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Collaborative Project Based Blended Learning on Resilience and Student Learning Outcomes

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ABSTRAK

Perubahan proses pembelajaran akibat Covid-19 mempengaruhi hasil belajar dan kondisi kesehatan mental siswa. Masalah yang menjadi dasar dilaksanakannya penelitian ini adalah belum efektifnya pembelajaran yang dilakukan pada masa pandemi covid-19 sehingga pemulihan pendidikan dalam bentuk pemulihan resilience *dan hasil belajarnya penting untuk dilakukan. Tujuan penelitian ini adalah 1) menganalisis perbedaan secara signifikan* resilience *dan hasil belajar bahasa Inggris secara bersama-sama antara siswa yang belajar dengan* collaborative project based blended learning *dengan* direct blended learning, *2) menganalisis perbedaan* resilience *antara siswa yang belajar dengan* collaborative project based blended learning *dengan* direct blended learning, *3) menganalisis perbedaan hasil belajar antara siswa yang belajar dengan* collaborative project based blended learning *dengan* direct blended learning. *Penelitian ini merupakan penelitian eksperimen semu dengan rancangan* posttest only control group design. *Populasi penelitian ini adalah sebelas kelas IX SMP. Data* posttest resilience *dikumpulkan dengan kuesioner dan data* posttest *hasil belajar dikumpulkan melalui tes pilihan ganda. Data dianalisis secara deskriptif dan dianalisi menggunakan* multivariate analysis of variance *dengan taraf signifikansi 5%. Hasil penelitian menunjukkan bahwa terdapat perbedaan* resilience *dan hasil belajar bahasa Inggris antara dengan hasil yang lebih baik pada siswa yang belajar dengan model* collaborative project based blended learning. *Berdasarkan hasil penelitian, model* collaborative project based blended learning *dapat digunakan secara efektif untuk meningkatkan ketahanan mental dan hasil belajar siswa.*

ABSTRACT

The COVID-19 pandemic is indirectly causing rapid and dramatic changes in the learning process, one of which is the need to hold lectures online with subsequent implications for student wellbeing. The main problem of conducting this research is the ineffectiveness of the learning process during the Covid-19 pandemic so that to restore their resilience and learning outcomes was an important things to be focused on. The aims of this study were 1) to analyze the significant differences in resilience and the English learning outcomes simultaneously between students who studied collaborative project based blended learning with direct blended learning, 2) to analyze differences in resilience between students who studied collaborative project based blended learning with direct blended learning, 3) analyzing differences in the learning outcomes between students who learn with collaborative project based blended learning and direct blended learning. This research is a quasi-experimental study with posttest only control group design. The population of this study was eleven class from grade IX of Junior high school. Resilience data was collected by questionnaire, learning outcomes data was collected by multiple choice tests. Data were analyzed descriptively and analyzed by using multivariate analysis of variance at a significance level of 5%. The results showed, there were differences in resilience and English learning outcomes with better results for students who studied with the collaborative project based blended learning model. Based on this, collaborative project based blended learning model can be effectively used to improve resilience and learning outcomes of student in junior high school.

1. INTRODUCTION

The focus of the Indonesian government on education after facing Covid-19 pandemic is to restore education at all levels. Efforts have been made to change the curriculum and improve the learning process (Ariga, 2022; Nugraha et al., 2022; Nur Asiyah et al., 2020). It is expected that Indonesia's learning process will soon recover, resulting in optimal quality of Indonesian human resources and a strong ability to compete with other countries. However, there are still some learning issues in Indonesia, including in English. Several studies have found that online learning during the pandemic outbreak leads to boredom, diminishes the interest in learning and triggers anxiety (Fania et al., 2021; Pawicara & Conilie, 2020). Moreover, student wellbeing is heavily impacted (Lindasari et al., 2021; Versteeg & Kappe, 2021).

