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RESEARCH ARTICLE

The Influence of the Project Based Blended Learning Model And Independent Learning On Visual Literacy Skills

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ABSTRACT

The aim of this research is to find out the test results: use of the PBBL model and expository method and Learning Independence towards Visual Literacy Skills in the Information Systems course. This experimental research was carried out using a 2x2 factorial design. The subjects in this research were Information Systems students at Mulawarman University the class consists of four classes with 120 students. The subjects that were the focus of the experiment were taken classically randomly, namely four classes. This research hypothesis was tested using the Analysis of Variant (Anova) statistical test. The calculation results show that: Based on the results of the analysis in this research, it can be concluded that: (1) There is a significant influence on the use of the PBBL model and the expository method towards Visual Literacy Skills in the Information Systems course. This is shown by F count = 151,261 with sig = 0.000 < 0.05. This means that there is an influence of using the PBBL model and expository methods on Visual Literacy Skills in the Information Systems course, (2) There is no influence on Learning Independence towards Visual Literacy Skills in the Information Systems course. This is shown by the value F = 16,149 with sig = 0, 000 < 0.05. This means there is no influence on Learning Independence towards Visual Literacy Skills in the Information Systems course, and (3) There is no interaction between the use of the PBBL model, expository and gender methods together towards Visual Literacy Skills in the Information Systems course. F count = 14,351 with sig = 0, 000 < 0.05. This means that the learning model does not depend on Learning Independence in influencing Visual Literacy Skills in the Information Systems course.

INTRODUCTION

The WEB Programming course is included in the Information Systems skills group of courses and is a prerequisite course for Bachelor of Information Systems students to take the next media development course, namely the development of photo media, video media, three-dimensional media, ICT-based learning, and multimedia-based learning. visual. Therefore, students in graphics courses must have adequate visual literacy skills (Avraam, 2023; Fasting & Schofield, 2023). This proves that not all Bachelor of Information Systems students have adequate visual literacy skills as web media developers (Morin et al., 2023; Sheikhibrahim et al., 2023). After taking the WEB Programming course, students should be able to develop web media according to visual media rules. So, problems can be found that: (1) The current learning strategy is not optimal in improving visual literacy skills and student learning independence related to the process of carrying out web programming assignments. (2) Competition The visual literacy skills of undergraduate students are still low, as evidenced by student work that does not meet the rules of visual media (Nida et al., 2023).

The project-based learning model is an innovative model. This learning focuses on involving students in solving problems and meaningful tasks, so that students work and construct their own knowledge, to achieve and produce real products. (Prameswari et al., 2023; Reddy et al., 2023) stated that project-based learning has the criteria: "centrality, driving question constructive investigation, autonomy, and realism". In project-based learning, the center of the learning strategy is a project where students learn concepts from a body of knowledge or science through project work. Educators act as facilitators and motivators to foster students' independent learning attitudes in carrying out the learning process. Educators must be able to design a real learning process. Project-based learning must be able to provide students with a realistic feeling, including in choosing assignments, topics, work contexts. collaboration, and so on (Martín Erro & Nuere Menéndez-Pidal, 2024; Pawloski & Wall, 2024).

Project-based learning uses a constructivist approach, this is strengthened by constructivist learning theory which states that knowledge is not simply transferred from one person to another, but must be interpreted by each person themselves. Students must construct their own knowledge because knowledge is not something that is ready-made, but rather something that is developing continuously. Students are expected to be able to discover for themselves and metamorphose complex information (Nation et al., 2023; Prasetya & Nursyahidah, 2023; Servos et al., 2023). For students to truly understand and be able to apply knowledge, they must work to solve problems, discover everything for themselves by finding contextual ideas to be able to solve problems. Vygostky argues that knowledge is shared socially, in the sense that participants involved in a social interaction will contribute and build together the meaning of knowledge. Thus, the processes that occur will vary according to the context. The use of the Learning Content Management System (LCMS) as an online learning environment in the project-based learning model is expected to facilitate learning and answer learning needs in the era of industrial revolution 4.0, learning anywhere at any time, this is strengthened by Encounter theory by Rod Sims and John Hedberg in their book entitled Interactions in Online Education in 2006 which states that learning carried out in an online environment must be able to accommodate like classical meetings, therefore a teacher must be able to provide an online learning environment that can improve communication, online interaction and involvement. The Learning Content Management System that will be used as a tool in this research is Moodle because it is considered compatible to implement each syntax in the learning model being developed. The project based blended learning model is expected to foster an attitude of independent learning as part of character education in higher education, including in this case how independent students learn to respond to assignment deadlines given in a mutually agreed project schedule. Independent learning does not plagiarize ideas when they produce graphic media and several indicators of student learning independence related to the lectures they take (Evandel et al., 2024; Rosita et al., 2024; Suryanti et al., 2024).

