practitioner 3	It is appropriate.
4.	MatEx	It is appropriate.
5.	MetEx	It is appropriate.
6.	EvEx	It is OK.

As seen in Table12, it can be concluded that the linguistic component in the learning process observation sheets for writing scientific papers has been declared eligible.

Evaluation Instrument of Learning Journal Type

Some components of the evaluation instrument of learning journal type being tested are the identity and reflecting on learning. Explanation of the test results is as follows.

1. Identity

Table 13. Test Result of the Identification Component

No.	Data Source	Review Result
1.	Practitioner 1	It is appropriate.
2.	Practitioner 2	It is appropriate.
3.	Practitioner 3	It is appropriate.
4.	MatEx	It is appropriate.
5.	MetEx	It is appropriate.
6.	EvEx	It is OK.

As seen in Table 13, it can be stated that the components of the identity of the learning journal is feasible and can be used to label learning journal.

2. Reflection of learning

Table 14 Test Results of Learning Reflection Component

No.	Data Source	Review Result
1.	Practitioner 1	It is appropriate.
2.	Practitioner 2	It is appropriate.
3.	Practitioner 3	It is appropriate.
4.	MatEx	It is appropriate.
5.	MetEx	It is appropriate.
6.	EvEx	It is OK.

As seen in Table 14, it can be noted that the reflection component in learning to write scientific papers is feasible and can be used for reflection of the learning process of writing scientific papers.

From the experts test activities, a number of entries were obtained, namely commentary, criticism, suggestions, improvements, and assessments. The practitioner and experts test results were utilized to revise the four learning evaluation instruments and their components. The four revised forms of learning evaluation instruments were, namely the assessment rubrics, portfolios, observation sheets, and learning journal which were all steady and ready to be test the learning evaluation instruments in the field.

The final development stage was the tryout of the evaluation instruments. The evaluation instrument tryout was conducted in collaboration with the lecturers and the students for the purpose of obtaining input from both the lecturers and students as much as possible for the perfection of development product.

The tryout of the evaluation instruments was implemented in two phases, namely the tryout in a small groups and in a large group. The tryout was conducted to obtain input as much as possible about the use of evaluation instruments in the learning process. Broadly speaking, the results of tryout of the evaluation instruments are described as follows. Firstly, in general, the evaluation instrument of the development products could be tested appropriately and could be implemented properly in the learning process. That is because the lecturers were involved in the drafting / designing evaluation instruments.

Secondly, a number of flaws were found in the evaluation instrument. The flaws were the typographical mistakes, inaccuracy in type of questions used to ask specific goals, the sentences were not clear, and the lack of the items used to ask questions about specific target.

Thirdly, there were things that needed to be considered by the lecturers in the teaching of scientific paper writing with a constructivism approach and its evaluation process. The lecturers should prepare the students' mental as good as possible. The students should be informed from the beginning that active participation in the learning process was the key demand and evaluated. The students were required to build their own knowledge and skills from the beginning in a series of writing scientific papers. The students were also required to interact with materials, peers, and sources for obtaining scientific knowledge.

Fourthly, it took relatively a lot of time in the implementation of teaching with a constructivism approach and the evaluation process. The learning with a constructivism approach required a series of concept exploration process until a final agreement to find a concept. So it takes a relatively lot of time to learn.

The revisions of evaluation instruments were performed each time the tryout at each meeting was completed. The revisions were done by reflecting and discussing together with the students and the lecturers. Based on the tryout results and reflections of the evaluation instruments, revisions were made to typing mistakes, inaccurate types of questions used to ask specific goals, unclear sentences, and the lack of items used to ask questions about specific target. The revised

learning evaluation instruments were also conducted on typing errors, inaccuracy in diction and terms used, deficiency in physical appearance, imperfection in graphical display, flaws in layout, formatting errors, mistakes in the content and language errors. The result of these enhancements was transferred directly into the revised evaluation instruments.

b. Development product

Evaluation is a series of activities to acquire, analyze, and interpret data about the process and results of student learning which is carried out systematically and continuously so that it will be meaningful information in decision making. The evaluation is done during the learning process or at the end of the learning process. The focus of the evaluation is the success of the students in achieving basic competence and the determined indicators of achievement.

Evaluation is an important part of learning. By conducting the evaluation, teachers can know the capabilities of the students, the accuracy of the learning methods used, and the success of students in achieving stipulated competence. Based on the evaluation, the teachers can make decisions appropriately to determine what to do next. The evaluation results can also provide motivation for students to perform better.

An evaluation should have a principle of fairness. Students are treated the same so it does not harm any one or group of students being evaluated. An evaluation does not distinguish between the social, economic, cultural, language, gender, and religion. An evaluation is also a part of the educational process to encourage and motivate students to perform better in order to achieve a high level according to his ability.