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To overcome the problems, it is currently important to make changes to the learning process to place students as active learners. Innovative learning is needed to stimulate student motivation to learn. Teachers are required to be more creative in utilizing everything that can be used to stimulate thoughts, feelings, attention and abilities (Randazzo et al., 2021; Yanti & Fernandes, 2021). Resilience is a highly-favored method of promoting student wellbeing since it successfully aid students in coping with stress and mental health issues efficiently. It is suggested that resilience is essential to adaptive healing. Moreover, it is stated that resilience is an individual's ability to adapt to problems, survive, overcome stress and thrive in the midst of life's difficulties (Connor & Davidson, 2003; Rusch et al., 2021).

Social interaction is crucial in the development of knowledge. According to previous study higher mental functions typically develop during interpersonal interaction or cooperation (Sugrah, 2019). Social interaction can stimulate cognitive development of students in the Zone of Proximal Development (ZPD) to maximize learning outcomes. Therefore, it is very important for teachers to design and create learning experiences to facilitate ZPD students in the classroom. Departing from this theory, the initial solution for learning recovery can be done through increasing student resilience, and developing student knowledge through a process of social interaction. Moreover, by focusing on learning recovery, the learning process must be combined with appropriate learning strategies in accordance with the characteristics of lessons. The role of educational technology in this part is in the design areas and utilization areas, including the efforts to select and use appropriate strategies in learning (Cortázar et al., 2021; Mursid et al., 2022).

The online learning designs consisting of formulating learning outcomes, mapping material, creating asynchronous learning flows combined with project-based learning syntax with LMS integration used in appropriate learning activities can make a meaningful learning (Lasamahu et al., 2021; Widiyono, 2021). Therefore, the collaborative project based integrated as content blended learning became a collaborative project based blended learning allowing students to learn by working on their projects, either physically present in class or not. This strategy is expected to make the most of technology in enhancing the learning process and motivate students to work on learning-related projects to boost their resilience and learning outcomes.

Based on observations, student learning outcomes remained low at SMP Negeri 2 Amlapura, where this research was conducted. In class, students appear drowsy, uninterested, and passive. According to the personal interviews report, learning from home makes it difficult for them to understand the lesson, it is also difficult for them to focus on their studies, and they desperately want to see their friends. This indicated that students did not yet have the resilience skills to deal with difficulties, particularly after the pandemic, because students still appeared anxious, nervous, and bored, and building an interaction with other friends was hard. Furthermore, the monotonous and boring learning environment is caused by the lack of implementation of learning models that accommodate students' learning needs. Teachers mostly used a direct learning model in the classroom. As a result, 70% of 11 classes consisting of 377 students could not achieve the minimum standard of competence criteria in their mid semester tests in English lessons which were held in the 2nd semester.

Previous research on overcoming difficulties during the learning recovery period has been conducted, including research by previous study which showed that communication, problem-solving skills, emotional intelligence, mental health and well-being are key characteristics of high-achieving students (Gamble & Crouse, 2020). The previous research only described the resilience and learning outcomes in different contexts (Oktawirawan, 2020; Oliveira et al., 2021). Therefore the researcher interested to find out more about the significant differences in resilience and student learning outcomes between collaborative project-based blended learning and direct blended learning. Furthermore, the purpose of this study is to analyze more about the differences in student resilience between the models of collaborative project-based blended learning and direct blended learning, as well as the differences in student English learning outcomes between students who follow the model of collaborative project-based blended learning and students who follow the model of direct blended learning.

2. METHOD

This research is a quasi-experimental with non-equivalent post-test only control group design (Rogers & Revesz, 2019). The research population consisted of 11 classes from grade IX of SMP Negeri 2 Amlapura for the 2022/2023 academic year. Two classes were selected as samples by group random sampling technique. An equivalence test was carried out on two sample groups, then divided into experimental and control groups. IX 5 is chosen as the experimental class and is taught using a collaborative project-based blended learning model, whereas IX 4 is taught using a direct blended learning model. There are 68 samples in total.

Data collection was carried out by means of a resilience questionnaire and English test through google forms and tests. The data is in the form of student resilience scores and student learning outcomes scores. The resilience questionnaire consists of 30 statements and the learning test consists of 25 multiple choice questions. The parameters for each instrument are listed in Table 1.

