DEVELOPMENT AND IMPLEMENTATION OF DIGITAL LEARNING BASED ON 5M ACTIVITIES WITH A CULTURAL APPROACH

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Abstract. Today's educational transformation has led to digital-based learning. STKIP Singkawang is one of the universities implementing digital-based learning. The aim of this research is to determine the results of development, implementation, and student learning outcomes in implementing 5M activity-based digital learning with a cultural approach. The research method uses research and development (R&D) with a 4D development model without dissemination stages, namely the define, design, and develop stages. The research results show that the results of the development and implementation of digital modules for SBM courses can be presented more interactively, where all activities carried out in class are presented in writing in digital modules that contain 5M activities and are carried out synchronously and asynchronously. The majority of students' learning outcomes get very high scores, and student responses to learning are very positive.

Keywords: Digital Learning; 5M Activities, Culture

I. INTRODUCTION

Entering the Era of Industry 4.0 and Society 5.0, every university is encouraged to continue to innovate in an effort to improve the abilities of each university's graduates (Sukendra & Fridayanthi, 2021). Higher education institutions are required to continue to develop their ability to innovate in order to adapt to the demands of the times. Apart from that, the Ministry of Education, Culture, Research, and Technology also consistently supports the growing demand for contemporary capabilities, which must be accompanied by ensuring the quality of learning carried out by universities. The world demands for the education system to better prepare students for 21st century competencies to be able to face more complete challenges now and in the future. The competencies in question are knowledge, skills and other attributes that can help students to achieve their full potential (Muhali, 2019). One of the innovations that can be carried out is creating a digital-based learning system. The term digital learning is more precisely intended as an effort to create a transformation of the learning process in schools or universities into a digital form bridged by Internet technology (Yuliani et al., 2020; Sitopu et al., 2022). This digital-based learning can be combined with blended learning (synchronous and asynchronous) or fully asynchronous. which combines several Learning Object Materials (LOM) in the form of videos, animations, slides, text, and/or infographics.. Learning videos like this

tutorial video are more interactive and more specific than a book or module; video tutorials seek to teach by example, demonstrate and provide information to complete a specific task (Laurens, Mananggel and Sapulette, 2021).

However, learning activities at STKIP Singkawang currently still focus on face-to-face learning activities between lecturers and students in the classroom. Based on the results of a student survey of online learning carried out in 2020 - 2022, more than 75% of students at STKIP Singkawang chose to carry out face-to-face lectures in class, especially for exact and practical courses. Apart from that, students also complained about the monotonous presentation of the material, making it seem boring. In 2021, mathematics education study program students will also have the opportunity to carry out online learning via STKIP Singkawang e-learning and via Zoom. Even though based on the research results of Marhayani, D. A. (2021), students' perceptions of the use of e-learning based on the Zoom meeting application from the convenience aspect, usefulness aspect, acceptance aspect are positive, but students' perceptions of the lecture system are still categorized as not good. Because students think that the material provided in e-learning is less interesting and too monotonous. So students often ask the lecturer in the class group again about learning instructions for a course. Other research includes the results of research by Yunus, M., Setiawan, D. F., & Wuryandini, E. (2021), Lubis, N. F., Siregar, E. J., & Batubara, S. I. (2021), Rahmi, A. (2021), and Caisaria, R., & Rosyid, A. (2023) also stated that online learning without presentation that is less interesting and monotonous is not effectively used in learning. Therefore, as an effort to encourage universities to be more active in utilizing digital technology in developing digital materials to support the learning process, the Directorate of Learning and Student Affairs, Directorate General of Higher Education, Research and Technology is organizing an Assistance Program for the Development and Implementation of Digital Learning (P3D) in 2023 .Through this program it is hoped that it can increase and expand the reach of quality learning resources for students (SPADA, 2023).

