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THE EFFECT OF PROBLEM-BASED BLENDED LEARNING AND LEARNING AUTONOMY ON STUDENTS' LEARNING OUTCOMES IN ACCOUNTING

O EFEITO DA APRENDIZAGEM COMBINADA BASEADA EM PROBLEMAS E DA AUTONOMIA DE APRENDIZAGEM NOS RESULTADOS DE APRENDIZAGEM DOS ALUNOS EM CONTABILIDADE

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ABSTRACT

This study aimed to investigate the effect of problem-based blended learning and learning autonomy on students' learning outcomes. A quantitative approach was adopted in the form of a quasi-experimental design in this study. Sixty students who took accounting classes were selected as a research sample by using a simple random technique. The data were gained through observations, surveys, and tests. The study instruments were observation sheets, questionnaires, and multiple-choice tests. The data were analyzed descriptively and inferentially with the assistance of SPSS 25. The findings revealed that; ; 1) there is a different learning outcome gained by the students taught with problem-based blended learning and the students taught with conventional learning, 2) there is an interactional effect between problem-based blended learning and learning autonomy on students' learning outcomes, 3) students with high learning autonomy taught by the problem-based blended learning outperform students taught by the conventional method, 4) students with low learning autonomy taught by the conventional method outperform students taught by problem-based blended learning. Those findings implicate the implementation of problem-based blended learning in enhancing students' learning outcomes through learning autonomy.

Keywords: Blended learning, Learning autonomy, Learning outcomes, Problem-based learning.

RESUMO

O objetivo deste estudo foi investigar o efeito da aprendizagem combinada baseada em problemas e da autonomia de aprendizagem nos resultados de aprendizagem dos alunos. Neste estudo, foi adotada uma abordagem quantitativa na forma de um projeto quase experimental. Sessenta alunos que frequentavam aulas de contabilidade foram selecionados como amostra de pesquisa por meio de uma técnica aleatória simples. Os dados foram obtidos por meio de observações, pesquisas e testes. Os instrumentos de estudo foram fichas de observação, questionários e testes de múltipla escolha. Os dados foram analisados de forma descritiva e inferencial com o auxílio do SPSS 25. As descobertas revelaram que; 1) há um resultado de aprendizagem diferente obtido pelos alunos ensinados com a aprendizagem combinada baseada em problemas e os alunos ensinados com a aprendizagem convencional; 2) há um efeito interativo entre a aprendizagem combinada baseada em problemas e a autonomia de aprendizagem nos resultados de aprendizagem dos alunos; 3) os alunos com alta autonomia de aprendizagem ensinados pela aprendizagem combinada baseada em problemas superam os alunos ensinados pelo método convencional; 4) os alunos com baixa autonomia de aprendizagem ensinados pelo método convencional superam os alunos ensinados pela aprendizagem combinada baseada em problemas. Essas descobertas implicam a implementação da aprendizagem combinada baseada em problemas no aprimoramento dos resultados de aprendizagem dos alunos por meio da autonomia de aprendizagem.

Palavras-chave: Aprendizagem combinada, Autonomia de aprendizagem, Resultados de aprendizagem, Aprendizagem baseada em problemas.

Introduction

A great shift in the education system during covid-19 pandemic emerges a new revolution to a new normal era. The involvement of technology is continuously increased since the teachers optimize the learning interaction through the assistance of technology (Indriani et al., 2023). The stakeholders in many countries have started to determine and combine the learning method with the involvement of technology as an alternative providing students with both distant and face-to-face learning processes (Rizaldi et al., 2021). It drastically changes the learning process at all educational levels throughout a semi-virtual learning environment (Oyediran et al., 2022: Resmiaty et al., 2021). Technology becomes the bridge for conducting the learning process during the new normal era.