Table 1. The Parameters of Each Instrument

Questionnaire	Aspect
Resilience (Reivich & Shatte, 2002)	Emotion regulation Impuls control Optimisme Causal analysis Empathy Efication Reaching out
Test	**Aspect**
Learning Outcomes	**Indicators of basic competency in narrative text material**

Content validity for English learning outcomes in the form of tests in English narrative material, is created according to the basic competencies, indicators, and test items which are outlined in the form of a blueprint. Theoretical validation is determined by expert judges. Test results were then tested empirically by testing its validity of the items including the analysis of its level of difficulty, discrimination power and effectiveness of the distractor. The reliability test was analyzed with the Kuder Richardson 20 formula.

Moreover, content validity of the resilience questionnaire in accordance with the indicators of resilience and statements are poured into a blueprint. The 30 statements that have gone through a theoretical validation test were then tested on 30 students as respondents. The results of the questionnaire in the form of student resilience score data were then tested empirically including item validity tests with the product moment correlation formula and reliability tests using Crohnbach's alpha. The test results were then analyzed to test the hypothesis.

Sequentially, data analysis was carried out on data description, assumption test, and hypothesis test. Assumption tests include: normality test, variance homogeneity test and multicollinearity test. The normality test for data distribution in this study used the Shapiro-Wilks test. The homogeneity test of variance aims to determine whether the variance is homogeneous or not and is intended to determine differences in hypothesis testing as a result of differences between groups, not as a result of individual differences within groups. Test the homogeneity of variance using the Levene test, homogeneity test of the covariance variant matrices using Boxs'M values and the multicollinearity test is guided by the value variance inflation factor (VIF) or tolerance(tolerance). Furthermore, the data were analyzed descriptively and analyzed using Manova. All hypothesis testing was carried out at the 5% significance level.

3. RESULT AND DISCUSSION

Result

The descriptive qualification of resilience and learning outcomes in terms of their ideal mean and deviation standard were generated refer to five scale rating conversion guidelines, as follows in Table 2 and Table 3.

Tabel 2. Student's Resilience Category

No.	Score	Quality
1	$\bar{X} \geq 97.5$	Very Good
2	$82.5 \leq \bar{X} < 97.5$	Good
3	$67.5 \leq \bar{X} < 82.5$	Fair
4	$52.5 \leq \bar{X} < 67.5$	Poor
5	$\bar{X} < 52.5$	Really Poor

Tabel 3. Student's Learning Outcomes Category

No.	Score	Quality
1	$\bar{X} \geq 74.9$	Very Good
2	$58.3 \leq \bar{X} < 74.9$	Good
3	$41.7 \leq \bar{X} < 58.3$	Fair
4	$25.9 \leq \bar{X} < 41.7$	Poor
5	$\bar{X} < 25.9$	Really Poor

Based on the results of descriptive analysis as show in Table 2 and Table 3 the resilience data of students following the collaborative project based blended learning model has an average score of 87.26 and a standard deviation of 7.05. Referring to the resilience classification criteria, it is classified as the good category. The resilience data of students following the direct blended learning model has an average score of 82.68 and a standard deviation of 6.59. Referring to the resilience classification criteria, it is also classified as the good category. Based on the description of student resilience presented above, it can be seen that the achievement of student resilience scores in the group that studied with the collaborative project based blended learning model was higher than the direct blended learning model.

Besides, the result of the English test following the collaborative project based blended learning model has an average score of 85.18 and a standard deviation of 6.71. Referring to the criteria for English learning outcomes, it is classified as a very good category. Data on the results of learning English following the direct blended learning model have an average score of 79.18 and a standard deviation of 7.55 also classified as a very good category. Recapitulation of posttest resilience results and students' English learning outcomes is summarized in Table 4, Figure 1, and Figure 2.