The Digital Learning that will be developed by the Mathematics Education Study Program is 5M Activity-Based Digital Learning with a Cultural Approach. One learning model that can hone Digital Literacy skills is the 5M Activity Learning Model which consists of 5 stages, namely: 1) selecting and searching for information; 2) processing information; 3) analyze information; 4) use information; and 5) share information (Mursidi, A., Buyung, B., & Murdani, E., 2022). This model refers to the challenges of the Industry 4.0 and Society 5.0 era which requires people to have Digital Literacy skills, as well as students. Learning with 5M activities will be integrated with a cultural approach. The cultural approach intended is a learning approach that utilizes cultural diversity in Singkawang City as the most tolerant city in Indonesia, which consists of multiethnic groups with various cultural forms and characteristics of each tribe in Singkawang City. Kristin (2015) states "learning with a cultural approach is a strategy for creating a learning environment and designing learning experiences that integrate culture as part of the learning process. Alhaddad (2020) also stated that "learning with a cultural approach is very beneficial for students' understanding of the process of gaining contextual learning experiences to understand the concept of knowledge in their local (ethnic) culture."Thus, the aim of this research is to describe the results of the development of the 5M Activity-Based Digital Module with a Cultural Approach and to describe student perceptions about learning using the 5M Activity-Based Digital Module with a Cultural Approach.

II. METHODS

The research method used refers to the Research and Development (R&D) method with the 4D development model by S. Thiagarajan, Dorothy S. Semmel, and Melvyn I. Semmel (Nafisah & Indriani, 2024). However, in this research the stages carried out were Planning, Development and Implementation in Learning. This stage is a simplified form of R&D adapted to the situation in this research. The research subjects were 15 students from the mathematics education study program and 33 students from the PGSD study program. The instrument used in the research is an instrument for assessing student learning outcomes in the form of project assignments, which are assessed based on the project assessment rubric. The rubric is arranged based on rules on a Likert scale. Another instrument is a student perception questionnaire about learning using the 5M Activity-Based Digital Module with a Cultural Approach, which contains statements about the response, ease, and clarity of the language used in the digital module. Observations of learning outcomes were carried out in 13 meetings, and at each meeting, the progress of the project results made by the students was observed. Meanwhile, student perceptions were carried out twice, namely at the 8th meeting and at the 15th meeting.

III. RESULTS AND DISCUSSION

Based on the results of research during one semester, and based on the results of data analysis, the research results will be described as follows:
Planning Results

At this stage, a review of the courses and program plans is carried out. The things that are reviewed are whether the CPL, sub-CPL, and course materials are in accordance with the program objectives. Apart from that, researchers also examine the teaching materials and learning processes used in teaching the courses that will be used. The proposed course is the Mathematics Teaching and Learning Strategy (SBM) course in semester 3. Next, the researcher compiles the SBM RPS, which is structured based on the 5M learning stages

(selecting and searching for information, processing information, analyzing information, using information, and sharing information) and culture-based. The content or content of the selected courses is based on mutual agreement, including the development of the material and also the assignment and assessment system that will be carried out. Each team member prepares formulations for two sub-materials/subject meetings and writes the results into a Google sheet. Several days later, another coordination meeting was held to finalize the formulation of the RPS for the SBM course, which uses the 5M and culture-based learning models. The RPS prepared is adapted to the needs of online learning, both synchronously and asynchronously, which include assessment methods, collecting assignments/projects, and interaction with students.

In planning, the content and applications that will be presented in the learning video are also determined. Some of the applications agreed upon at the beginning of the discussion were CANVA, D-ID, and H5P. The learning video was made by seven team members who received two materials whose content and presentation were the responsibility of each team member. The content created is assessed for suitability by the STKIP Singkawang IT team until it is deemed suitable for uploading on the STKIP Singkawang YouTube channel. The final result of this planning stage is that the draft content material that has been created by the team members is also reviewed by the Content Team, which is then revised according to the suggestions given. The mapping of application usage for packaging learning video content is Canva, Record Video, Camtasia, H5P, Background Eraser, Plotagon, D-Id, Gslide, Google Picture, Google, Youtube, and Powtoon.