Blended learning is a method that emerges as a combination of virtual learning and conventional learning frequently adopted in many institutions which requires the integration of technology itself. Diana et al., (2022) state that a flexible learning experience is provided for the students through the availability of accessing the learning process both at school and home in an easy interaction. Moreover, blended learning is underlined by a student-centred approach allowing them to manage their learning process which indicates students' active involvement in conducting the learning process (Sakina et al., 2020). Many experts also prove that blended learning improves students' learning independence or autonomy since they have a space for regulating their learning process without any limitation of time and space (Mahmud, 2021). The emergence of blended learning assists teachers in conducting the learning process in the new normal era by providing a student-centered learning process through mixed virtual and traditional methods.

In addition, blended learning is frequently combined with other learning methods as an innovative teaching strategy to conduct 21st century learning. Problem-based learning is one of the strategies stimulating students' 21st century skills; collaboration, critical thinking, and creativity through the provision of authentic problems (Sipahutar, 2022). Dawilai et al., (2021) argue that problem-based learning combined with blended learning is the best practice for the students

in the digital era. It allows students to explore their knowledge through a real problem that can be solved by functioning the information gained from an abundant source accessed in offline and online environments (Zamroni et al., 2020b). Mahadi et al., (2022) add that the contribution of problem-based blended learning to students' thinking skills is reflected in their learning outcomes. It shows that the combination of these learning strategies is essential in the learning process.

The current situation shows that the implementation of problem-based blended learning is not implemented optimally in many institutions. The preliminary observation is conducted at Politeknik Negeri Bali, particularly in the accounting department. It is found that the 5th semester students who join the accounting program have low learning outcomes. The data show that their learning outcomes are lower than the outcomes during covid-19 pandemic. It is due to the new adjustment in the new normal era. The teachers state that the implementation of problem-based blended learning does not work optimally since it is also influenced by the students' internal factors. It is relevant to Orakci and Gelisli (2019) those who state that the implementation of a learning strategy is also influenced by the students' internal factors.

Students learning autonomy is one of the internal factors playing an important role in conducting the learning process itself. Students learning autonomy is an important aspect related to students' responsibility in managing their learning process (Orakci & Gelisli, 2019). It is perceived as students' internal factors significantly influencing the determination of a successful learning process (Güneş & Alagözlü, 2020). Students' learning autonomy also refers to the degree of students' abilities in controlling several factors in their learning process; time, pace, learning topic, learning strategy, and learning objective (Andina et al., 2020). Students learning autonomy is started by managing, organizing, and evaluating the learning process independently which can increase their cognitive level (Sudirtha et al., 2022; Widiartini & Sukerti, 2023).

Problem-based blended learning method has been realized and discussed by many researchers. Ismail and Edi (2022) investigated that the method could improve students' academic writing skills. It was found that students have improved

and showed a positive response to the implementation. Earlier, Nurkhin et al., (2020) discovered that the method leads students to achieve a better learning outcome in biochemistry. It is relevant to another study in which the method increases students' creative thinking during covid-19 pandemic (Koyimah et al., 2021). Those studies reveal that the method has a significant influence but no studies focus on investigating the students' learning autonomy and its relation to the implementation. Regarding the current problem, further study needs to be conducted related to problem-based blended learning, students' learning autonomy, and learning outcomes. Therefore, this study is intended investigating the effect of problem-based blended learning on students' learning outcomes through students' learning autonomy.

Theoretical Framework and Literature Review

Problem-based learning is widely defined as a learning strategy that develops students' competencies including self-directed learning and collaboration in exploring problems with their possible solutions (Konings et al., 2018). It is an instructional model providing sustainable learning through an ill-structured problem that should be solved by the learners independently (Dawilai et al., 2021). Students are allowed to interpret, identify, and create the solution and strategy to solve the problem given which increases their problem-solving skills and collaboration (Ojaleye & Awofala, 2018). The combination of problem-based learning with blended learning creates an innovative learning environment. Blended learning is expected to encourage students' activeness both in conventional and online learning exploring students' thinking skills and intellect (Marnita et al., 2020). Conventional learning promotes direct interaction between students and teachers meanwhile online learning provides students with learning activities without space and time limitations (Tadlaoui & Chekou, 2021; Susilowati et al., 2021).

