DEVELOPMENT OF A MOOC BASED ON MICROLEARNING FOR WRITING RESEARCH ARTICLES FOR STUDENTS

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Abstract

The development of courses in MOOCs is the goal of this research for scientific writing methods courses. This development is based on the need for technical and practicality in writing research results by students undertaking final microlearning assignments. Development was carried out by referring to the Dick and Carey model, which refers to the development of instructional design. The instructional design developed is in the form of course content and activities designed for the MOOC. As a result, creating a scientific writing methods course can be achieved with decent results from expert validation and user testing. This course consists of eight meetings with various content and learning activities referring to the microlearning basis used, with the participant's output being the publication of a research paper.

Keywords: *MOOC, scientific writing, microlearning*

INTRODUCTION

MOOC content development indicates higher education performance in providing quality education. MOOC includes learning resources and facilities with the principle of openness in terms of accessibility, thereby allowing for greater involvement of participants or students (Pursel et al., 2016). This is why many MOOC developments have opened opportunities for the wider community to learn non-formally in various educational institutions (de Moura et al., 2021).

MOOC has the advantage of providing broader and more efficient learning resources, especially in terms of cost, time, and place. This is the reason why MOOC development itself has been widely researched. Previous research shows that MOOCs represent a digital learning trend for providing free and open access to various content and learning activities through different updated platforms (Baturay, 2015). Providing multiple learning resources is a challenge in implementing MOOCs, considering that the basis is independent online learning, so the design must pay attention to the needs of the participants, not too many or too short in presenting the content and activities (Veletsianos & Shepherdson, 2016).

This research proposes MOOC content development assignments according to performance indicator targets by conducting a needs analysis related to the courses to be designed. Based on the needs analysis results for 2022 from students

and the general public, the method of writing scientific papers is the chosen course content. The needs analysis results show that many students still have difficulty writing research reports and articles. Similar findings were found in elementary school teachers and educational practitioners who still had trouble writing scientific papers. Difficulties arise not only in the writing results but also in the lack of mastery and understanding of the techniques for writing each part of scientific writing, such as the background, discussion, and references (Rini et al., 2023).

Based on this need, this research designed the development of MOOC content to write scientific papers based on microlearning. Microlearning creates various sets of more complex teaching materials in the form of videos, presentation slides, handouts, and others to be more flexible with the application of different teaching methods during learning (Díaz Redondo et al., 2021; Sirwan Mohammed et al., 2018). Microlearning also emphasizes presenting learning content and activities that are shorter, concise, concise, or to the point on the primary material that participants must master and achieve (Wang et al., 2020).

Apart from that, the micro-learning basis is also considered to follow MOOC characteristics, referring to the results of previous research to design learning in sixteen meetings (Javorcik et al., 2023; Javorcik & Polasek, 2018). From this rationalization, the research objective was to develop MOOC content for micro-learning-based writing methods. This development is expected to provide lighter and more effective learning facilities for students in scientific writing, especially for students taking their final assignments.

METHOD

This development research was carried out using the instructional development model from Dick & Carey (1983), which has eight systematic steps. This model was chosen considering the integrity of the steps and the process of improvement which can be taken in stages. From the eight steps, the research procedure was formulated as follows.

1. The first stage, identify learning objectives by analyzing course achievements for the research article writing method. At this stage, a needs analysis is carried out for developing MOOC content using document analysis and learning observations in the Scientific Writing Methods course.
2. The second stage is formulating general and specific objectives in developing MOOC content as student teaching materials in teaching Scientific Writing Methods.
3. The third stage is developing products according to the objectives and results of the needs analysis related to selecting instructional designs according to the

characteristics of students as learners and the more practical Scientific Writing Methods course.

4. The fourth stage is to formulate learning strategies that will be applied in MOOC content design by adapting to the approach to teaching beginning reading.

5. The fifth stage is designing materials for implementing MOOC content in supporting teaching modules for lecturers and students in teaching beginning reading. Experts then validate the product before it is executed for user trials.

6. The sixth stage is designing user trials with a design to determine the feasibility criteria for the product being developed.

7. The seventh stage carries out a formative evaluation of the overall results of the research implementation related to the achievement of learning objectives and the quality of the products developed.

8. In the eighth stage, carry out a comprehensive product revision based on the formative evaluation results according to the criteria achieved and product trial results. From this stage, the final product of this development research is produced.