Based on the needs analysis and theoretical and empirical studies that have been described, the learning model adapts the project based learning model in collaboration with the learning delivery method, bl e nded learning. (Bte Abustang et al., 2024; Muchsinan et al., 2024; Yestina et al., 2024). In the integrated blended learning project-based learning model, students will have a different learning experience compared to traditional classes. They can interact without the limitations of distance and time like presentations in traditional classes. They can argue more freely and analyze and evaluate Information Systems between friends through the web media products they produce so that it is a means of improving their visual literacy skills. Based on empirical data in the field, the online learning environment has several advantages including, (1) Everyone is controlled by connecting people, (2) Accommodates personal/individual, (3) Users can interact with various existing features including images/visuals, (4) Free and practical to use, user friendly, (5) Unlimited space, distance and time (Lailatussaadah et al., 2024; Purbosari et al., 2024).

In the project-based learning model, students must display their work and analyze their work. Work analysis is carried out between students to provide input and suggestions related to the work produced so that it can be used as a basis for improving work and increasing visual literacy skills (making visualizations). Work analysis carried out manually in class will take a lot of time and cannot

accommodate visual analysis abilities of all students, usually only a few students argue while the others are just listeners. This is one form of students' lack of independent learning attitude towards the learning process they participate in. By uploading works to the online environment, it is hoped that these shortcomings can be overcome. So, it is hoped that students' visual literacy skills and independent learning attitudes can increase.

RESEARCH METHODS

This research uses a true experimental design, because this research pays attention to the possibility of moderator variables that influence the treatment (independent variable) on the results (dependent variable). This research involved two groups, namely the experimental group and the control group. The experimental activities in this research were carried out on a group of students in the Bachelor of Information Systems class at Mulawarman University, consisting of classes A and B. Both classes had equal or homogeneous abilities so group selection was carried out by lottery. After drawing lots, classes C and D were selected as the experimental group given learning using the PBBL model and classes A and B were selected as the control group given the expository method.

Overall, the treatment in the form of the PBBL model and expository method is carried out using the steps below: (1) Carrying out a pre-test using instruments in the form of Information Systems course questions with the aim of seeing students' initial abilities, students are grouped based on Learning Independence. The pre-test is carried out once before the PBBL model and expository method are implemented, (2) Carrying out research by applying the PBBL model and expository method based on Learning Independence, and (3) Carrying out a post-test using an instrument in the form of Visual Literacy Skill evaluation questions in the Information Systems course according to the indicators to be achieved from each cycle. The post-test was carried out four times after the PBBL model and expository method were implemented.

According to (Creswell, 2015), the population is the entire research object. A population can be a collection or group whose members are people, events, or objects. Population is not just a number, but includes all the characteristics or traits possessed by the subject or object being studied. (Kerlinger & Lee, 2000) suggests that the population is all members of research subjects who have similar characteristics. This population consists of a number of objects to be studied and at least have the same characteristics or properties. The population in this study were all undergraduate students of Information Systems at Mulawarman University.

The sampling method was carried out in several steps, namely using a purposive simple random sampling technique. This technique is used to select randomly without paying attention to the strata in the population. This method is used because members of the population are considered homogeneous. The sample size was determined as two (2) classes, one (1) class as the experimental group and one (1) other class as the control group. The sample was determined by matching, namely by placing equal numbers of individuals in the experimental group and the control group. This research sample was grouped into an experimental group and a control group. To prove that Mulawarman University's Bachelor of Information Systems, both A and B and classes C and D have equivalent qualifications, reliable data is needed by conducting a pre-test, which is then tested with the help of the SPSS program. From the results of this analysis, it can be concluded that there is no difference in the pre-test scores for the Information Systems course between the experimental class and the control class or it could also be said that the abilities of the Information Systems course are relatively the same.

