:: IJEBD ::
(International Journal of Entrepreneurship and Business Development)
Volume 05 Number 01 January 2022

ISSN : 2597-4785 (ONLINE)
ISSN : 2597-4750 (PRINTED)

Implementation of Research Statistics Booklets Assisted Zoom Applications on Student Learning Outcomes

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ABSTRACT

Purpose: The purpose of this research is to find out the implementation of the zoom application assisted by research statistics booklets on student learning outcomes

Design/methodology/approach: The research method used in this study is an experimental method with a quantitative approach. Data collection techniques are done through observation and tests. Data analysis was performed with the Paired Samples Test using the IBM SPSS Statistics 24 tool.

Findings: It can be seen from the study results that there is an increase in the value of the average score, i.e., 20.8, from the pretest results of 58.0 (enough criteria) to 78.75 (excellent standards) on the post-test results. The hypothesis test results indicate a significant effect of the zoom application assisted by the research statistics booklet in improving student learning outcomes in the research statistics course.

Practical implications: The learning process, especially e-learning, is in dire need of suitable media/tools to support learning, especially practical or computational subjects that require face-to-face explanations even through cyberspace so that learning objectives are achieved, and these media/devices must be supported by internet connectivity with sufficient access.

Originality/value: This research results from researcher analysis based on research results to determine the implementation of the zoom application assisted by research statistics booklets on student learning outcomes in semester 5 of the accounting education study program at the University of PGRI Palembang.

Paper type: Is categorized as a research paper.

Keyword: *Research Statistics Booklet, Study Results, Zoom App*
Received : November 20th
Revised : January 13th
Published : January 31th

I. INTRODUCTION

Education in the industrial revolution 4.0 is described by integrating *cyber* technology, both physical and non-physical, in learning. The present era is going through an educational phenomenon that must be able to respond to the needs of the industrial revolution by adjusting the new curriculum according to the current period, so that the curriculum can open a window of the world through the hand, for example, using the internet in learning that can be accessed via *smartphones*. However, this does not escape the challenges for teachers to implement. This is because a teacher must be able to mix learning and export competencies to students to apply collaboration in the learning process that does not escape technology-based capabilities in the form of online learning interactions (in the network) or *blended learning*.

Changes in the industrial era have made the learning process, which is usually face-to-face in class, change into collaborations of face-to-face interactions in cyberspace, namely through online learning. In addition to the acceleration of this change, the Covid-19 pandemic has changed the learning process to switch at home. Even in the 'new normal' phase or entering the second level, learning is still done at home (*online*) because the number of students exceeds the maximum room capacity to comply with health protocols.

ISSN : 2597-4785 (ONLINE)
ISSN : 2597-4750 (PRINTED)

This transition and change certainly make learning done through online lectures (*e-learning).* Therefore, it requires suitable media/tools to support learning so that learning objectives are achieved. These media/tools use the internet with access and connectivity that must support learning.

Learning media are everything that can be used to channel or deliver messages and introductions to recipients so that they stimulate the thoughts, feelings of attention and interest, and abilities of students in such a way that the learning process occurs in order to achieve learning objectives effectively (Sukiman, 2012).

The use of media in the learning process is one of the essential aspects, but the media is not intended to replace the important role of educators as it is aimed to complement and assist educators in conveying information. Media is an intermediary or deliverer of messages from communicators to communicants in a student environment to stimulate them to learn (Daryanto, 2013) Media is a form of communication, both printed and audiovisual and equipment. Media should be manipulated, can be seen, heard, and read. The types of learning media, according to Rusman (2012) are as follows:

1. Visual media: Visual media can only be seen using the sense of sight consisting of media that can be projected and media that cannot be projected, usually still images or moving images.
2. Audio media: media that contain messages in an auditive form that can stimulate the thoughts, feelings, attention, and willingness of students to study teaching materials.
3. Audiovisual media, namely a combination of audio and visual or commonly called viewing-hearing media.
4. Presenting media group. The media presenters group, as disclosed by Donald T. Tosti and John R. Ball, are grouped into seven types, namely: (a) the first group; graphics, printed materials, and still images, (b) the second group; silent projection media (c) third group: audio media, (d) fourth group: audio media (e) fifth group: live image/film media, (f) sixth group: television media and (g) seventh group: multi-media.
5. Object media and computer-based interactive media. Object media is a three-dimensional medium that conveys information not in the form of presentation but through its own physical characteristics, such as its size, shape, weight, arrangement, color, function, and so on.

