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The Effectiveness of Multimedia Interactive Jobsheet Use in Woodworking Workshop Class

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ABSTRACT: This study aims to determine the effectiveness of using the Multimedia Interactive Jobsheet (MIJOBS) learning media in the Woodworking Workshop class. Descriptive quantitative research with the experimental method was conductedto compare the effectiveness of using old jobsheets (control class) with the effectiveness of using MIJOBS (experimental class).A questionnaire was used as an instrument to collect the data. The results showed that the useof MIJOBS had reached 89.1% in terms of understanding speed, the creativity aspect reached 87.5%, and the aspect of learning outcomes reached 87.5%. Overall, the effectiveness of using old jobsheets was 60.32% and the effectiveness of MIJOBS was 88.03%. It means MIJOBS was more effectivethan old jobsheets. Regarding to the results, it can be concluded that the use of MIJOBS as a learning medium in the WoodworkingWorkshop Class has been effective in terms of improving understanding, learning motivation, and learning outcomes.

Keywords: *Effectiveness, Multimedia Interactive Jobsheet, Media.*

I. INTRODUCTION

The rapid development of technology in the era of the industrial revolution 4.0 greatly affects the characteristics of the job, where skills and competencies are the main things that must be considered, so as to be able to produce highly competitive human resources. The Industrial Revolution 4.0 not only has the potential to overhaul industrial aspects, it is also able to change various aspects of human life, one of which is the world of education. The world of education is required to be able to develop learning innovations by integrating learning, technology and information.

Padang State University has provided full support in the form of technology and information-based facilities in every learning process. One of them is by implementing E-learning (Electronic Learning), which is distance learning that utilizes computer technology, computer networks and or the Internet. Unfortunately, this facility is rarely used in practicum courses such as the Timber Work Practice at the Civil Engineering Department, Faculty of Engineering, UNP.

Timber Job Training is a course designated for students of the Building Engineering Education Study Program. Based on the observations of researchers on this subject, there has been no use of e-learning in the learning process. The learning devices and media used are still traditional. The jobsheets used in the lecture were in the form of print jobsheets designed in 1999/2000. In the jobsheet, material on Introduction and Operation of Wood Machines is given. machines that were introduced were only old machines, while there were several newer and more modern machines that were owned, but were not introduced in the job sheet. Therefore it is necessary to introduce the latest wood machinery. In addition, weaknesses were also found, such as only

simple pictures with unclear details, this is because the image is black and white and not detailed. The lack of information provided aims to prevent students from getting bored reading job sheets because of too much reading, causing complications such as lack of understanding of students in practice implementation. Devices and media that are not updated can certainly hinder the development of learning. Given that jobsheets have an important role in the practical learning process, the available jobsheets should begin to be adjusted to the basic competencies in the

current curriculum.

In terms of technology, there are four types of learning media that support the learning process, namely, print media, audio media, audio visual media, and interactive multimedia. Jobsheet media is a type of print media, unable to display motion and sound. Meanwhile, the ability to increase perception, understanding, transfer messages, provide reinforcement or knowledge of the results achieved, and the ability to increase retention (memory) are obtained from media that display motion and sound. For this reason, the jobsheet should be accompanied by an interactive video tutorial that combines three types of media, audio, visual, and interactive multimedia. It is hoped that with the help of the interactive video tutorials, students can quickly understand the material.

Given that lecturers cannot repeatedly explain and demonstrate the meeting material that day due to limited lecture time, UNP provides a solution to the limited lecture time with e-learning facilities. By using e- learning facilities, lecturers can provide information about the material to be studied before the practical day is carried out, so that students know the material and practices that will be carried out. Previously, e-learning facilities could only be enjoyed by theoretical courses only, researchers intended that these facilities could also be enjoyed by practicum courses, one way is to design jobsheets in electronic form that had never previously existed in practicum courses.

Based on the above problems, a jobsheet has been developed that is tailored to the needs of current lectures. Given that vocational education is closely related to technological advances, as well as e-learning facilities provided by UNP, the researchers plan to test the effectiveness of the MIJOBS (Multimedia Interactive Jobsheet) learning media in the wood work practice course. MIJobs contains revised jobsheets, accompanied by materials and videos at each step of the work, and can be controlled by readers.