The sampling method was carried out in several steps, namely using purposive simple random sampling as follows: (1) To select schools and the treatment group was used simple random sampling. Sampling was carried out using a random technique by drawing lots, and (2) Purposive was used to determine the class. The Bachelor of Information Systems class at Mulawarman University was chosen because the class had already adapted to the school and would not have to face the final exam. Based on this method, classes A and B were obtained as control classes while classes C and D were experimental classes.

In principle, research is measuring social and natural phenomena. Researching with existing data is more accurately called making a report rather than conducting research. However, at the lowest scale, reports can also be stated as a form of research. Because research is taking measurements, there must be good measuring instruments. Measuring tools in research are usually called research instruments. So, a research instrument is a tool used to measure observed natural and social phenomena. The instruments used in this research were observation sheets and test questions.

In carrying out research, there are two things that influence the quality and results of research, namely (1) the quality of research instruments regarding the level of validity and reliability of the instruments, (2) regarding the quality of data collection regarding the accuracy of the methods used to collect data. Data collection is a very important step in research. Because the data obtained will be used in hypothesis testing.

Data collection can be done in various settings, various sources, and various ways. In this research, the data collection techniques used were, (1) observation of learning activities and (2) Visual Literacy Skill test in the Information Systems course.

In this research design, data collection was carried out twice, namely before and after the experiment. Data collection carried out before the experiment is called pre-test and data collection after the experiment is called post-test. The difference between the results given in the pretest and post-test is assumed to be the effect of the treatment.

Based on the problems raised in this research, the statistical analysis used in analyzing research data is descriptive statistical analysis, namely analysis of variance (ANOVA), because the form of statistical data in this research is descriptive statistics, presenting data in tabular form, calculating standard averages. deviation, because the researcher wants to describe the data collected as it is, generalize/conclude, and analyze it to test the hypothesis.

There are three hypotheses in the research, each of which is related to each other. In this research there are three variables, namely: (1) The first independent variable (X1) namely the PBBL model and the second independent variable (X2) namely the expository method (2) The moderator variable (X3) namely Learning Independence (3) The dependent variable (Y) is Visual Literacy Skill in the Information Systems course.

To test the hypothesis in this research, the one-way F anova test analysis technique (Oneway Anova) was used to test hypotheses one and two, while hypothesis three used the two-way F anova test analysis technique (Twoway Anova). Testing these hypotheses using the SPSS 2 5 statistical computer program.

RESEARCH RESULT

The data obtained from the results of field research were processed by the author. Data processing in a study was carried out to find answers to the problem formulation that had been previously posed. Data analysis was carried out using the statistical computer software program Statistical Product and Service Solution (SPSS) 25.

Data generated through tests Visual Literacy Skills in Information Systems and expository methods courses. Visual Literacy Skill test data in Information Systems courses and expository methods are then combined by equalizing the score (t-score). The results are figures obtained from two sample groups, namely the PBBL model group and expository methods. The instrument was given to each group twice, namely during the pre-test and post- t-test.

Below we will explain the results of the description of the data from each group taken. Data obtained from research for undergraduate students of Information Systems at Mulawarman University using the PBBL model After processing with the help of the SPSS 2 5 application, it can be seen in table 4.1 below.

Table 1. Description of PBBL model data and expository methods

Descriptive Statistics

Dependent Variable: learning outcomes

method	learning independence	Mean	Std. Deviation	N
Model PBBL	high	69.7941	6.49839	34
	low	76.5769	5.06101	26
	Total	72.7333	6.77950	60
Expository method	high	62.4000	1.84391	15
	low	62.6000	1.86353	45
	Total	62.5500	1.84506	60
Total	high	67.5306	6.47142	49
	low	67.7183	7.57097	71
	Total	67.6417	7.11466	120

From the e l tab above it can be seen that in the PBBL model with respondents of 60 students consisting of 34 students who had high learning independence and 26 students who had low learning independence, had an average score of 69.7941 with a standard deviation of 6.49839 for students who had high learning independence and an average score of 76.5769 with a standard deviation of 5.06101. If we refer to the minimum completeness score (KKM) set at Mulawarman University Information Systems Bachelor's Degree, namely 70, then students who study use the PBBL model has a value above the KKM. Data obtained from research for undergraduate students of Information Systems at Mulawarman University using the PBBL model After processing with the help of the SPSS 2 5 application, it can be seen in table 1 above.