Based on the opinion above, it can be concluded that learning media is anything that can be in any form, either visual, audio, audiovisual, as well as presenting media and object media in the form of computer-based interactive media that functions to channel or convey messages and introductions to recipients so as to stimulate thoughts, feelings of attention and interest as well as the ability of students in such a way that the learning process occurs in order to achieve learning objectives effectively and efficiently. There are many examples of learning media, including *zoom meeting* applications and *booklets.*

Zoom Meeting is an application that provides remote conferencing services by combining video conferencing, *online* meetings, chat to mobile collaboration. This app belongs to the company *Zoom Video Communications,* based in San Jose, California. For long-distance communication media, this application is widely used. This is because the *zoom* application, when used, has advantages, namely: 1) the basic version of this *cloud*-based meeting software is free, 2) users have a number of different tools to choose from during the learning process, and 3) facilitates information and communication remotely (Anggi Dwi Pratiwi, 2019).

Another advantage of using *Zoom Meetings is that it is* more practical and efficient for students because when using *Zoom Meetings,* communication between students and lecturers is easier than communicating in writing or via *chat* (Haqien, D., & Rahman, 2020). For the convenience of information and communication remotely that this application has, it will be able to help the learning process, especially in subjects that have a lot of practice or case questions such as research statistics.

On the other hand, the phenomenon that occurs during the teaching and learning process of research statistics where when following this course students have difficulty in obtaining or having learning resources in the form of books, this is due to the economic limitations of some students who do not or lack the funds to buy books, so the alternative is what they can do is borrow books from the library, but due to time constraints and face-to-face learning collaboration in class and cyberspace, this causes this to be less than optimal, besides that most of the books use relatively high language for students, so they are less interesting to read.

This situation will certainly make the learning objectives not fully achieved, considering that the research statistics course is a practical or computational course that requires sufficient time to learn, and inevitably they have to study independently. Therefore, through this research, the solution given is to provide learning resources in the form of learning media, namely *booklets,* and will be clarified during the learning process through the *Zoom Meeting* application.

A booklet is a small (half quarto) and thin book that contains writing and pictures. The term *booklet* comes from books and *leaflets,* meaning that the *booklet* media is a combination of *leaflets* and books with a small format (size) such as *leaflets.* The structure of the contents of a *booklet* resembles a book (introduction, content, closing); it's just that the way the content is presented is much shorter than that of a book (Simamora, 2009). According to Darmoko quoted from Pralisaputri, KR, Soegiyanto, H., & Muryani (2006), a *booklet* is a small book that has at least five pages but no more than forty-eight pages outside the cover count.

ISSN : 2597-4785 (ONLINE)
ISSN : 2597-4750 (PRINTED)

The use of *booklets* will be very popular with students due to their different appearance and special design but still in the form of a book. Making the contents of a *booklet is* no different from making other media; the thing that needs to be considered in making a *booklet* is how the compiler organizes the material as attractively as possible so that when someone glances into the *booklet*, there will be interest in reading further. The important side that must be highlighted in *booklet* prints is usually on the display side first. According to Ewles, who is followed in Roza (2012) *booklets* have the following advantages:

1. It can be used as a medium or self-study tool.
2. You can learn the contents easily.
3. Specific information can be presented.
4. Easy to create, reproduce, repair, and customize.
5. Reduces the need for note-taking.
6. It can be made simply and is relatively inexpensive.
7. Durable.
8. Can be directed to a specific segment.

In addition, with the *booklet* learning media, students can learn on their own (study independently) wherever and whenever. Teaching materials or learning materials *(instructional materials)* generally consist of knowledge, skills, and attitudes that students must learn in order to achieve predetermined competency standards (Depdiknas in Rahmawati (2013) Furthermore, according to the results of research, (Sulaiman, M., Ngabekti, S., & Midiatningrum, 2019) stated that the use of *booklets is* effective for improving student learning outcomes.

Based on the above understanding, it can be concluded that a *booklet* is a small (half quarto) and thin book, which contains writing and pictures, with a structure resembling a book containing an introduction, content, and closing that presents information in an interesting and specific and useful way to facilitate in the learning process so as to improve learning outcomes.

Learning outcomes are certain competencies or abilities, both cognitive, affective, and psychomotor, that are achieved or controlled by students after participating in the teaching and learning process (Kunandar, 2015). This is in accordance with the statement (Kunandar, 2015), which cites Hamalik's conclusion explaining that learning outcomes are patterns of actions, values, understandings, and attitudes and abilities of students. Meanwhile, according to Sudjana, as quoted in Farihatun, SM (2019), learning outcomes are essentially behavioral changes that include cognitive, affective, and psychomotor fields.

