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IMPLEMENTATION A PROBLEM-BASED LEARNING MODEL TO INCREASE LEARNING CONNECTEDNESS AND REDUCE LEARNING LOSS

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Abstract

The potential for learning loss and decreased learning connectedness can decrease lecturers' knowledge and skills. Efforts to increase learning connectedness through developing online learning platforms based on learning activities have been carried out on various campuses in Indonesia. This research aims to implement a Problem-Based Learning (PLB) model to increase learning connectedness and reduce learning loss. The PLB model was carried out online for 13 weeks. Synchronous online learning process through Zoom meetings, 9 meetings, 2 asynchronous discussion meetings using social media with WhatsApp (WA) Group, and 2 meetings via E-learning platform of Learning Management System (LMS), Universitas Negeri Padang specifically to provide lesson plans and teaching materials. At the end of the lecture, an online questionnaire was distributed to 165 students as respondents, who were determined by the purposive sampling technique. Data were analyzed using quantitative descriptive techniques. The results of this results indicate that online learning with the PLB model can increase learning connectedness and reduce learning loss.

Keywords: Problem-Based Learning, Learning Connectedness, Learning Loss.

1. INTRODUCTION

During the COVID-19 pandemic, most universities in the world (especially in Indonesia) have affected teaching and learning, with two-thirds reporting replacing classroom teaching with distance learning (Makruf *et al*., 2022). Where some education system components are not ready for emergencies in implementing online distance learning. Marinoni *et al* (2020) stated that the sudden and unexpected global shift to online teaching caused difficulties from several aspects, namely 1) access to online systems; 2) lecturers and understudies' competencies and pedagogy for distance learning; and 3) requirements of specific fields of research.

Understudies were dissatisfied with online learning during the COVID-19 Pandemic because it was ineffective, Where the availability of internet network infrastructure is still constrained (Darmansyah & Darman, 2021). Puspitarini & Hanif (2019) add support for information technology devices owned by understudies to access learning materials is still not evenly distributed. The readiness of lecturers in designing teaching materials and learning media is still not optimal. Method selection and classroom management need adjustments when switching to online learning. Learning evaluation requires adjustment to the characteristics of online learning that are different from face-to-face. Are online classes effective for the learning process for understudies? this is often the subject of debate. Online classes can lead to a disconnection between understudies and their lecturers. Chand *et al* (2022) explain understudies in online classes felt more disconnected from their peers and lecturers, more independent in their studies, and less assisted by their lecturers. They feel that educators do not care about them or how well they do in class when they cannot meet

in person or when understudies take a long time to get a response from the lecturers. This sense of community can lead some understudies to succeed in their studies. Brown (2021) adds online learning resulted in dissatisfaction with interactions, minus teaching materials, and suboptimal communication with lecturers and other understudies.

Online learning can be more meaningful if understudies are directed to problem-solving through thinking, analyzing, evaluating, generating, and communicating ideas. Exposure to problems in the PBL model syntax material can develop critical attitudes, thinking skills, and problem-solving for understudies (de Oliveira Biazus & Mahtari, 2022). The PBL characteristics that emphasize problem-solving and the ability to communicate with other class members with a critical attitude can increase connectedness with educators and learning resources. Increased connectedness in learning will reduce the occurrence of learning loss.

Applying the PBL model aims to develop practical thinking skills, problem-solving skills, and independent learning (Sari *et al*., 2021). Loyens *et al* (2015) stated that PBL has a positive influence on 1) helping understudies build a broad and flexible knowledge base; 2) helping understudies become effective collaborators; 3) improving practical problem-solving skills; 4) motivating understudies to learn intrinsically; 5) develops independent learning skills; 6) building a knowledge base; 7) being an effective collaborator; 8) intrinsically motivating; and 8) developing independent learning skills will encourage learning connectedness. Increased learning connectedness and problem-solving abilities will reduce learning loss. This research aims to implement online education based on PBL to improve and increase learning connectedness and reduce learning loss, which is the main problem in online learning.