From the tab e l above it can be seen that the expository method with 15 students as respondents having high learning independence and 45 students having low learning independence, has an average score of 62, 400 0 with a standard deviation of 1.84391 for students having high and average learning independence score 62.6000 with a standard deviation of 1.86353. If we refer to the minimum completeness score (KKM) set for undergraduate students in Information Systems at Mulawarman University who study using the expository method, they have a score less than the KKM.

Test the hypothesis using the statistical program 2 5 to obtain results as presented in the Anova table as follows:

Table 2. Hypothesis Testing Results

Tests of Between-Subjects Effects

Dependent Variable: learning outcomes

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	3789.287[a]	3	1263.096	65.577	.000
Intercept	469770.426	1	469770.426	24389.405	.000
method	2913.466	1	2913.466	151.261	.000
Learning_independence	311.042	1	311.042	16.149	.000
method * Learning_independence	276.427	1	276.427	14.351	.000
Error	2234.305	116	19.261		
Total	555071.000	120			
Corrected Total	6023.592	119			

a. R Squared = .629 (Adjusted R Squared = .619)

First hypothesis

Differences in Visual Literacy Skills in the Information Systems course, a group of students who took part in learning using the PBBL model and groups of students who follow the expository method. The results of the analysis show that the F value for using the learning model is 151.261 with sig = 0.000

< 0.05, which means Ho is rejected and Ha is accepted meaning "there is a difference in Visual Literacy Skill in the Information Systems course, a group of students using the PBBL model and groups of students who use expository methods".

Second hypothesis

Differences in Visual Literacy Skills in the Information Systems course between groups of students who have high learning independence and those who have low learning independence. From the table above, the value F = 16,149 is obtained with sig = 0, 000 < 0.05, which means Ho is rejected and Ha is accepted, so "there is an influence of Learning Independence on Visual Literacy Skills in the Information Systems course.

Third hypothesis

From the table above, the value F = 14,351 with sig = 0, 000 < 0.05 is obtained. means Ho is rejected and Ha is accepted then "there is an interaction between the PBBL model with Independent Learning towards Visual Literacy Skills in the Information Systems course ".

DISCUSSION

Use of the PBBL model and Expository Method for Information Systems courses

model is the way lecturers choose to systematically manage learning activities from several learning components (learning materials, students, time, tools, materials, learning methods and evaluation) in achieving the set goals. There are many approaches that can be used by lecturers, including the PBBL model and the Expository method.

PBBL model is part of a learning model with a constructivist approach, because students actively build their own knowledge based on what students know. The role of lecturers in determining teaching and learning patterns in the classroom is not determined by methodical didactics "just what will be studied, but rather on how to provide and enrich children's learning experiences. Learning experiences are gained through a series of activities to explore the environment through active interaction with friends, the environment and other sources.

Learning needs to be changed from just understanding scientific concepts and principles, namely to the content of science. Students must also have the ability to do something using scientific concepts and principles that have been mastered, meaning that learning to know and learning to do occurs.

These findings show that viewpoint as a starting point in developing the PBBL model is effectively used as a model for students to improve Visual Literacy Skills in Information Systems courses that are better classical in class, groups and individually. According to (Sepang et al., 2022) with the title Implementation of Blended Learning to Increase Nursing Students' Learning Independence During the Covid-19 Pandemic, it can be concluded that the implementation of blended learning methods during the Covid-19 pandemic can improve nursing students' learning outcomes. Based on the results from respondents regarding the implementation of blended learning in learning which is very good, so that this proves an increase in student learning outcomes, it is concluded that blended learning is more effective than classes with a face-to-face or online approach only. Based on the results from respondents regarding student independence, there are four important points that support the success of blended learning, namely self-confidence, discipline, initiative and responsibility from students so that learning independence increases. Meanwhile, there is a PBBL model in learning with Visual Literacy Skills in the Information Systems course plays an important role in the development of Visual Literacy Skills individually (Fitria et al., 2023; Imelda Nur Aryanti & Rusnilawati, 2022; Robbani, 2022).