This study aims to test the effectiveness of MIJOBS from the aspects of speed of understanding, creativity, and student learning outcomes so that it can be used as an introduction to student learning before entering lectures.

II. THEORITICAL REVIEW

E-learning is an information system that can integrate various kinds of learning materials (via audio, video, and text media) which can be delivered via email, live chat sessions, online discussions, forums, quizzes, and assignments [1]. The concept of e-learning refers to a combination of technology and the learning process [2]. According to the UNP e-learning Guide Module, Electronic Learning (e-learning) is distance learning that utilizes computer technology, computer networks and or the Internet. E-learning refers to the use of internet technology to deliver a series of solutions that can increase knowledge and skills [3]. Internet network has opened opportunities for various learning models in learning at school, on campus, training and research activities [4]. The existence of electronic devices as media development tools is greatly helped by an internet connection [5]. Based on the opinion of these experts, it is concluded that e-learning is a direct result of the integration of technology and education which is able to transcend geographical boundaries but can connect lecturers and students in the learning process with the help of internet networks. Distance learning is carried out by providing materials and assignments only will seem very monotonous and difficult to understand. Therefore it is necessary to have a learning media that is adapted to this distance learning facility.

The word media is the plural form of the word medium. In line with this understanding. In Arabic, the media is an intermediary or messenger from the sender to the recipient of the message. Media can also be interpreted as one of the components of communication, namely as a messenger from the communicator to the communicant [6]. According to the National Education Association, the media is a form of communication, both printed and audio-visual and its equipment; thus, the media can be manipulated, seen, heard, or read [7]. According to the Big Indonesian Dictionary (KBBI) on the website https://kbbi.web.id/ajar (accessed December 29 2018) the word learning comes from the word teach. Teach, which means instructions given to others so that
they are known, learning is the process, method, act of making people or living things learn. The teaching and learning process is essentially a communication process, conveying messages from the introduction to the recipient. Learning is a combination composed of human elements, materials, facilities, equipment, and procedures that influence each other to achieve learning objectives [8]. Learning media is anything both physical or technical in the learning process that can help teachers to simplify and convey learning material to students so as to facilitate the achievement of learning objectives that have been formulated [9]. Learning media has an important role in supporting the quality of the teaching and learning process [10]. From some of the opinions above, it can be

concluded that learning media is a teaching and learning tool that can be seen, heard, or read, aiming to stimulate thoughts, feelings, attention and abilities or skills so as to encourage the teaching and learning process. Good learning media consists of a combination, audio, visual and can be controlled. We can find the combination of the three types of media in interactive multimedia learning media.

Interactive multimedia is a medium that can interact with users, where users can choose what to do next, ask questions and get answers through user and media interaction [11]. That is, it requires an active role from the user to run interactive learning multimedia. The multimedia component is a combination of several components of the human senses [12]. This means that collaboration components ranging from visualization, audio, and student motor skills can be channeled with the content of learning materials. Innovative learning media such as interactive multimedia are effective and feasible to be applied in the learning process [13]. Based on the quotation above, it can be concluded that interactive learning multimedia is a variation or combination of various media in the form of text, graphics, audio, and interactions used in conveying messages and information from sender to recipient of messages / information in learning materials. Interactive learning multimedia is equipped with an instruction page that can be operated by students, where students can choose what to do next, so that students can focus on the material or the practical work steps of Woodworking which are considered difficult.

Jobsheet is an instruction page for a worker to perform tasks [14]. Jobsheets are teaching materials written freelance for practical learning in workshops, containing one practical activity, which is risky, therefore in the jobsheet it is necessary to add K3 instructions (occupational safety and health). The steps for practicum activities must be written clearly so that they do not cause misconceptions which will result in mistakes in choosing, using, arranging tools / materials and will have fatal consequences to material / equipment damage or even work accidents. The jobsheet at least consists of (1) the title of what basic competencies will be achieved,
(2) completion time, (3) equipment or materials needed to complete a brief information task, (4) work steps, (5) tasks that must be done and (6) reports that must be done [15]. This means that the jobsheet only contains brief information, work steps, and others in the form of printed media, unable to see directly the process and work steps in one material. For this reason, it is necessary to make a learning media containing jobsheets using interactive multimedia concepts. Researchers call it MIJobs (Multimedia Interactive Jobsheet).