The implementation of a learning strategy also depends on students' internal factors. One of the factors is students' learning autonomy. It is perceived as students'

ability to control or manage their learning process by involving themselves in planning, realizing, and evaluating the learning process itself (Reyes & Torio, 2021). Learning autonomy is not required to be constructed since it is inherent within the students and still needs to be developed (Badrinathan, 2015). Safi'i et al., (2021) argue that learning autonomy is an active encouragement presented in an intensive process to achieve the learning objectives in which it is perceived as self-empowerment at the same time. In addition, a successful implementation of a learning strategy is not only obtained from students' learning autonomy but is reflected in their learning outcomes. Learning outcome is defined as a behavioral change reflecting students' knowledge, skills, and affection as the result of a learning process commonly perceived as an academic achievement (Halim & Rahma, 2020; Puniatmaja et al., 2024).

Methodology

A quantitative approach was adopted in the current study, particularly in the form of a quasi-experimental with a 2 x 2 factorial model. Three research variables became the focus of this study; problem-based blended learning as an independent variable, students' learning autonomy as the moderator variable, and students' learning outcomes as the dependent variable. The setting was Politeknik Negeri Bali. Sixty students who took accounting majors were selected as a research sample by using a random sampling technique from the total population of 210 students. The samples were grouped into four; 1) the control group with high learning autonomy, 2) the control group with low learning autonomy, 3) the experimental group with high learning autonomy, and 4) the experimental group with low learning autonomy. The control groups were the students who taught with conventional learning meanwhile the experimental groups were given a treatment in the form of problem-based blended learning. A survey and test were conducted to collect the data which the test consisted of pre-test and post-test. Questionnaires and multiple-choice were used as research instruments. The obtained data were analyzed descriptively and inferentially with the assistance of SPSS 25. There were four

hypotheses tested, such as; 1) there were different learning outcomes between students who were taught using conventional learning and problem-based blended learning; 2) there was an interactional effect between problem-based blended learning and students' learning autonomy; 3) there were different learning outcomes between students with high learning autonomy in experimental and control groups; and 4) there were different learning outcomes between students with low learning autonomy in experimental and control group.

Results

The current study concerned the investigation related to the effect of problem-based blended learning and students' learning autonomy towards students' learning outcomes in the accounting department. The collected data were first analyzed for prerequisite tests covering normality and homogeneity tests. The normality tests showed that the significant value were 0.307 (control group) and 0.325 (experimental group). The results were higher than 0.05 indicating that the data were normally distributed. The homogeneity test also revealed that the significant value was 0.946 It was higher than the standard value of 0.05 which meant that the data were homogeneous. The data were continued to the descriptive and inferential statistical analysis. The results were elaborated as follows.

Descriptive Statistic Analysis

The descriptive statistic analysis results were done to describe the obtained data viewed from the mean, standard deviation, minimum score, and maximum score as presented in Table 1.

Table 1 – The Result of Descriptive Statistic Analysis

Groups	N	Mean	Std. Deviation	Minimum	Maximum
High Experimental	15	91.67	5.56	88.60	90.00
Low Experimental	15	75.67	7.52	76.00	79.00
High Control	15	69.67	5.49	71.00	75.00
Low Control	15	86.00	5.07	71.00	79.00
Total	60				

The data presented in Table 1 shows the descriptive statistic analysis result. The high experimental group got mean score of 91.67, std. deviation of 5.56, minimum score of 88.60, and maximum score of 90.00. Then, the low experimental group got mean score of 75.67, std. deviation of 7.52, minimum score of 76.00, and maximum score of 79.00. Next, the high control group got mean score of 69.67, std. deviation of 5.49, minimum score of 71.00, and maximum score of 75.00. Lastly, the low control group got mean score of 86.00, std. deviation of 5.07, minimum score of 71.00, and maximum score of 79.00. Thus, it can be seen that there is a difference in learning outcomes between experimental group (problem-based blended learning method) and control group (conventional method).