Learning activities by applying the PBBL model, especially for undergraduate students of Information Systems at Mulawarman University students are able to propose seven principles for implementing contextual learning. In connection with the application of contextual learning, lecturers need to adhere to the following principles: (1) Plan learning in accordance with students' reasonable mental development, (2) Form interdependent learning groups, (3) Provide an environment that supports

independent learning, (4) Consider diversity students, (5) Paying attention to students ' multi-intelligence, (6) Using questioning techniques to improve learning, and (7) Applying authentic assessment.

method is a learning approach that is carried out by combining various methods in the form of the lecture method. giving assignments and asking questions. Learning using the expository method is centered on the lecturer, where the lecturer will provide all lesson material using the lecture method, accompanied by assignments and questions and answers. In this learning approach, the lecturer is active in learning activities, while students only passively listen to the lecturer 's explanation of the material and carry out assignments from the lecturer according to the material provided by the lecturer.

In the expository method, students only listen to the lecturer 's explanation, so the material they receive is just memorized, and usually doesn't last long. Meanwhile, in the contextual approach, students actively learn in a group that has varying levels of ability so that students will be able to help each other, where students with high abilities can help their friends with low abilities. Apart from that, in the contextual approach the lecturer only explains the outline and objectives of the learning, students must learn actively in one group by discussing the material until they understand the material.

This research proves that the Information Systems course at Mulawarman University uses the PBBL model more effective than the expository method. This can be seen from the average student scores if the PBBL model is used 72.7333 and if the expository method is used 62.5500. From the results of calculations using the SPSS program, it was obtained that the sig level = 0.000 < 0.05.

2. The Influence of Independent Learning on Visual Literacy Skills in the Information Systems course

Learning Independence essentially has a very significant influence on Visual Literacy Skills in the Information Systems course. This is proven by the results of research which states that Learning Independence has an influence on Visual Literacy Skills in the Information Systems course. The following is a summary of the analysis of the influence of Learning Independence on Visual Literacy Skills in the Information Systems course. From the analysis that has been carried out, it can be seen that the value of F = 161.149 with sig = 0, 000 < 0.005 So it can be concluded "There is an influence of Learning Independence on Visual Literacy Skills in the Information Systems course.

The above results are supported by research (Budi, 2023) with the title Application of the Project Based Learning (P j BL) Model to Increase Student Achievement and Learning Independence in Skills Subjects in Class X IPA2 then It can be concluded that the Project Based Learning (PjBL) model can improve student achievement and learning independence. There was a significant increase between cycle I, cycle II and cycle III. Learning achievement experienced a significant increase between cycle I, cycle II and cycle III. The average score of student learning independence experienced an increase, in cycle I it was 73.6 and in cycle II it was 76.5 and cycle III it was 88.1. The average score for learning achievement in cycle I was 67.5, cycle II was 71.6 and cycle III was 73.5.

This research evidence is also supported by statements (Kasiyanti & Nur Hayati, 2023) (1) there is a difference in student learning independence between the experimental class and the control class or the first hypothesis (H1) is accepted, with a significance value of 0.007 < 0.05. This means that student learning independence using the PjBL model is higher than the Direct Learning model, (2) there are differences in student learning discipline between the experimental class and the control class or the second hypothesis (H2) is accepted, with a significance value of 0.000 < 0.05. This means that student learning discipline using the PjBL model is higher than the Direct Learning model, and (3) the PjBL model is effective in increasing student learning independence and discipline. This means that the PjBL model is more effective in increasing student learning independence and discipline compared to the Direct Learning model. PBBL model factors is the main reason that causes the influence of Learning Independence on Visual Literacy Skills in the Information Systems course.