Development Stage

At this stage, the learning videos that have been made, along with learning tools in the form of teaching materials, and instruments for assessing learning outcomes, are reviewed together with colleagues, and the content is re-examined according to the results of the review. After the learning video is declared suitable for learning, the video is sent to YouTube by STKIP Singkawang.

All learning devices must contain learning object material (LOM), including interactive learning videos, animations, slides, text, and infographics. The video in question is an interactive learning video that contains animations and slides. Meanwhile, what is meant by text is a lecture module consisting of 16 meetings. And what is meant by infographics is material posters and process illustrations.

The 14 learning videos that have been developed based on 5M activities have been uploaded to STKIP Singkawang's YouTube, so they are easy to access and embedded on the SPADA learning platform. The 14 learning videos are interactive learning videos that are arranged based on three learning activities, namely opening learning activities, core activities, and closing

learning activities. In the opening learning activity, students will be given a stimulus in the form of trigger questions embedded in the learning video using the H5P application, which must be answered first by students so they can watch the learning video further. In the opening learning activity, the activity carried out is the activity of selecting and searching for information. Students will be given excerpts related to the material that will be discussed, along with directions for lecture activities that students must carry out as project assignments. The final forms of project assignments in question are teaching modules, presentation materials, papers, video presentations, learning videos, and case study analysis.

Furthermore, in the core learning activities, students will be assigned to analyze a problem presented in the form of a video on YouTube, learning tools, or teaching materials related to the material discussed through the activities of processing information, analyzing information, and using information. Apart from being presented in interactive learning videos, students can also do activities to process and analyze information outside of lectures. Students are given a maximum of six days to complete the given project. The final activity is the closing activity. In the learning video, the activities to close the lesson are presented in the form of an assignment collection link, which is embedded using H5P. Students are asked to share the information they have obtained, which will then be reviewed jointly by the course lecturer and members of other groups. The results of the review serve as input and improvement material for project assignments for each group. Corrected assignments must be re-uploaded according to the type of project assignment given.

The final stage of the results of this development is uploading lecture material to the LMS at SPADA Indonesia. The results of the digital module footage in SPADA will be described as follows.

Figure 1. Initial Appearance of The Digital Module on Spada

At the beginning of the alert display, the digital module is informed about the identity of the course and the identity of the lecturer who teaches the course.

Figure 2. Example of Additional Information on A Digital Module.

Apart from the identity of the teaching lecturer, at the beginning the identity of the course teaching team is also presented, a description of the course material and Graduate Learning Outcomes (CPL) for the course, which is equipped with a Semester Lecture Plan (RPS) and project assignment assessment rubric. An example can be seen in figure 2.

Figure 4. Example of Lecturer Interaction on Digital Modules

Based on Figure 4, In the digital module, written communication is mandatory as a form of interaction between lecturers and students. All forms of lecturer interaction during face-to-face lectures in class must be presented in written form in digital modules. So even though lectures are held online, interaction between lecturers and students still takes place.

Figure 5. Example of Learning Video Information

Based on Figure 5, in the digilat module, it is mandatory to convey information related to the learning video, assignments, devices, identity, and duration of the video that will be watched by students.
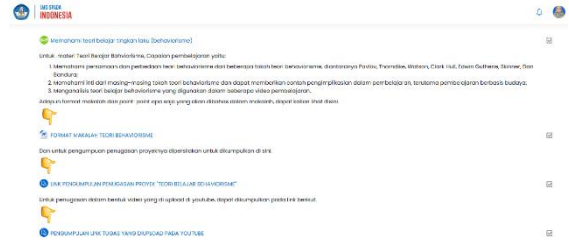

Figure 6. Examples Of Learning Material Access Information, Assignment Links and Assignment Information

Based on Figure 6, digital modules must also be equipped with assignment information and instructions, even though these instructions have been presented in full in the learning video. This information can be arranged so that students cannot access other information or instructions if the previous instructions are not opened. Overall, the digital module of this SBM course is presented more interactively, where all activities carried out in class are presented in writing in a digital module that contains 5M activities and is carried out synchronously and asynchronously.