The Different Effects Between Problem-Based Blended Learning and Conventional Method

One-way ANOVA was examined to reveal different effects between problem-based blended learning and conventional learning. This analysis supported the descriptive statistic analysis result to answer the hypothesis related to the significant effect contributed by the learning method on students' learning outcomes. The result is presented in Table 2.

Table 2 – Different Effects Between Problem based Blended Learning (PbBL) and Conventional Method

ANOVA					
post					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	510.417	1	510.417	4.992	.029
Within Groups	5930.833	58	102.256		
Total	6441.250	59			

Table 2 shows that the significant value was 0.029, lower than 0.050. It indicated that students' learning outcomes taught by problem-based blended learning were not the same as those of students taught by the conventional method. Thus, there was a significant effect difference between students taught by problem-based blended learning and conventional methods.

Interactional Effect Between Problem-Based Blended Learning and Students' Learning Autonomy

The interactional effect between the independent variable and moderator variable was obtained to find out whether there was a relation between problem-based blended learning and students' learning autonomy as presented in Table 3.

Table 3 – Interactional Effect between Problem-Based Blended Learning and Students' Autonomy

Tests of Between-Subjects Effects						
Dependent Variable: Score						
Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	4431.250[a]	3	1477.083	41.153	.000	.688
Intercept	391233.750	1	391233.750	10900.045	.000	.995
Method	510.417	1	510.417	14.221	.000	.203
Autonomy	.417	1	.417	.012	.915	.000
Method * Autonomy	3920.417	1	3920.417	109.226	.000	.661
Error	2010.000	56	35.893			
Total	397675.000	60				
Corrected Total	6441.250	59				
a. R Squared = .688 (Adjusted R Squared = .671)						

Table 3 shows that Sig. value of the method was 0.000 indicating that the method significantly contributed to students' learning outcomes by about 20%. On the other side, Sig. value of the autonomy was 0.915 indicating that the students' learning autonomy did not significantly contribute to students' learning outcomes. Besides, Sig. value method and students' learning autonomy was 0.000 indicating that the method and students' learning autonomy significantly contributed to students' learning outcomes by about 66%. Thus, it could be seen that there was an interactional effect between problem based blended learning and students' learning autonomy towards students' learning outcomes.

The Difference in Students' Learning Outcomes Between Students with High Learning Autonomy Taught by Problem-Based Blended Learning and Students with High Learning Autonomy Taught by Conventional Method

Multiple comparisons test was conducted to find out whether there was a significant difference related to the learning outcomes gained by the students with high learning autonomy in problem-based blended learning and the students with high learning autonomy in conventional learning. The result is presented in Table 4.

Table 4 – The Multiple Comparison Result

Scheffe						
(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
High Experimental Group	High Control Group	22.000*	2.188	.000	15.69	28.31

Table 4 shows that Sig. was 0.000 which was lower than the standard value 0.050. It indicated a significant difference in the learning outcomes gained by the students with high learning autonomy in the experimental group and control group. It was supported by the previous result in descriptive statistic analysis in which the students who had high learning autonomy in the experimental group achieved a higher score of "91.67". Meanwhile, students have high learning outcomes in the control group gained a lower score of "69.67". This evidence revealed that learning autonomy and problem-based blended learning had a significant influence on students' learning outcomes.

The Difference in Students' Learning Outcomes Between Students with Low Learning Autonomy Taught by Problem-Based Blended Learning and Students with Low Learning Autonomy Taught by Conventional Method

Multiple comparison test was also conducted to find out the difference in students' learning outcomes between students with low learning autonomy in problem-based blended learning and conventional learning as presented in Table 5 as follows.