In terms of lecturers' professionalism, evaluation is one of the characteristics of professional lecturers. Professional lecturers always want feedback on the learning process they do. This is done because one of the indicators of the success of learning is determined by the level of success achieved by the students. Thus, the evaluation results can be used as a benchmark for the success of learning and feedback process for lecturers to improve the quality of their lessons.

In connection with the above description, in this study four instruments evaluation of learning were developed for the sake of ratings in order to improve the skills of students in scientific writing, as well as the quality of the process, and the quality of learning outcomes. The four instruments of such evaluation were the assessment rubric, portfolio, observation sheets, and learning journal that have the characteristics of constructivism. The development of the four evaluation instruments were based on a constructivism approach. That is, a constructivism approach is used as a reference in developing an evaluation instrument. The characteristics of the four developed evaluation instruments of learning referred to the evaluation of individual development product instrument. Each learning evaluation instrument developed has different characteristics.

First, the characteristics of the type of scoring rubric of evaluation instrument consist of five indicators with a number of descriptors and scoring weights. The evaluation instrument used to evaluate the quality of the scientific work of students consisted of five indicators, namely the title selection, development ideas/content, organization ideas / content, presentation techniques, and the use of language. Secondly, the characteristics of the type of portfolio evaluation instrument consisted of two components, namely the identity of a portfolio that included the objective, type of portfolio, semester, time frames, and the name of the student, and the contents of the portfolio that included tasks and evidence that had to be collected and concluded from evaluation results. Third, the characteristics of the type of evaluation instrument observation sheet consisted of three components, namely the identity of observation sheets, user manuals, and a list of questions. Lastly, the fourth, the characteristics of the type of

learning journal of evaluation instrument consists of two components, namely the identity of the journal and the reflection on learning.

The four learning evaluation instruments developed were based on the adaptation of the format of evaluation instrument by the Ministry of Education in 2008, the result of collaboration with lecturers advisers, examples of evaluation instruments of learning to write scientific papers, and their ease of implementation in the process of learner's, and the characteristics of learning with a constructivism approach. The characteristics of learning with a constructivism approach were seen from the authenticity of the four types of learning evaluation instruments when implemented in an integrated manner in the learning process. The evaluation of the learning process was carried out when students were participating actively in the learning process. The evaluation process was carried out in an integrated manner with the learning process and did not wait until the whole topic of learning was completely taught. The evaluation of the learning process was implemented using the evaluation instrument types of observation sheet and learning journal. The evaluation of the learning outcomes, ie scientific papers of the students was conducted by using the evaluation instrument types of assessment rubric and portfolio.

The learning evaluation instrument in this study was developed based on the basic competencies and indicator of success. It was intended that the evaluation of learning was none other than measuring the level of achievement of the basic competencies and indicators that had been set. The description of the learning evaluation instruments can be observed more completely in the development product evaluation instrument.

c. Effectiveness Test Products

The test of the effectiveness of the development product was intended for the purpose of obtaining information about the effectiveness of development product in the form of the evaluation instruments of learning to write scientific papers in the learning process. The effectiveness test was carried out by performing tests of students' different achievement before and after the learning process by using development product. The students' achievement in learning to write scientific papers was manifested in the form of score. The design was a single group pretest and posttest design.

Based on the statistical test was obtained information that there was a difference between the scores of the pretest and the posttest on the process and result evaluation of learning to write scientific papers that utilized development product . The differences in scores were significant. The average score of the pretest in composing paper was 75.16 and the average score of the posttes in composing paper was 88.64. The average score of through the employment of the treatment, namely the use of the development product was 13.48. The result of paired samples t test was significant (two tailed) $p = 0.000 < \alpha = 0.005$.

That means that there are significant differences between the scores of the pretest and the posttest. Based on the results of these calculations it appears that the use of development product in the evaluation process and learning to write scientific papers significantly influence learning achievements of students to write scientific papers . Thus, it can be concluded that there is an increase in learning achievement of the students' writing scientific papers significantly between before and after the learning process of the learning process.