Table 4. Recapitulation of Posttest Resilience and Student Learning Outcomes

Statistics	Resilience		Learning outcomes	
	COPBL	DBL	COPBL	DBL
Mean	87.26	82.68	85.18	79.18
Median	86.00	82.50	84	80
Variance	49.716	43.438	45.119	56.998
Standard Deviation	7.051	6.591	6.717	7.550
Shoes Max.	106	98	96	92
Shoes Min.	77	70	72	64
Reach	29	28	24	28

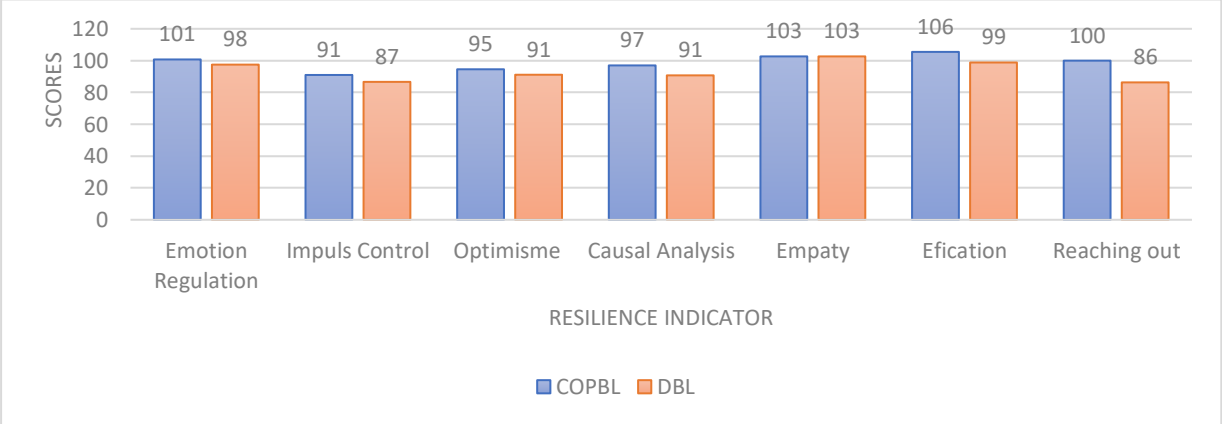

Figure 1. Achievement of Average Scores for Each Resilience Indicator of Students

Figure 2. Result of Student Learning Outcomes

The collaborative project-based blended learning model appears to achieve higher resilience scores and student learning outcomes than the direct blended learning model. The assumption test was run with a 5% significance level. The Shapiro-Wilks test results on resilience data and learning outcomes in both models have a significant score greater than 0.05. In conclusion the data is normally distributed.

Furthermore, the Box's M price was used in the results of the covariant variant matrix's homogeneity test. The Box's M value is 0.635, with a significance of 0.893. It demonstrates that the variance between learning models is homogeneous across all units of analysis. The collinearity test shows a tolerance value > 0.10 and a VIF value < 10. In conclusion, there are no signs of collinearity in the regression model. Test of normality showed in Table 5. Test of homogenity showed in Table 6. Test of Box'M showed in Table 7. Test of Linearity showed in Table 8.

Table 5. Test of Normality

Source		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Posttest Resilience	COPBL	0.101	34	0.200*	0.952	34	0.141
	DBL	0.126	34	0.186	0.965	34	0.345
Posttest Learning outcomes	COPBL	0.136	34	0.111	0.947	34	0.103
	DBL	0.161	34	0.025	0.950	34	0.126

Table 6. Test of Homogenity

Source		Levene Statistic	df1	df2	Sig.
Resilience	Based on Mean	0.521	1	66	0.473
	Based on Median	0.373	1	66	0.543
	Based on Median and with adjusted df	0.373	1	65.962	0.543
	Based on trimmed Mean	0.459	1	66	0.500
Learning Outcomes	Based on Mean	0.224	1	66	0.637
	Based on Median	0.106	1	66	0.745
	Based on Median and with adjusted df	0.106	1	63.974	0.745
	Based on trimmed Mean	0.188	1	66	0.666

Tabel 7. Test of Homogenity Matrix Variance Covarian (Boxs'M)

Statistics	Value
Box's M	0.635
F	0.205
df1	3
df2	784080.000
Sig.	0.893

Tabel 8. Test of Colinierity

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	65.812	9.129		7.209	0.000
	Learning outcomes	0.233	0.111	0.251	2.108	0.039

Assumption tests in the form of normality tests, variance homogeneity tests, and multicollinearity tests have been fulfilled, thus hypothesis testing with Manova can be carried out. The results of multivariate testing in this study are presented in Table 9.