Data collection in this research was carried out using several techniques consisting of (a) questionnaires, (b) field notes, tests, and (c) documentation. The questionnaire will test validity with experts and product trials with users. The data in this research was processed using quantitative and qualitative descriptive techniques. Quantitative descriptive analysis is used to process assessment data resulting from expert validation and user testing with percentage formulas and product feasibility interpretation criteria in Table 1.

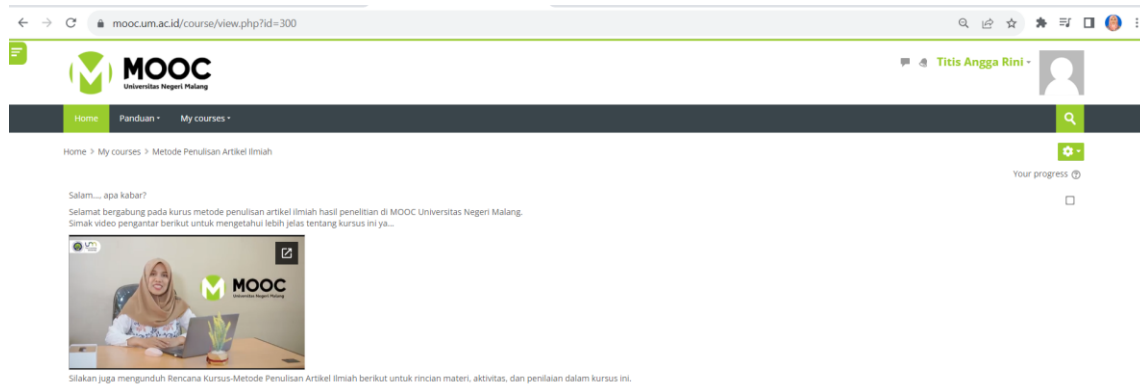| Scale	Percentage	Qualification
5	91-100	Very decent, no revisions
4	81-90	Decent, without revision
3	71-80	Enough minor revisions
2	61-70	Less major revision
1	<61	No, major revision

Table 1. Product Qualification Result

RESULT AND DISCUSSION

1. Product Description

MOOC content development for Scientific Writing Methods courses was designed in eight meetings. This consideration refers to the use of MOOCs that are more practical in nature and short courses to deepen user material or skills—

adapting to the Scientific Article Writing Methods course, which is aimed at providing theoretical and practical mastery in writing scientific articles as one of the mandatory outcomes of conducting research for educational practitioners including students. Adapting to this goal, MOOC content was developed for the Scientific Writing Method courses based on project-based learning following the reference for using learning methods for developing life-based approaches. From the results of this design, MOOC content was developed, as shown in Picture 1.

Picture 1. MOOC Display for Scientific Writing Method Course

2. Product Validation

From the products that have been developed, the MOOC course design and materials were validated by experts in the field of education, especially those with expertise in writing scientific papers, with the results described in Table 2. The results of validation with experts showed that the product showed appropriate criteria without revision (84%) for use in MOOC courses in terms of course design and materials developed. From the results of this expert validation, suggestions were obtained to further condense the theoretical material in writing research articles and increase independent or practical practice in writing research articles, especially in the case of scientific publications that refer to the achievement of research outputs.

Numb	Indicators	Score
1.	Content	
	MOOC content is developed according to learning outcomes in writing scientific articles	4
	The MOOC content developed includes the application of microlearning	4
2.	Target	
	The MOOC content developed is suitable for use by students/academics/practitioners	4
	The MOOC content developed is output-oriented in the form of research	4

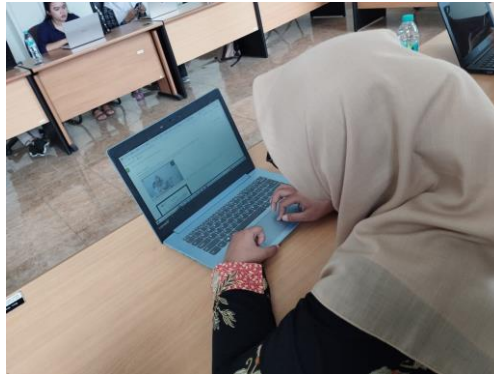|			
	articles		
3.	Language		
	MOOC content is developed in concise and communicative language		5
	MOOC content is developed to meet EYD grammar		4
4.	Presentation		
	MOOC content consists of various digital lecture content and teaching materials		5
	MOOC content is presented in a format compatible with the LMS system		4
5.	Practicality		
	The MOOC content developed has the flexibility of time and device access		4
	The MOOC content developed is of the right size and duration		4
		Mean	**4,2**
		Percentage	**84%**
		Qualification	**Decent**

Table 2. Expert Validation Result

3. *User Test Results*

Referring to the validation results, the resulting product was implemented in a MOOC course for user testing involving students from the class of 2020 undertaking their final thesis assignments in the PGSD Undergraduate Study Program in the Odd Semester 2023/2024 on a limited scale. The user test was carried out from September 25 to October 5, 2023, for meetings 1-8 according to the RPS design with the following activity description.