Table 5 – The Multiple Comparison

Multiple Comparisons						
Scheffe						
(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Low Control Group	Low Experimental Group	10.333*	2.188	.000	4.03	16.64

The result revealed that there was a difference between the learning outcomes gained by students with low learning autonomy taught by problem-based blended learning and students with low learning autonomy taught by conventional learning. It was shown from the Sig. Value of 0.000 which was lower than the standard value of 0.050. It was supported by the descriptive analysis result where the students with low learning autonomy in the experimental group gained a mean score of 75.67 meanwhile the students with low learning autonomy in the control group achieved a mean score of 86.00. It can be indicated that there is a significant difference between the two groups. The control group performs better since low

learning autonomy students are still directed by the teacher through the conventional method.

Discussion

A significant difference between the learning outcomes of the students who were taught with problem-based blended learning and the students who were taught with conventional learningb was revealed. It was relevant to the previous study conducted by Zamroni et al., (2020) which found that there was a difference in students' critical thinking who were taught with problem-based learning provided in blended learning with the students who were taught with conventional learning. A similar finding was also discovered in the implementation of problem-based blended learning for biochemistry students revealing that there was a significant difference between students' critical thinking skills and active involvement taught with problem-based blended learning and conventional model (Yennita & Zukmadini, 2021). It strengthened the result found by Indriani et al., (2023) showing that there was a difference in mean score gained by the students taught with problem-based blended learning and conventional learning indicating that there was a strong influence given by problem-based blended learning.

The finding revealed that there was no significant influence contributed by learning autonomy to students' learning outcomes but it had an interactional effect with problem-based blended learning. The interactional effect that occurred between problem-based blended learning and students' learning autonomy contributed to a significant influence on students' learning outcomes. It was perceived as a contradiction to the previous study which implicated that learning autonomy contributed a significant influence on students' learning outcomes (Suastra et al., 2019). The current study supported many relevant studies discussing the effect of problem-based learning and blended learning on students' learning outcomes. Adinda and Mohib (2020) revealed that blended learning enhanced students' self-directed learning through the increase in learning autonomy. Chaiyasit et al., (2023) discovered that problem-based learning implemented

through hybrid learning encouraged self-directed learning viewed from students' learning autonomy. Oppositely, another finding showed that learning autonomy significantly improves students' learning outcomes (Marantika, 2021).

Furthermore, the study recently found that problem-based blended learning and learning outcomes had a significant impact on students' learning outcomes in accounting classes. It strengthened the previous study conducted by Waluya et al., (2019) revealing that problem-based blended learning improved students' creative thinking skills reflected on their learning achievement. A similar finding was also discovered in the study conducted by Ismail and Edi (2022) in which problem-based blended learning was perceived as an effective learning method for increasing students' reading skills obtained from their learning outcomes in reading class. It is also supported the previous study which found that the combination of students' learning autonomy and blended learning contributed to a significant effect on students' learning outcomes (Güneş & Alagözlü, 2020). Therefore, the present study could be perceived as further evidence related to the essence of problem-based blended learning and students' learning autonomy in improving students' learning outcomes.

Conclusion

The present findings conclude that there are several findings related to the effect of problem-based blended learning and learning autonomy on students' learning outcomes in accounting classes. Those findings are; 1) there is a different learning outcome gained by the students taught with problem-based blended learning and the students taught with conventional learning, 2) there is an interactional effect between problem-based blended learning and learning autonomy on students' learning outcomes, 3) students with high learning autonomy taught by the problem-based blended learning outperform students taught by the conventional method, 4) students with low learning autonomy taught by the conventional method outperform students taught by problem-based blended learning. Those findings implicate the implementation of problem-based blended

learning as an innovative learning method in the new normal era which needs further investigation in more-depth analysis particularly in accounting classrooms.

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