Yen Jung-Chuan Lee (2012) states that the knowledge possessed by each student after participating in learning activities can be categorized into three types, namely; declarative knowledge, procedural knowledge, and structural knowledge. Factors that affect the process and learning outcomes (Djmarah, 2011) include:

1. Environmental factors, the environment is part of the lives of students. a) Natural environment (b) Socio-cultural environment.
2. Instrumental factors, (a) Curriculum, (b) Programs, (c) Facilities and facilities, (d) Educators.
3. Physiological conditions, physiological conditions in general, are very influential on a person's learning ability.
4. Psychological conditions, (a) Interest, (b) Intelligence, (c) Talent, (d) Motivation, (e) Cognitive ability.

Based on the opinion above, it can be concluded that learning outcomes are visible changes, a set of knowledge, attitudes, and abilities that a person has after receiving a learning experience over a certain period of time. Learning outcomes are not only expressed in the form of numbers but can be in the form of student behavior or activities expressed in words.

Based on the description of the background above, the researcher wants to conduct research on students of the Accounting Education Study Program who will take research statistics courses with the title **"Implementation of *Zoom* Applications Assisted by Research Statistics *Booklets on* Student Learning Outcomes."**

II. METHODOLOGY

The research method is a scientific way to obtain data with specific purposes and uses (Sugiyono 2019). The research method used in this study is an experimental method with a quantitative approach. The experimental method is a quantitative research method used to determine the effect of the independent variable on the dependent variable under controlled conditions (Sugiyono 2019)

ISSN : 2597-4785 (ONLINE)
ISSN : 2597-4750 (PRINTED)

This research was conducted at the Accounting Education Study Program, FKIP University, PGRI Palembang. This is done because researchers teach in the study program, so researchers want to improve student learning outcomes, especially through applications and learning media. The subjects in this study were all students in semester 5 (five) for the 2021/2022 academic year, totaling 20 students. The variables in this study are the z*oom* application assisted by the research statistics *booklet* as the independent variable and student learning outcomes as the dependent variable. According to Sugiyono (2019) research variables are everything in any form determined by the researcher to be studied so that information about the topic is obtained, then conclusions are drawn.

Data collection techniques used in this study were observation and tests. Observation is used to see student activity when participating in the learning process using the *zoom* application assisted by research statistics *booklets.* The test technique in this study was used to obtain student learning outcomes both before being given treatment (learning using a *zoom* application assisted by research statistics *booklets*) and after being given treatment.

The data analysis technique used in this study is parametric statistics if the data meets the prerequisite test/classical assumption test, while if the data does not meet the prerequisite test, then non-parametric statistics are used. The reason for using this analytical technique is that researchers want to know the effect of the *zoom* application assisted by research statistics *booklets* on student learning outcomes. The analysis was carried out using the SPSS 24.0 (*Statistical Product and Service Solutions*) program.

III. RESULTS AND DISCUSSION

A. Descriptive Analysis

Student learning outcomes before being given learning treatment using the *zoom* application assisted by research statistics *booklets* (*Pre Test*) can be seen in Table 1 below:

Table 1. Frequency Distribution of Student Pre-Test Results Before Using the Zoom Application Assisted by Research Statistics Booklet

Score interval	*Number of Students*	*Percentage*	*Criteria*
85 – 100	*2*	*10%*	*Very satisfy*
76 - 84.99	*1*	*5%*	*Very good*
70-75.99	*3*	*15%*	*Well*
60-69.99	*3*	*15%*	*Pretty good*
56-59.99	*3*	*15%*	*Enough*
46-55.99	*1*	*5%*	*Not enough*
45.99	*7*	*35%*	*Fail*
Amount	*20*	*100%*	
			Enough
Average	*58.0*		

Source: Primary Data Processed, 2021

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ISSN : 2597-4750 (PRINTED)

Based on table 1 above, it can be seen that the average student score is 58.0 in the Enough category. The table of pretest results also shows that students get scores on each criterion, and the highest percentage is on the failing criteria, totaling seven students.