2. METHODS

This research involved four (4) understudies taking the basics of educational science courses. Learning is carried out online by applying PBL. Understudies are asked to participate in this research by accessing teaching materials, media, and assignments and filling out the attendance list through the LMS UNP e-learning platform. The respondents were 165 students who took online lectures for 13 weeks. Learning was carried out with 9 Zoom meetings, 2 discussion meetings using WA Group social media, and 2 meetings through the LMS UNP E-learning platform. In week 14, questionnaires were distributed to understudies focusing on learning loss and learning connectedness. Sampling using a purposive sampling technique (Hasan & Bao, 2020; Haider & Al-Salman, (2020). Applied stages in this research were adapted from Arends (2004) for PBL consisting of 5 steps, namely 1) student orientation; 2) organizing understudies; 3) guiding individual and group; 4) developing and presenting; and 5) analyzing/evaluating the problem-solving process.

3. RESULT AND DISCUSSIONS

3.1 Analysis results

The analysis results of the questionnaire responses given to students began by comparing the answers in the reports given. Based on the 165 respondents' answers, 93.58% of participants stated that they took online classes, and 6.42% did not participate in learning activities. More details can be seen in Table 1 below.

Table 1: Implementation of PBL online

No	Questionnaire	Online			
		Yes		No	
		Total	%	Total	%
Q1	Is there a student orientation on problems in learning?	160	96.97	5	3,03
Q2	Is there a student organizationfor learning in learning?	158	95.76	7	4,24
Q3	Is there individual guidance/group investigations in learning?	150	90.91	15	9,09
Q4	Is the learning done presenting the results of the investigation?	145	87.88	20	12,12
Q5	Is learning done by analyzing/evaluating the problem-solving?	159	96.36	6	3,64
Average			93.58		6,42

The data obtained from the questionnaire about learning connectedness uses three (3) indicators, namely: 1) understudies collaboration; 2) computer competency; and 3) lecturer support. Each of the three (3) indicators is designed with five (5) questions. The answer choices provided use a Likert scale model (4 = very good; 3 = good; 2 = not very good; 1 = not good).

Understudies collaboration (A) consists of five (5) questionnaires, namely: 1) interaction between understudies; 2) assistance from other understudies; 3) responses from other understudies; 4) sharing learning resources with other understudies; and 5) receiving learning resources from other understudies. The average score from five (5) questionnaires is Mean = 3.27 from a maximum score of 4; Standard Deviation (SD) = 0.55 (achievement 81.70%). This score indicates that understudies collaborations have been achieved well.

Computer competence (B) also consists of five (5) questionnaires, namely: 1) have a computer; 2) use the internet; 3) the ability to solve problems; 4) select information from the internet; and 5) store information on the computer. The average score from five (5) questionnaires is Mean = 2.97 from a maximum score of 4; SD = 0.61 (72.44% achievement). This score indicates that the understudies computer competence is in good condition but not yet optimal.

Lecturer support (C) consists of five (5) questionnaires, namely: 1) encouraging learning participation; 2) answering understudies questions; 3) paying attention; 4) answering questions; and 5) verifying understudies answers. The average score from five (5) questionnaires is Mean = 2.97 from a maximum score of 4; SD = 0.60 (achievement 74.15%). This score indicates that lecturer support has been given well but is still not optimal. More details can be seen in Table 2 below.

Table 2: Results of learning connectedness data processing

Variable	Indicator	Questionnaires	Score	Mean	SD	%
Learning connectedness	A	1. The quality interaction between understudies in online lectures?	496	3.01	0.6	75.15
		2. I ask for help from other understudies in lecture activities	520	3.15	0.54	78.79
		3. Other understudies give feedback on the activities I have done	540	3.27	0.60	81.82
		4. I shere learning resources and information with other understudies	580	3.52	0.43	87.88
		5. Other understudies learning resources and ionformation with me	560	3.39	0.60	84.85

	Mean		539	3.27	0.55	81.70
	B	1. I have the competence to use a computer	500	3.03	0.70	75.76
		2. I use the internet to find information	475	2.88	0.60	71.97
		3. I can solve if there is a problem using the internet	461	2.79	0.57	69.85
		4. I can select documents from the internet	468	2.84	0.60	70.91
		5. I can store information electronically on my computer	486	2.95	0.60	73.64
	Mean		478	2.90	0.61	72.42
	C	1. Lecture encourage my participation in learning	489	2.96	0.60	74.09
		2. The lecturer immediately answered my question	492	2.98	0.60	75.55
		3. Lecturer pays attention to every lectures	502	3.04	0.60	76.06
		4. The lecturer answered the group's question immediately.	461	2.79	0.45	69.85
		5. Lecturer verifies the results of group discussions in each lecture	503	3.05	0.60	76.21
	Mean		489	2.97	0.60	74.15