4. Discussion

In connection with the results of the development presented earlier, in this study four learning evaluation instruments were developed to improve the writing skill of the students' in scientific work. The development of the evaluation instruments was based on a constructivism

approach (Bordner, 1986), meaning that the approach was used as a reference/guide in developing an evaluation instrument. The characteristics of the development of the evaluation instruments refer to each of the evaluation instruments. The characteristics of the evaluation instrument type of rubric consist of five indicators with a number of descriptors and scoring weights were used to evaluate the quality of the scientific work of the students. The five indicators were the title selection, the development of ideas/content, the organization of ideas / content, the presentation techniques, and the use of language. The characteristics of the type of portfolio evaluation instrument consists of two components, namely the identity of the portfolio, which included the contents of the portfolio tasks and evidence that must be collected and the conclusions of the evaluation results. The characteristics of the evaluation instrument type of observation sheet consisted of three components, namely the identity of the assessors, the evaluation instructions, and the list of questions relating to the observed target. The characteristics of learning evaluation instrument type of learning journal consisted of two components, namely the identity of the journal and the reflection. The reflection contained any of a number of questions used to carry out the process of the introspection towards the learning that had been implemented.

The spirit of constructivism in the evaluation instrument development product can be seen in all four types of the evaluation instruments when used in the learning process. The four evaluation instruments can be utilized to evaluate as well as to train students to develop the knowledge and skills being learned. In building the knowledge and skills to write scientific papers, the students can work together in study groups, be responsible for solving the tasks of learning, present the results of the work, ask questions, and reflection. All of them are learning processes that have the soul of constructivism approach (Pribadi, 2009). These four types of the evaluation instruments were developed by and for measuring process and result of learning to write scientific papers with a constructivism approach.

The learning evaluation instrument development was the result of adaptation of the format of an evaluation instrument by the Education Ministry in 2008, the feedback from lecturers, the ease of implementation in the learning process, and the format indicating the learning with a constructivism approach. The format indicating the constructivism learning approach was seen from the four types of learning evaluation instruments being developed. The format was designed to evaluate the process and outcomes of learning to write scientific papers that was integrated with the learning process so that the evaluation results could illustrate the overall ability of the students' academic potential. The evaluation of the learning process was implemented by using observation sheet type of the evaluation instruments and learned journals. The evaluation of the learning outcomes was implemented by using the section type of the evaluation instruments and portfolio assessment.

The development product of evaluation instrument was intended to improve the scientific writing skills of students and was designed for two types of evaluation; the learning process evaluation and the learning outcomes evaluation. The evaluation instrument to assess the learning process was embodied in the forms of observation sheets and learning journals, while the evaluation instrument to assess aspects of learning outcomes was embodied in the forms of assessment rubrics and portfolios .

Based on the effectiveness test, the development product in the form of four instruments evaluation of learning to write scientific papers was declared effective. The effectiveness test results was (2 tail) $p = 0.000 < \alpha = 0.005$. It signifies that the development product is appropriate to be used to perform evaluation activities, both for the evaluation of learning process and the evaluation of learning outcomes. The evaluation process was carried out during the process of learning to write scientific papers in progress, while the evaluation of

the results performed to evaluate the learning outcomes of the students in scientific writing was in the form of papers.

The first type of evaluation instrument was used to measure/assess the level of participation, creativity, cooperation, responsibility, and mental involvement (emotional intelligence, enthusiasm, interest) of students in the learning process. The first evaluation instruments were also used to evaluate the performance of the lecturers during the learning process. The evaluation of the lecturers was conducted on the aspects of their involvement in helping , assisting , facilitating , motivating , and directing students to achieve learning goals. The second type of evaluation instrument was used to measure/assess students' learning outcomes in the form of the final task of the learning process. The final task of the process of learning to compose scientific piece of writing was in the form of papers.

The utilization of both types of the evaluation instruments that can encourage the increased interaction and the final process of learning to write scientific papers of the students . The utilization of the first type of the evaluation instruments can increase the intensity and quality of the students' work, their level of participation, creativity, cooperation, responsibility, involvement, psychological, ie, emotion, intelligence, enthusiasm, talents, and interests in the learning process. the utilization of the second type of the evaluation instruments is to improve the quality of the work in the form of student papers. Djwandono (2008) also suggests the use of instruments of evaluation process and evaluation of learning outcomes to improve the achievement of students. Thus, the estuary is the increasing in the students' scientific work writing skills .

This development product of evaluation instruments is used to motivate and improve learning outcomes of students in writing scientific papers . As stated up front that the evaluation instrument of learning process and results can be used to improve student achievement, especially the learning process evaluation instrument designed according to students' interests. The portfolio evaluation instrument, for example can be used to motivate student learning by collecting artifacts or the performance of students as many as possible into the portfolio document to complete learning tasks Likewise is applied for evaluation instrument types of observation sheet and learning journal.

The evaluation instrument of the development products can also be used as a guide for the learning process to write scientific papers. The process of learning to write scientific papers needs to be guided or needs specific guidelines to facilitate the students so that their skills in writing scientific papers continue to rise. That is, the steps to write scientific papers by the students are evaluated so that it can run properly in accordance with the procedure. The evaluation instrument of the development product is feasible to use as a guide for students in writing scientific papers.