Student learning outcomes after treatment (*Post Test*) of 78.75 with Very Good criteria indicates an increase in the average value of 20.8 from the pretest results of 58.0 (Enough criteria) to 78.75 (Very Good criteria). The following are the results of the student post-test after the treatment/application of learning with the zoom application assisted by the research statistics booklet:

Table 2. Frequency Distribution of Student Post Test Results After Using the Zoom Application Assisted by Research Statistics Booklet

Score interval	*Number of Students*	*Percentage*	*Category*
85 - 100	*9*	*45%*	*Very satisfy*
76 - 84.99	*1*	*5%*	*Very good*
70-75.99	*4*	*20%*	*Well*
60-69.99	*4*	*20%*	*Pretty good*
56-59.99	*0*	*0%*	*Enough*
46-55.99	*2*	*10%*	*Not enough*
45.99	*0*	*0%*	*Fail*
Amount	*20*	*100%*	
Average	*78.75*		*Very good*

Source: Primary data processed, 2021

During the learning process, to see student learning activities, observations were also carried out. The results of observations showed that students were very active in learning, with an average score of 43.6 in the very active category.

B. Analysis of Hypothesis Test Results (Data Analysis with Statistics)

The data analysis technique used in this study is parametric statistics with *Paired-Samples T-Test* if the data is usually distributed, while if the data is not normally distributed using non-parametric statistics. Data analysis was carried out with the help of the *Statistical Product and Service Solutions* computer program (SPSS ver. 24.0). This hypothesis test is useful to see the strength of the variable power of the research statistical booklet-based zoom application in improving student learning outcomes. Prior to testing the hypothesis, parametric statistical prerequisite tests were conducted, one of which was by looking at the normality of the data to determine whether the two data were normally distributed or not. The output of the SPSS data normality test is as follows:

Table 3. SPSS Output Data Normality Test

Tests of Normality

	Kolmogorov-Smirnov [a]		*Shapiro-Wilk*	

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ISSN : 2597-4750 (PRINTED)

	Statistics	*df*	*Sig.*	*Statistics*	*df*	*Sig.*
Pretest	*.161*	*20*	*.187*	*.930*	*20*	*.158*
Test Post	*.108*	*20*	*.200* *	*.935*	*20*	*.195*

**. This is a lower bound of the true significance.*

a. Lilliefors Significance Correction

Source: SPSS Output (Primary data processed, 2021)

To determine the normality of the data, it can be seen from the significant normality of the data on the Kolmogorov-Smirnov and Shapiro-Wilk tests contained in table 3 above. If the number Sig. is Greater than 0.05, it means that the data is normally distributed (Riadi, 2016). In the table above, it can be seen that the Kolmogorov-Smirnov test obtained Sig values of 0.187 and 0.200, and Shapiro-Wilk obtained Sig values of 0.158 and 0.195 with the value of both tests < 0.05, then these two data are normally distributed. Since both data are normally distributed, the requirements for parametric statistics can be used with the *Paired-Samples T-Test.* The output of the SPSS *Paired-Samples T-Test* is as follows:

Table 4. The output of SPSS Paired-Samples T-Test

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		mean	*Std. Deviation*	*Std. Error Mean*	*Lower*	*Upper*	*t*	*df*	*Sig. (2-tailed)*
Pairs 1	*Post Test - Pre Test*	*20,750*	*15,917*	*3.559*	*13.301*	*28,199*	*5,830*	*19*	*.000*

Source: SPSS Output (Primary data processed, 2021)

To find out whether the zoom application variable assisted by statistical research booklets can improve learning outcomes or not, it can be seen on the value of *Sig. (2-tailed)* in table 4 above, where if the number is less than 0.05, it means that there is an increase (E, 2016). In table 4 above, it can be seen in the *Sig. (2-tailed) the* value *(p) is* 0.000 > 0.05; This means that the zoom application assisted by the research statistics booklet can improve student learning outcomes.

IV. CONCLUSION

It can be seen from the learning outcomes that there is an increase in the average score of 20.8 from the pretest results of 58.0 (sufficient criteria) to 78.75 (very good criteria) in the post-test results. The results of the hypothesis test indicate that there is a significant effect of the zoom application assisted by the research statistics booklet in improving student learning outcomes in the research statistics course. Based on this analysis, the researcher concludes that in the learning process, especially e-learning, a suitable media/tool is needed to support learning, especially practical courses or calculations that require face-to-face explanations even though

ISSN : 2597-4785 (ONLINE)
ISSN : 2597-4750 (PRINTED)

they are through cyberspace so that learning objectives are achieved. The media/tools must be supported. Internet connectivity with good access.

ACKNOWLEDGMENTS

Thank you to the Chancellor through the Chair of the Community Service Research Institute (LPPkM), who has financed this research through a research grant program, and the academic community of PGRI Palembang University, who has given permission and opportunities for researchers to carry out and complete this research.

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