The first meeting was held face-to-face to convey the activity objectives and the material's orientation according to the course design. This meeting involved ten students who were preparing their theses in the form of research articles before taking the final exam. To access the MOOC course, students engaged in the trial must first register with the UM MOOC admin to get a username and password as a course participant. This access is being further developed to make it easier to write participants in general.

After gaining this access, participants can observe the entire series of courses according to the design and conditions listed. In the method course for writing research articles in this MOOC, a project basis is used so that to be able to access the next meeting, participants must complete the initial meeting first with Restricted settings marked with a dotted box (participants must complete the activity) and activity completion is marked with a description of what action the participant must meet to open the following exercise as a control of the participant's completeness in taking the course shown in Picture 2. From the results of this user test, an assessment was obtained from participants, which showed that the MOOC being developed was feasible in terms of content, objectives, presentation, language, and practicality (84%) in Table 3.

Picture 2. Participant Access for the MOOC Course

Numb	Indicators	Score
1.	Content	
	MOOC content contains theoretical material for writing research articles	**4,75**
	MOOC content contains practical material for writing research articles	**4,5**
2.	Target	
	The MOOC content developed is suitable for use in lectures or training	**4,5**
	The MOOC content developed includes the activity of writing research articles	**4,5**
3.	Language	
	MOOC content is developed in concise and communicative language	**3,75**
	MOOC content is developed to meet EYD grammar	**4**
4.	Presentation	
	MOOC content consists of various digital lecture material formats	**4,25**
	MOOC content is presented in a format that is compatible with the LMS system	**4**
5.	Practicality	
	The MOOC content developed has easy access	**4**
	The MOOC content developed is of the right size and duration	**3,75**
	Mean	**4,2**
	Percentage	**84%**
	Qualification	**Decent**

Table 3. User Trial Result

In this trial, suggestions were also obtained from students as course participants. First, adding practice questions helps participants practice more from mistakes in writing research articles. Second, material packaged in the form of microlearning is easier and more attractive to present in infographics and short explanatory videos than in the form of handouts. Third, the presentation of the self-writing assessment instrument can be made collaborative so that participants can learn from mistakes and experiences in writing research articles.

4. Discussion

The MOOC development in this research is one of the electronic-based open-access learning media for general users. Various educational institutions have developed MOOCs to increase the digitalization of learning more efficiently in

terms of cost, place, and time (Mellati & Khademi, 2020). In this research, the MOOC developed was a Methods for Writing Research Articles course, one that academics and educational practitioners must take regarding research output obligations (Cargill & O'Connor, 2021).

The results of the development carried out are course designs in the form of RPS as well as content or materials, which are then integrated into MOOCs, which are used based on Moodle in the learning management system. The development of this course in an MOOC has been validated and tested on users with decent results after several improvements to the content or material. The microlearning base is implemented through various media and teaching materials presented concisely, concisely, and concisely (Leong et al., 2021).

This MOOC development result also underlies the design in the eight meetings used in the course for the short term. In line with this design, project-based learning is also directed at giving course participants more practice writing research articles. The project used is an independent project which, in the process, also involves collaboration between participants in various experiences with the aim of participants being able to learn from each other's mistakes and strengths in writing (Rini & Cahyanto, 2020)

Apart from developing the material, which is designed in such a way, the MOOC also requires good motivation and awareness of learning from the participants. MOOC courses are intended as open learning sources, so learning is mainly dominated by online asynchronous activities (Zhu, 2021). Participants must complete a series of actions and achieve the required grade to graduate from the course (Reparaz et al., 2020). For example, participants will produce research papers to be published in journals or scientific proceedings.

CONCLUSION

From this research, it can be concluded that the development of the MOOC for the Research Article Writing Methods course has been implemented and achieved following the targeted objectives. This MOOC course was successfully developed on a microlearning basis as demonstrated by various materials presented in the form of visual, audio, or a combination of both: infographics, explanatory videos, handouts, assessment instruments, and others. The results of expert validation and user testing show that this course in MOOC is suitable for use after final refinement based on the suggestions provided (obtained an average assessment score of 4 with a percentage of 84%).

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