Table 9. Multivariate Test Results

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	0.996	8419.991[b]	2.000	65.000	0.000	0.996
	Wilks' Lambda	0.004	8419.991[b]	2.000	65.000	0.000	0.996
	Hotelling's Trace	259.077	8419.991[b]	2.000	65.000	0.000	0.996
	Roy's Largest Root	259.077	8419.991[b]	2.000	65.000	0.000	0.996

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Learning Models	Pillai's Trace	0.207	8.508[b]	2.000	65.000	0.001	0.207
	Wilks' Lambda	0.793	8.508[b]	2.000	65.000	0.001	0.207
	Hotelling's Trace	0.262	8.508[b]	2.000	65.000	0.001	0.207
	Roy's Largest Root	0.262	8.508[b]	2.000	65.000	0.001	0.207

According to Table 9, the Pillai's Trace, Wilks' Lambda, Hotelling's Trace, and Roy's Largest Root statistics all have a significance level of 0.001. These results show that the learning model simultaneously has a significant effect on resilience and students' English learning outcomes. The findings also show that the collaborative project-based blended learning model has a significant effect on students' resilience and English learning outcomes simultaneously. To answer the hypothesis, multivariate analysis of variance tests in between-subjects effects are used, as shown in Table 10.

Table 10. Tests of Between-Subjects Effects

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	Resilience	357.882[a]	1	357.882	7.684	0.007	0.104
	Learning outcomes	612.000[b]	1	612.000	11.986	0.001	0.154
Intercept	Resilience	490960.059	1	490960.059	10540.906	0.000	0.994
	Learning outcomes	459202.118	1	459202.118	8993.590	0.000	0.993
Learning models	Resilience	357.882	1	357.882	7.684	0.007	0.104
	Learning outcomes	612.000	1	612.000	11.986	0.001	0.154
Error	Resilience	3074.059	66	46.577			
	Learning outcomes	3369.882	66	51.059			
Total	Resilience	494392.000	68				
	Learning outcomes	463184.000	68				
Corrected Total	Resilience	3431.941	67				
	Learning outcomes	3981.882	67				

The first hypothesis as seen in Table 10 shows that the F value between learning models for resilience and student learning outcomes is obtained F_{count} = 8.508 with F_{table} at a significant level of 0.05 is 4.130. It turns out that $F_{count} > F_{table}$ (8.508 > 4.130) with a significance value of 0.001 at a significance level of 0.05. This means, there is a significant difference between resilience and student learning outcomes in English simultaneously between students who study with collaborative project based blended learning with direct blended learning. The second hypothesis is answered by the value of F between learning models on student resilience obtained F_{count} = 7.603 with F_{table} at a significant level of 0.05 of 4.130 with a significance value of 0.007 at a significance level of 0.05. According to these findings, there is a significant difference in student resilience between students studying collaborative project-based blended learning and students studying direct blended learning. The F value between learning models on students' English learning outcomes answers the third hypothesis. F_{count} = 11.986 with F_{table} = 4.130 at a significant level of 0.05 was obtained. $F_{count} > F_{table}$ (11.986 > 4.130) with a significance value of 0.001 at a significance level of 0.05. According to these findings, there are significant differences in student learning outcomes between students studying collaborative project-based blended learning and students studying direct blended learning.

Discussion

The similar study of collaborative project based blended learning to resilience and student learning outcome has never been found before, so it provides innovation and novelty values. However, some research that is consistent with the findings of this study has been conducted. As an example previous study found that project-based learning can increase student motivation and learning outcomes better than conventional learning (Andriyani

& Anam, 2022). The same results were also obtained by other study with the finding that students in the experimental class who applied project-based learning had better collaboration skills than students in the control class who applied conventional learning (Rasyid & Khoirunnisa, 2021). In addition, other study finding that project-based collaborative learning online can maximize the learning process (Alibraheim & El-Sayed, 2021). This learning provides opportunities for students to be able to collaborate so that the interaction process that occurs during the learning process can increase their resilience in facing difficulties while also increasing their learning outcomes.

