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Research Article

Debriefing Program of Digital Literacy-oriented Teaching Material Development for Prospective Physics Teacher Students in the MBKM-Teaching Assistant Program

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Abstract.
This study aims to develop a debriefing program for prospective physics teacher students in order to develop digital literacy-oriented learning tools through the independent learning campus program - teaching assistance program (MBKM - Teaching Assistance Program). One of the converted courses in the teaching assistant program is the development of learning tools. The debriefing model given to students is in the form of project-based debriefing. The Reeves design-based research (DBR) model was used as the research design, and the data were processed descriptively. A field needs analysis was conducted on students who had taught in schools through the analysis of learning aids and questionnaires. The participants in this study were 18 students who are prospective physics teachers and also members of the Teaching Assistance Program. The research stages are needs analysis, curriculum analysis, lesson plan design for material analysis, and learning assessment. All forms of project-based assignments were directed at the development of digital literacy-oriented teaching materials. The results of the research were in the form of stages of debriefing, debriefing materials, and procedures for application debriefing programs. In addition, the results of the limited trial showed that students tend to have digital literacy skills in the medium category. They are already proficient with several applications in designing interesting and correct teaching materials.

Keywords: digital literacy, prospective physics teacher, MBKM-teaching

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1. INTRODUCTION

The teacher is one of the professional fields of work that requires expertise in carrying out the profession. The results of the teacher competency test that have been carried out since 2015 show that the pedagogical competence of teachers is low and places the Educational Institution and Education Personnel as the institution most responsible for the problem of the low competence of teachers [1, 2] This finding indicates that the professional development of teachers still needs to be improved. To become professional, teacher educators need to be exposed to some experience with conceptual and practical knowledge about teaching and learning how to teach well. The relationship between these two experiences and practices is framed in a coherent curriculum and program to be linked to graduate outcomes of teacher education [3].

Mansfield, Beltman, Broadley & Weatherby-Fell state that teacher resilience can be caused by four factors, namely: 1) Teacher resources (such as: motivation, belief, purpose, optimism, social competence, and emotional), 2) Contextual or environmental aspects (such as: school leadership, co-workers, student relations, and school culture), 3) Strategies (such as: balance between daily and work, problem solving, professional learning, and goal setting), 4) Outcomes, such as: well-being, commitment, job satisfaction, enthusiasm, and responsibility [4].

Therefore, to increase the professional resilience of teachers, the implementation of teacher education must be able to adapt through intercultural interactions and several aspects of learning, including the acquisition of theoretical and theoretical knowledge according to background and experience as well as technological developments in learning [5].The existence of information and communication technology currently has implications for the abundance of data/information that can be obtained or can be distributed. With the flood of data/information, students need to have digital literacy skills, namely the ability of a person to search, select, and evaluate the information obtained through digital devices (internet). Digital literacy is needed so that students can benefit from the abundance of digital data/information and avoid problems due to the dissemination of incorrect/inaccurate/outdated digital data/information [6–8].

The very rapid development of technology and changes in social, cultural, and work world forces universities to be able to prepare student competencies to be able to adapt to the needs of the times. One of the policies to answer these demands is the birth of the Merdeka Learning Campus Merdeka (MBKM) program in accordance with the Minister of Education and Culture Regulation. Number 30 of 2020. The MBKM program is a form of learning in higher education that is autonomous and flexible so as to create

a learning culture that is innovative, unfettered, and in accordance with student needs. One form of learning activity that is in accordance with MBKM policies is the Teaching Assistance program. One of the objectives of the Teaching Assistance program is to provide opportunities for students who have an interest in education to participate in teaching and deepening their knowledge by becoming teachers in educational units [9].

The Teaching Assistance Program implemented by the Physics Education Study Program at the University of Muhammadiyah Makassar is carried out by recognizing as many as six Subjects (MK) to be converted into the equivalent of a minimum of 20 credits. The Covid-19 pandemic, which has not ended, has forced the form of the Teaching Assistance program to be carried out using Blended Learning by utilizing a number of digital tools. Likewise, in student lecture activities and completing student project assignments using a number of digital tools. This situation illustrates that one form of learning activity that is deemed urgent to be implemented in a teaching assistance program is a digital literacy-oriented debriefing program in the development of student learning tools for teacher candidates.