In obtaining learning loss data, four (4) indicators are used, namely 1) active learning; 2) material environment; 3) information design and appeal; and 4) reflective thinking. Active learning consists of five (5) questionnaires, namely 1) feedback from understudies to increase motivation; 2) feedback from lecturers to increase motivation; 3) feedback to overcome difficulties; 4) satisfaction with recovery; 5) satisfaction with group quality; 6) satisfaction on the quality of the questions; and 7) satisfaction with the quality of the responses of the discussion participants. The average score from the seven (7) questionnaires is Mean = 2.91 from a maximum score of 4; SD = 0.56 (achievement 72.79%). This score indicates that lecturer support has been given well but is still not optimal.

Information design and appeal (B) consists of six (6) questionnaires, namely 1) the completeness of the discussion material; 2) the quality of the material delivered; 3) the number of reference materials for each topic used; 4) the quality of the teaching media received; 5) the quality of the message design delivered in each discussion topic; and 6) satisfaction with learning media used. The average score from the six (6) questionnaires is Mean = 2.94 from a maximum score of 4; SD = 0.59 (achievement 73.42%). This score indicates that lecturer support has been given well but is still not optimal. Material environment (B) consists of five (5) questionnaires, namely 1) provide instructions for the completeness of learning; 2) use of software that is suitable for learning; 3) can install software that is appropriate for learning; 4) use of required software applications; and 5) software applications used running smoothly. The average score from the six (6) questionnaires is Mean = 2.97 from a maximum score of 4; SD = 0.62 (achievement 74.21%). This score indicates that lecturer support has been given well but is still not optimal. Reflective thinking (C) consists of seven (7) questionnaires, namely 1) the use of the internet for learning; 2) there are no obstacles in accessing or reading the material; 3) controlled learning when reviewing the material used; 4) the use of blended models helps connected learning; 5) the quality of learning is as expected; 6) feeling happy when learning online; and 7) feeling happy to learn more through face-to-face. The average score from the six (6) questionnaires is Mean

= 2.93 from a maximum score of 4; SD = 0.62 (achievement 73.21%). This score indicates that lecturer support has been given well but is still not optimal. More details can be seen in Table 3 below.

Table 3: Results of learning loss data questionnaire processing

Variable	Indicator	Questionnaires	Score	Mean	SD	%
Learning loss	A	1. Feedback given by understudies increases my motivation	498	3.02	0.50	75.45
		2. The feedback given by the lecturer increases my motivation	506	3.07	0.60	76.67
		3. Feedback from activities/quizzes helps to solve my difficulties	499	3.02	0.43	75.61
		4. I am satisfied with the responses given in every lecturer	498	3.02	0.52	75.45
		5. I am satisfied with the activities of group members given each	471	2.85	0.60	71.36
		6. I am satisfied with the quality of question from class	463	2.81	0.60	70.15
		7. I am satisfied with the quality of responses from class	471	2.85	0.70	71.36
	Mean		480	2.91	0.56	72.79
	B	1. Completeness of the material discussed in each lecture	490	2.97	0.06	74.24
		2. The quality of the material delivered by the group of	494	2.99	0.65	74.85
		3. The number of reference materials for each discussion topic	498	2.96	0.60	74.09
		4. The quantity of teaching media received during learning	496	3.01	0.54	75.15
		5. The quality of the message design in the presentation media	472	2.86	0.60	71.52
		6. I am satisfied with the learning media used by the presenter	472	2.86	0.60	71.52
	Mean		485	2.94	0.60	73.42
	C	1. Instructions given to use learning tools	470	2.85	0.60	71.21
		2. The software I use is suitable for fully participating in lectures	476	2.88	0.70	72.12
		3. I can install the appropriate software required to participate in	506	3.07	0.60	76.67
		4. All software applications required to participate in this course	499	3.02	0.65	75.61
		5. The use of software applications runs smoothly	498	3.02	0.60	75.45
	Mean		490	2.97	0.63	74.21
	D	1. I use the internet to learn to stimulate	471	2.85	0.60	71.36
		2. I have no problem accessing and reading materials	463	2.81	0.60	70.15
		3. I feel in control of learning when i review the material given	471	2.85	0.55	71.36
		4. I feel that the blended learning model that is pplied helps in	490	2.97	0.60	74.24
		5. The overeall quality of learning in lectures goes as expected	492	2.98	0.55	74.55
		6. I feel happy I learn through online	502	3.04	0.60	76.06
		7. I fell happy to learn more face-to-face	461	2.97	0.60	69.85
	Mean		483	2.93	0.59	73.21