Implementation of Learning in LMS STKIP Singkawang and *SPADA*
1. Pre-Implementation of Lectures
    At this stage, before lectures begin, students are first provided with the materials students need to complete all project assignments at each meeting. The material includes practice and use of Canva, D-ID, Powtoon, SPADA Indonesia and Moodle STKIP Singkawang. The final stage at this point is to test the use of the learning platform on *SPADA* Indonesia.
2. Implementation of Lectures
    For the lecture process, the process is divided into 2 stages based on the 5M learning stages, namely the asynchronous and synchronous stages. In the asynchronous stage, students carry out activities selecting and searching for information, processing information, analyzing information based on teaching materials that students access at *SPADA* Indonesia. Meanwhile, the Using Information and Sharing Information stages are carried out synchronously, namely carrying out a discussion process regarding the results that students have completed in groups. The discussion process is carried out in class or via zoom meeting. Examples of learning implementation using digital modules can be seen in Figure 7 and Figure 8 below.

Figure 7. Example of student identity form

Figure 7 is an example of student input related to student identity. The aim is to form groups in the SBM course. Students fill in this information via the Google form which is distributed at the first meeting.
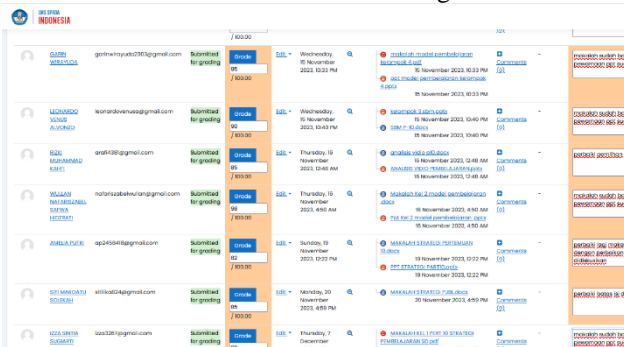

Figure 8. Example of collecting student project assignments

3. Learning outcomes and student perceptions

Based on the results of the assessment at the 8th meeting and the 15th meeting, the results obtained were that 83% of students got scores in the range of 81 - 100. Meanwhile, the other 17% got scores in the range of 70 - 80. Although the scores obtained by the students were in the very good category, However, the level of student assignment plagiarism at the 2nd to 4th meetings was very high. However, the percentage of student plagiarism from the 5th to the 15th meeting gradually began to decrease. Although the plagiarism rate is still around 30%. Students' perceptions of learning using digital modules for SMB courses received positive responses. The level of independence and responsibility of students increases with each meeting, although at some meetings students start to get bored. This boredom occurred at the 7th meeting and 15th meeting. This was because the 7th meeting and 15th meeting were the last meetings before the final exam and there was a holiday before the final exam. Students consider that projects that are awarded are given a longer period of time. So at the 7th and 15th meetings there was a delay in collecting assignments from students. But overall 85% of students responded positively to learning using the SBM digital module based on 5M Activities with a Cultural Approach.

Conclusion

The conclusions from the research results are as follows:

1. The results of the development and implementation of digital modules for SBM courses can be presented more interactively, where all activities carried out in class are presented in writing in digital modules which contain 5M activities and are carried out synchronously and asynchronously.

2. Student learning outcomes using digital modules based on 5M Activities with a Cultural Approach are in the high category with a score range of 81 – 100.

3. Students' perception of learning using digital modules based on 5M Activities with a Cultural Approach received a positive response.

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