Students can deal with greater differences and complexity of opinions in collaborative setting. Through discussions during project work, students practice their emotional regulation to deal with any challenges that arise during their interaction. The same results were also obtained by previous study state students identify three types of interaction to be necessary during the implementation phase of collaboration in order to reach knowledge convergence: cognitive, social and organizational interaction (Gonzalez-sanmamed & Hernández-sellés, 2020). In line with the findings state students develop their resilience in a positive direction through collaborative project-based blended learning (Rahayu & Fauzi, 2020).

Furthermore, both models in this study are applied in direct synchronous and asynchronous mode. The syntax and the setting of learning process in collaborative project based blended learning model. The contribution of blended learning mode in this study is as follows. In both models' synchronous modes, students read, listen, see, watch videos/films, pictures/diagrams, and demonstrate individually and in groups. This stage is completed in accordance with the resilience dimensions (Cassidy, 2016; Singhal & Rastogi, 2018). Students develop the ability to adapt themselves to learn independently, students also develop their perseverance which characterized by hard work, never giving up, sticking to plans and goals, being able to receive and utilize feedback, being able to imagine imaginative problem solving and being able to use difficulties as motivation and opportunities to face challenges.

In the collaborative asynchronous mode, students dig up information from any resources and literature to find solutions on the problems that are given so they can complete their projects. During these activities, emotional regulation and problem solving are trained. By working collaboratively, students begin to analyze, decide and carry out things that stimulate their ability to survive in any difficulties that occur. In addition, students start to develop their reflective and adaptive help seeking dimension of resilience by putting them in a collaborative project environment that requires them to interact with others in order to achieve goals. These two dimensions were developed through collaborative activity within and outside their group work.

As a result, acceptance of the proposed hypothesis and the presence of additional descriptive data undoubtedly support previous studies. In line with the findings, according to previous study students' collaboration skills is affected by the project-based learning model (Rasyid & Khoirunnisa, 2021). Similar findings were also obtained by other study state that there was an increase in student learning outcomes through project based learning (Maros et al., 2021). This finding is also in line with the results obtained state that student learning outcomes in collaborative classes are higher than individual learning experiences (Timonen & Ruokamo, 2021).

Some issues related to resilience and student learning outcomes were discovered in this study. One of them is not all students can achieve very high levels of resilience and student learning outcomes using the collaborative project-based blended learning model. Besides, students do not fully comprehend the steps of learning activities they should perform, it happened because they are accustomed to study with direct learning model. Furthermore, some internal factors influence student resilience in terms of cognitive capacity, personality, and physical health (Laird et al., 2019; Versteeg & Kappe, 2021). Students' unequal mental development makes it difficult for them to cope with conflicts that arise within their group while completing their projects. This has an impact on their uneven resilience and learning outcomes.

Based on the discussion above, this study is expected to support related parties, such as policymakers, practitioners, and even students, in enhancing their English learning outcomes and academic resilience, one of which is through collaborative project-based blended learning. The findings of this study will make a substantial contribution to empirical studies of innovative learning and academic resilience. It also exists to serve as a resource/guideline for future researchers who will investigate the same variables.

4. CONCLUSION

Based on research results, there is a significant difference with better outcomes in terms of resilience and academic performance among students who follow collaborative project-based blended learning. Teacher can implement this model in the classroom to achieve higher resilience and learning outcomes because it trains students' social skills to empower their resilience aspects. In addition, through collaborative projects assisted by digital learning enriched with various learning resources, they improve their learning outcomes. However, some demanding situations are still predictive of the future, especially in relation to other factors that affect resilience and learning outcomes. It is therefore hoped that further research may reveal many other factors or variables that influence the development of resilience and student learning outcomes.

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