3.2 Discussions

Online learning can positively impact understudies with certain conditions. The less confrontational or personal nature of e-learning may encourage shy understudies to engage more or feel less pressure than in face-to-face interactions (Dzemidzic

Kristiansen *et al*., 2019). According to Tsegay *et al* (2022), understudies may feel more willing to ask questions and interact with lecturers and other understudies, thereby increasing connection in the classroom. One of the benefits of taking online classes is the lack of peer pressure. The less confrontational nature of online learning may encourage shy understudies to feel less pressured than their peers.

During the online learning process, the emergency caused by the COVID-19 Pandemic had a tremendous impact on learning loss. Learning loss depends explicitly on the level of education and the form of knowledge taught by educators to understudies. Therefore the measurement of learning loss is also very varied.

As of now, among lecturers and instructors, there appears to be an inner feeling of being required to make up for the misplaced time at the beginning of this school year, coming about in an overemphasis on getting as much data into understudies heads as conceivable.

The concept of learning misfortune to understudies getting virtual instruction or remove learning amid COVID-19 widespread in light of the rigid prerequisites of California Senate Act 98 (SB 98) for all schools to supply day-to-day, hands-on interaction, educating identical substance regions for coordinate instruction get to, get to network and gadgets, and other scholastic bolster (Cummins, 2020). To move forward with learning at increasing speed all lecturers, counting the chairman and staff, must end up facilitators of information (Lalas & Strikwerda, 2020).

The lecturers and instructors must give a secure virtual space that permits understudies to direct the discussion. It is additionally significant to utilize appraisal and check comprehension to get who understudies are and how they learn. Making an environment with pertinent exercises that understudies can relate to and discover pleasant will offer assistance to them in making meaning and having a fruitful learning encounter.

The move to educating and learning through virtual spaces has developed the computerized separate instructive disparities experienced primarily by truly marginalized understudies (Hollingsworth, 2020). Even though schools have been upbeat and liberal in disseminating electronic gadgets and hot spots to assist in giving rise to learning conditions, imbalances are presently unavoidable (Schneiderman, 2017). Indeed with these imbalances, understudies take what they know and have learned and discover ways to construct, apply, and extend their information in significant and significant ways.

Learning loss is mainly studied due to the short-term effects of weather and climate events, natural disasters, strikes, and summer vacations. Understudies have no or little access to education in most of these scenarios. Due to the COVID-19 Pandemic, most countries have planned and implemented interventions where students can access education.

According writing Reimers & Marmolejo (2022), on March 16, 2020, Turkey closed all schools nationwide and implemented two (2) different approaches called EBA TV and eba.gov.tr (EBA stands for Educational Informatics Network), a broadcast television portal and an Internet portal for children to access education. The reason for making these two portals is to provide access to the highest number of students at the K-12 level.

4. CONCLUSIONS

Based on the data analysis described in the research results above, several conclusions can be drawn regarding learning connectedness and learning loss through the application of PBL that is carried out online. Overall, it can be stated that the PBL model applied in online learning can contribute to increasing connectedness in knowledge. This result can be seen from several indicators of understudies' collaborators running well. The computer competencies possessed by understudies are still in good condition even though they are not optimal. It is mainly related to skills to support online learning. This research also revealed that the support from lecturers went well, although it was not optimal either. The PBL model allows understudies to learn independently in groups with five (5) predetermined steps. Understudies are allowed to develop their learning in groups, so it is felt that the role of the lecturer as a supporter is still not optimal. The analysis of learning loss, as described in the research above, can be concluded that overall it consists of four leading indicators: 1) active learning; 2) information design; and 3) appeal. Material environment and reflective thinking have succeeded in reducing learning loss. The active learning indicators show the results, although they are not optimal. Furthermore, it can be concluded that the information design and appeal have received a good response. Regarding the material environment, the average has been going well because understudies have adequate supporting skills for online learning. It can also be seen that the results of his research in reflective thinking have also gone well, although not optimally.

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