This article discusses the design of the physics teacher candidate debriefing program through lecture activities in integrated courses in the appropriate Teaching Assistance program. In particular, this debriefing program was developed for prospective Physics teachers to be able to design digital literacy-based learning assessments. They were assigned to discuss various assessments of physics learning and its application in the form of power points and video presentations that were displayed. The purpose of this briefing is to increase student creativity and lead to an increase in professional competence [10]. Many debriefing programs have been developed through lectures, but these programs tend to just provide material without being accompanied by practice. This happens because one subject is more specific in a particular study. However, if there are certain subjects related to the development of learning, the programs provided in these courses need to refer to the development of digital literacy-oriented learning. The orientation of the purpose of this research is to identify what kind of debriefing program can be applied to prospective physics teacher students in preparing them to be able to develop learning tools oriented towards digital literacy. The learning tools in question are limited to the Learning Implementation Plan.

2. RESEARCH method

This research is a research based on research and development. The sample of this research is student physics teacher candidates who are also participants in the teaching assistance program. The number of participants in this debriefing program is 18 students. This research instrument in the form of a questionnaire sheet, and an observation sheet. The analysis technique of this research uses descriptive quantitative analysis. Furthermore, the design of this debriefing program was adopted from the debriefing model developed by Hamdu & W. Sopandi [11, 12]. The development of this debriefing model is based on the stages of development of the Reeves Design Research Based (DBR) debriefing program [13]. The stages of debriefing development consist of: analyzing field needs, designing program development, testing the program, and reflecting the development program, as depicted in Figure 1.

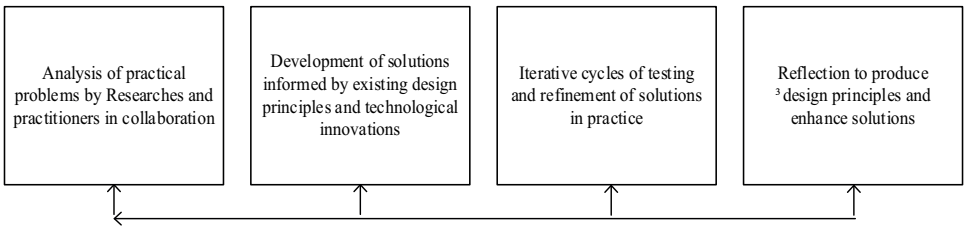

Figure 1: Diagram of Reeves' design based research model.

The design stages of this learning device debriefing program consist of several stages, namely the face-to-face briefing stage, the implementation debriefing stage in the field, and the reflection debriefing stage.

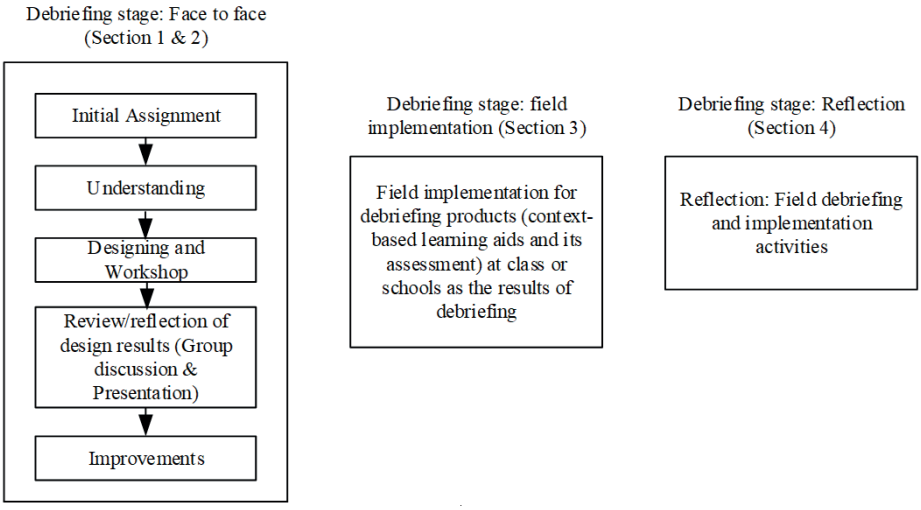

Figure 2: Implementation stage of debriefing program of learning materials.