These four types of the evaluation instrument of the development product can be used to guide students in writing scientific papers step by step. The portfolio evaluation instrument type, for example, is in the form of document collection of all the results of students' performance done step by step in writing scientific papers. When all the steps have been completed and all the tasks are collected in the portfolio file, the student has completed all the stages in writing scientific papers. Similar to the portfolio, the evaluation instrument type of assessment rubric contains a number of indicators that can lead the students in writing scientific papers properly.

In the evaluation instrument type of the observation sheet, there are components of student activity and lecturer activity in the learning process that need to be evaluated. The evaluation instrument type of observation sheet is used to record all activities in the forms of student participation, both physical and mental activity. The observation sheet is also used to

record all activities of the lecturers during the learning process. It is expected that based on the results of the recording the complete implementation of the learning process can be identified in order to see the strengths and weaknesses that might arise. The result of recorded learning process is one of the reflection materials to improve the implementation of the learning process at the subsequent meetings. On the other hand, the evaluation instrument type of the learning journal is a form of reflection of the implementation of the learning process of each meeting and at the end of the semester. The learning journal is intended to trace the entire process of the learning to see the strength and weaknesses (Hubbard, 1999).

In relation to that matter, there are five similar studies on the importance of developing evaluation instrument to improve writing skills, process quality, and the quality of learning outcomes that support this development study, namely the studies by Yuni Pratiwi (2005), Sugit Zulianto (2007), Sukirno (2008), Endah Tri Priyatni (2011), and Kastam Syamsi (2011). The results of the five studies are as follows. Yuni Pratiwi (2005) examined the problems of the evaluation instrument of the development model of literary appreciation for moral values education based on contextual approach for junior high school students. Based on the research findings it can be argued that the development products can be used to improve the skills of literary appreciation, moral values, and language skills, both oral and written language for students of SMP.

Zulianto (2007) revealed the issues of the importance of the learning evaluation instrument development with the process approach in teaching writing arguments for junior high school students. He found that learning evaluation instrument of the development products could be used to improve the writing skills of argument and improving learning achievement write arguments for junior high school students.

Sukirno (2008) revealed the issues of the importance of development evaluation instrument with the quantum learning strategy in teaching narrative writing for high school students. He also found that learning evaluation instrument of the development products could be used to improve the skills of narrative writing and improving learning achievement of narrative writing for high school students.

Endah Tri Priyatni (2011) examined the problem of developing a learning evaluation instrument of critical reading with responsive-intervention-based by using multimedia. The results showed that the learning evaluation instrument of the responsive-intervention-based critical reading with multimedia could improve the eight core skills of critical thinking of the students. The eight core skills of critical thinking are the skills of focusing, gathering information, remembering, organizing, analyzing, generalizing, integrating, and evaluating.

Kastam Syamsi (2011) examined the problem of developing learning evaluation instrument of writing with a process - genre approach for junior high school students. The results showed that learning evaluation instrument of the development products could be used to improve the writing skills of various genres for junior high school students.

In relation to those studies, there are differences in the approach used as the basis for the development of learning in the fifth evaluation instrument that research in this study. In the development of learning evaluation instrument, the constructivism approach was used in this study as the basis. It can be stated that although researchers use different approaches to develop evaluation instrument learning, but the point has relevance in terms of the function, namely improving the skills of literary appreciation, increasing the moral values of students, improving writing skills, improving the skills of critical reading, improving reasoning power of students, and improving the quality of the process and the quality of learning outcomes.

Conclusion

In this development research, the evaluation instruments of learning to write scientific papers with a constructivism approach were resulted. The evaluation instruments developed consisted of four types, namely the assessment rubrics, portfolios, observation sheet, and learning journal. The evaluation instrument types of assesment rubric and portfolio assessment were used to evaluate student performance results, while the evaluation instrument types of observation sheets and learning journals were used to evaluate the implementation of the learning process.

These four types of the evaluation instruments were said to be reliable and valid because it had been through a series of tests, namely the practitioner test, expert tests, and field test. The practitioner test was conducted by the lecturer of the Scientific Writing course, the expert tests were carried out by the teaching method expert, subject matter experts, and learning evaluation expert, and the field tests are applied in small groups and large groups of students. Similarly, based on the results of the effectiveness testing of the development product they were declared to be effective.

This proves that the development product is essentially valid and effective and can be used to evaluate the learning of scientific writing, both the learning process and the learning outcome. The valid and effective development product can also be used to create the learning process that is capable of cultivating the sense of responsibility, mutual respect, mutual giving and receiving opinions of others, togetherness, honesty, exemplary, mutual help, mutual trust, tolerance, transparency, and democratic.

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