MIJobs combines jobsheets with interactive multimedia. MIJobs is a learning media that contains lecture material and work steps accompanied by pictures and videos, which can be controlled by the user. This aims to make students understand by seeing the video directly of each work step. In designing the researchers used the Kvisoft FlipBook Maker program. The Kvisoft Flipbook Maker program is an application that supports learning media that will help in the learning process because this application is not only fixated on writing, but can include motion animation, video, and audio that can make an interactive interesting learning media. so that learning is not monotonous [16]. The Kvisoft FlipBook Maker application is used when designing to combine materials, work steps, images, and videos at each stage to produce MIJobs Learning Media.

III. METHODS

This research was conducted by using quantitative descriptive study. By doing experimental methods,the researchers wanted to compare the effectiveness of using old jobsheets with the effectiveness of using the Multimedia Interactive Jobsheet (MIJOBS). It was carried out by comparing two classes; control class and experimental class. The control class which involved 16 students was the class that used the old Jobsheet. Meanwhile, the experimental class which has 16 students was a class that used MIJOBS. The research was conducted to the students of the Civil Engineering Department, Faculty of Engineering, State University of Padang, who took Woodworking Workshop Class for thesemester of July-December 2020. The study was started by giving a pre-test to both classes to ensure that theabilities of the two classes were not significantly different. Then, the research was continued by providing different treatments for each class for one semester or sixteen meetings. At the end of the class, each student was given an instrument in the form of a questionnaire. There were some indicators in that questionnaire; they werespeed of understanding, creativity, and learning outcomes. If the data analysis showed that the experimental class was significantly higher than the control class, then the MIJOBS media was more effective than the old jobsheet media.

IV. DATA ANALYSIS AND RESULTS

Before conducting the research, a pre-test was carried out to both classes at the beginning of the semester. It was obtained that the pre-test results did not have a significant difference between the two classes. The data of speed of understanding and creativity aspects were obtained from distributing questionnaires to students in the control class and the experimental class. Data on the aspects of learning outcomes were obtained by providing questions related to the Wood Working Practice course material, and then it changed into percentages. The pre-test results can be seen in table 1 below.

Table 1. Pre-Test Results

Control	**Aspects**	***Experiments***
37,5 %	Understanding speed	31,2 %
42,2 %	Creativity	39,1 %
15 %	Learning outcomes	11,25 %
40,1%	average	36,97 %

Based on the data from instrument which was shared to the students from control class and experimental class, the result can be seen in the table 1.

Table 2. Results Of Data Analysis

Control	**Aspects**	***Experiment***
59,4 %	Understanding speed	89,1 %
57,8 %	Creativity	87,5 %
63,75%	Learning outcomes	87,5 %
60,32 %	average	88,03 %

In terms of understandingspeed, the percentage for the control class was 59.4% and the experimental class was 89.1%. When it was compared with the pre-test results, both classes experienced an increase. The control class was from 37.5%, after having class for one semester it increased to 56.4%. The experimental class increased from 31.2% to 89.1%. Based on these data, it was found that the experimental class experienced a significant increase in value compared to the control class. It reveals that in terms of speed of understanding, MIJOBS was more effective than old jobsheets and it can be included to the very good category.

In creativity aspect, the result of the control class pre-test was 42.2% and the experimental class was 39.1%. Even though it was not significant, it shows that at the first, the control class was superior to the experimental class. After getting different treatments for one semester, the creativity aspect increased. The control class obtained a percentage increase in value of 57.8%, and the experimental class had 87.5%. The experimental class experienced a significant increase compared to the control class. It means that from the aspect of creativity MIJOBS students were more effective than old jobsheets and it was included to the very good category.