The initial stage of the debriefing program begins with the delivery of material with the theme “design of devices by utilizing digital literacy” and “design of learning assessment instruments”. The initial stage was carried out face-to-face and accompanied by discussions between resource persons and prospective physics teacher students as participants in the debriefing. Furthermore, the participants were directed to compile a draft learning assessment instrument with assistance from resource persons and a team of instructors. The process of preparing the physics learning assessment instrument includes the curriculum review stage (syllabus), lesson plan analysis, learning objectives analysis, analysis of appropriate forms and types of assessments, and stages of developing appropriate assessment instruments. Furthermore, all participants take turns presenting the results of the assessment instrument developed accompanied by reflections by the resource persons.

3. result and discussion

This debriefing model is carried out without conducting tests both at the beginning and at the end of the program with the assumption that since the beginning of the study the results of previous research have become the basis for developing the debriefing program. The activity of the debriefing program for the development of physics learning assessment instruments begins with the delivery of a number of materials to prospective physics teacher students. The materials presented included the theory of process evaluation and learning outcomes of physics and non-test instruments; stages of developing learning assessment instruments; variety of test and non-test instruments; design of test and non-test instruments. The final stage is the activity of presenting the assessment instrument product which is developed based on the learning competencies that have been prepared.

Based on the data from the results of the physics learning assessment instrument product compiled by the students after carrying out this debriefing, it can be analyzed regarding student understanding in developing physics learning assessment instruments, including: a) Shows clarity in the choice of words or sentences in a good and systematic manner (in general). Overall, the learning assessment instrument developed by the students who attended the debriefing used appropriate operational verbs with a language structure that was easy to understand for students. The arrangement of words and sentences used is written systematically so that it is quite clear what the meaning of the statements in the learning assessment instrument. b) Shows the stages of students in obtaining concepts. The assessment instrument developed helps

students in solving problems and inquiry, according to students' problems in everyday life, showing various dimensions of knowledge, and cognitive levels based on indicators and learning objectives. Furthermore, the assessment instrument that has been prepared shows the existence of interdisciplinary science and systematic in the assessment instrument. In addition, the stages in completing the task help students in obtaining the right concept. The assessment instrument developed also contains a stimulus in the form of text, images that are presented so that it can function to assist students in answering the contents of the learning assessment instrument. The assessment instrument developed is able to train students in drawing conclusions. c) Demonstrate context-based characteristics in the development of authentic tasks through assessment. The development of tasks in the assessment instrument shows the relevance of conditions in the real world by providing appropriate examples, but in the learning activities contained in the assessment instrument it does not show investigation through experimental activities by expanding the concepts associated with the real world. This of course has an impact on the lack of clarity in concept tracing that can link context and content. Furthermore, the participants paid enough attention to the content of teaching materials contained in the curriculum and implementation plans of authentic learning.

Shows the authenticity of the assessment described in the assessment instrument. In the development of assessment instruments by students, there are a number of tasks that allow and are open to alternative answers (various) but do not cover complex tasks that must be investigated and done by students in a certain period according to the level of complexity of the task given. In addition, giving assignments in the assessment instrument can provide opportunities for students to be able to collaborate, it's just that they are not directed at producing a work in accordance with the development of the material. Furthermore, student assignment activities in the developed assessment instrument provide opportunities for students to carry out a number of activities such as thinking processes, performance, and scientific attitudes.

4. CONCLUSION

The program for providing assessment instruments in physics learning is very much needed by students as prospective physics teachers because they can provide an understanding of a concept of developing learning tools, especially in developing assessment instruments. In addition, based on data from the results of filling out questionnaires filled out by students after the debriefing, there is information in the form of

students' interest in participating in debriefing activities again in order to support their professionalism as teacher candidates in the form of training.

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