Interaction of Using the PBBL model with Learning Independence on Visual Literacy Skills in the Information Systems course

Based on the data analysis presented, it can be concluded that the value F = 14,351 with sig = 0, 000 < 0.005 is obtained. Therefore, it can be said that (Ha) which reads: there is an interaction between the PBBL model, the expository method and Independent Learning towards Visual Literacy Skills in the Information Systems course was accepted**.** Meanwhile (Ho) which reads: there is an interaction of the PBBL model, expository method with Independent Learning towards Visual Literacy Skills in the Information Systems course was rejected**.** This means the PBBL model and Learning Independence in influencing Visual Literacy Skills in the Information Systems course.

The principle of lifelong learning is reflected through the ability to learn, students will be able to learn to solve every obstacle they face until the end of their lives, in line with the four pillars of universal education formulated by UNESCO, namely (1) learning to know, which means learning is oriented towards the learning process, (2) learning to do, which means the learning process is oriented towards experience, (3) learning to be, which means learning is to form humans who become themselves, and (4) learning to live together, which means learning to work together.

In line with the four pillars formulated by UNESCO above, learning objectives can be achieved well if one of them is supported by choosing a good learning model. According to Nieven, quoted by Trianto, a learning model is said to be good if it meets the criteria (1) valid, (2) practical, (3) effective. The success of students in learning does not depend on differences in Learning Independence but depends on the extent to which there is intellectual-emotional involvement of students through the activities of experiencing, analyzing, acting and forming attitudes, as well as the active and creative participation of students during the implementation of learning.

This third hypothesis is supported by opinion (Robbani, 2022) with the title The Effectiveness of Implementing the Blended Learning Learning Model Using the Microsoft Teams Application on Learning Independence and Student Learning Outcomes at SMPN 5 Surabaya that the results of this research discuss the effectiveness of the blended learning learning model using the Microsoft Teams application on student learning independence and student cognitive learning outcomes factually and in detail, where the blended learning model has significant effectiveness on the independence and learning outcomes of class VII C students at SMPN 5 Surabaya.

This research is also supported by the statement (Mutini et al., 2022) with the title Blended Learning Learning Model in Building Student Learning Independence that the results of this research are: (1) Planning for the Blended Learning learning model in Building Student Learning Independence at SDN Pulosari 03 and SDN Kromasan Ngunut District, Tulungagung Regency, this is done by making lesson plans, Promes, Prota, syllabi and other plans needed to carry out the learning process, for example applying online learning methods and demonstration methods. (2) Implementation of the Blended Learning learning model in building student learning independence, which is carried out using the Moodle Group WA application, Classroom, Google Form, or combined with Google Form or You Tube. Offline learning is carried out using discussion methods and lecture methods. (3) Evaluation of the Blended Learning learning model in Building Student Learning Independence at SDN Pulosari 03 and SDN Kromasan, Ngunut District, Tulungagung Regency was carried out by: scheduling learning use, keeping records of student learning progress, motivational management and learning control. Apart from that, process evaluations, mid-semester assessment evaluations and final semester assessment are carried out. there is an interaction between using the PBBL model, the expository method and Independent Learning towards Visual Literacy Skills in the Information Systems course. This means that the learning model depends on Learning Independence in influencing Visual Literacy Skills in the Information Systems course student.

CONCLUSION

Based on the results of the analysis in this research, it can be concluded that: (1) There is a significant influence on the use of the PBBL model and the expository method towards Visual Literacy Skills in the Information Systems course. This is shown by calculated F = 151,261 with sig = 0.000 < 0.05. This

means that there is an influence of using the PBBL model and expository methods on Visual Literacy Skills in the Information Systems course, (2) There is no influence on Learning Independence towards Visual Literacy Skills in the Information Systems course. This is shown by the value F = 16,149 with sig = 0, 000 < 0.05. This means there is no influence on Learning Independence towards Visual Literacy Skills in the Information Systems course, and (3) There is no interaction between the use of the PBBL model, expository and gender methods together on Visual Literacy Skills in the Information Systems course. F count = 14,351 with sig = 0, 000 < 0.05. This means that the learning model does not depend on Learning Independence in influencing Visual Literacy Skills in the Information Systems course.

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