For the learning outcomes aspect, during the pre-test, both classes were given questions related to the Woodworking Practice course for one semester. Generally, the average of students' learning outcome for the control class was 15% and the experimental class was 11.25%. There was an increase after conducting the post-test, it was obtained that the average learning result of the control class was 63.75% and the experimental class was 87.5%. Thepre-test and post-test on the aspects of learning outcomes were described in table 3 and table 4 below.

Table 3. Percentage Of Woodworking Practice Course Pre-Test

Control	**Material**	***Experiment***
31 %	Introductions of handwork tools	25 %
0%	Introductions of machine tools	0 %
19%	Wooden joints	13 %
13 %	Door & window jamb making skills	6 %
13 %	Doors and windows making skills	13%
15%	Average	11,25%

The pre-test result from the two classes about the materialsfor one semester shows that both classes have not understood the material. In the handwork tools introduction material, the level of understanding from the control class was 31% and the experimental class was 25%. The level of understanding about the introduction of machine tools for the control class was 0% and the experimental class was 0%. The level of understanding of the wooden joints in the control class was 19% and the experimental class was 13%. The level of understanding of door& window jamb making skillsin the control class was 13% and the experimental class was 6%. The level of understanding of doors & windowsmaking skill for the control class was 13% and the experimental class was 13%. Overall, before the learning was implemented, the control class learning outcomes were superior;it can be proved from the results of an average percentage of the control class was 15%, and the experimental class was 11.25%.

Tabel 4. Percentage Of Woodworking Practice Course Post-Test

Control	Materials	Experiment
69%	Introductions of handwork tools	94%
63%	Introductions of machine tools	94%
56%	Wooden joints	88%
63%	Door & window jamb making skills	81%
69%	Doors and windows making skills	81%
63,75%	Average	87,5%

After the experimental class was treated, the other test was conducted related to the material that has been discussed. In the handwork tool introduction material, the level of understanding of the control class was 69% and the experimental class was 94%. The level of understanding of the material on the introduction of machine tools in the control class was 63% and the experimental class was 94%. The level of understanding of wooden joints in the control class was 56% and the experimental class was 88%. The level of understanding of the material for door and window jamb making skills in the control class was 63% and the experimental class was 81%. The level of understanding of doors & windows making skills material in the control class was 69% and the experimental class was 81%.

Table5. Percentage Of Woodworking Practice Course Post-Test

No	Control Class			Experimental Class		
	Interval	Frequency	%	Interval	Frequency	%
1	81-100	0	0,0%	81-100	10	62,5%
2	61-80	6	37,5%	61-80	6	37,5%
3	41-60	7	43,8%	41-60	0	0,0%
4	21-40	3	18,8%	21-40	0	0,0%
5	0-20	0	0,0%	0-20	0	0,0%

In the control class, there were 37.5% or six students who got score around 61-80, there were 43.8% or seven students with score of 41-60, and it was 18.8% or three students with a score range of 21-40. In the experimental class, there were 62% or 10 students got 81-100, and 37.5% of them or six students got 61-80. The highest score in the control class was 100 for one student, the lowest score was 40 for four students, and the average score for the control class was 63.75. The highest score in the experimental class was 100, achieved by eight students, the lowest score was had by two students, and they got 60. The average score for the experimental class was 87.5; it shows that the results were very good.

The two classes that have carried out the Wood Work workshop class for one semester have experienced an improvement in learning outcomes. Based on the aspects of understanding speed, creativity, and learning outcomes, the control class average was 60.32% and the experimental class was 88.03%. These data indicate that the average learning outcomes in the experimental class was superior to the control class. It means the MIJOBS learning media used was more effectively used in practicum compared to the old jobsheets.

V. CONCLUSION

Regarding to the research findings, there are some points which can be concluded. First, the aspects of speed of understanding (89.1%), creativity (87.5%), and learning outcomes (87.5%) in the experimental class were included to the very good category. Second, the use of the Multimedia Interactive Jobsheet learning media in the Woodwork workshop course provided a significant increase (88.03%) comparing to the class which only used old jobsheets (60.32%). Therefore, the MIJOBS learning media has been effectively used in learning Wood Work Practices.

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