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DO SELF-REGULATED LEARNING AND FLIPPED LEARNING ASSISTED BY LEARNING VIDEO AFFECT LEARNING OUTCOMES? (INDONESIAN)

Abstract. This study aims to determine how the influence of Self Regulated learning and Flipped Learning with the help of video learning simultaneously or partially can affect learning outcomes and to find the indicators of Self Regulated Learning that most contribute to learning that is carried out with the help of learning videos within the scope of this model. This research is a type of quantitative research with a total sample of 84 students from the 2021 class of the 2021/2022 even semester. The research used questionnaires and written tests as research tools. The data analysis technique uses multiple regression with the term Dummy Regression using gretl. It is called dummy regression because one of the variables is Flipped Learning as a dummy variable. Based on the results of the study, it was found that Flipped Learning and Self-Regulated Learning simultaneously had a significant and positive effect on learning outcomes, partially Flipped Learning had an effect on learning outcomes while Partial Self-Regulated Learning had no significant effect on learning outcomes. The Revisit indicator was found to be one of the most contributing indicators in flipped learning-assisted learning on learning outcomes. In this study, it resulted in implications through a finding that was different from previous research, partially SRL did not significantly affect student learning outcomes. This is possible because students' SRL is not enough to understand students in a learning material. It takes modifications to the environment outside of the student to optimize the student's SRL in learning activities, one of which is the use of learning videos in flipped *learning.*

Keywords: self-regulated learning; flipped learning; tutorial video; learning outcomes.

INTRODUCTION

Digital world development provides new innovation in learning process which help students to obtain learning resources effectively. This phenomenon shift learning paradigm from conventional approach to Flipped Learning approach. Generally, Flipped learning is part of blended learning where students are required to be able to learn independently outside the classroom (Cheng et al., 2019; Jansen et al., 2020; Lee et al., 2017) . flipped learning approach is an innovative and effective approach (Hwang et al., 2015) . Flipped learning concept was originally based on video utilization as a content transfer medium (Gaspari\vc, 2017). Flipped learning has been interpreted in a variety of ways, including video-based instruction and classroom workshops (McCabe, 2018) .

Flipped Learning is part of blended learning with students are asked to watch online lectures before class and activities are continued in classroom to interact with peers and instructors (Lee et al., 2017) . This learning approach is implemented by several steps, including: 1) educators prepare videos or other material types; 2) educators explain new concepts that students will learn; 3) students learn this concept by watching learning video independently; 4) discuss their finding or ideas in classroom (Halili & Zainuddin, 2015; Lo & Hew, 2017) . Flipped Learning is supported by social constructivist learning theory, which argues that effective learning requires students to build their own understanding of the subject matter. It generally characterized by student-centered, problem-based, discovery or experiential learning (Lindeiner- Straský et al., 2020) . This learning succeed requires teachers and students to understand their roles during learning process. This concept is designed to test and practice what they have learned previously. Learner is act as an active constructor of information. In flipped learning, the most essential component is active learning (Muzyka & Luker, 2016) . It requires learner to be independent and possess metacognitive skills to know how to learn effectively (Halili & Zainuddin, 2015; Lo & Hew, 2017; Long et al., 2017; Sergis et al., 2018) . Based on this theory, flipped learning approach is applied by utilizing technological developments in implementing student self-learning, using digital resources and bringing new concepts that can be discussed in class with peers and educators.

Flipped learning approach can be beneficial if students have adequate Self-Regulated Learning (SRL) skill (He et al., 2016; Shih & Huang, 2020). SRL has an essential role in the successful implementation of flipped learning. Students who possess SRL skill will be able to learn independently and achieve their learning goals without teacher supervise. Thus, Self-Regulated Learning plays an important role in student learning achievement (Bradley et al., 2017) and has a positive effect (Latipah, 2015) where the purpose of continuity learning for educators is to teach students to become independent learners (Patricia Aguilera-Hermida, 2020). Research showed that supporting students' SRL is an effective strategy to improve students' SRL skill and learning outcomes in primary education (Hwang et al., 2015) , high school (Ramadhani et al., 2019) and higher education (Moos & Bonde, 2016) .

Research on Self-Regulated Learning (SRL) was conducted by Zimmerman in 1986 and continued to be developed by subsequent researchers (Panadero, 2017) . Self-regulated learning is an active learning behavior that contributes to achieve learning

objectives. Students aware to their learning environment, find themselves strategies and activities that support their regulation. Thus, they will be able to overcome learning anxiety and reach academic achievement (Delen & Liew, 2016; Ekici et al., 2014; Landrum, 2020; Lock et al. al., 2017) . Self-regulated learning includes five aspects, namely: cognitive, metacognitive, behavioral, motivational, and emotional/affective learning (Panadero, 2017) . These aspects indicate the suitability between Self-Regulated Learning and Flipped Learning. Flipped learning implementation support students' SRL through explicit instruction in learning video. In further research, five SRL indicators were identified (Completion..rate indicated , Watch.time, On time.rate, Rewind.actions , revisit action) on the flipped learning implementation assisted with learning video although it has not been determined which indicator has the most influence (van Alten et al., 2021). Self-Regulated learning consists of several aspects, such as: cognitive, metacognitive, behavioral, motivational, and emotional/affective learning (Panadero, 2017) . Self-Regulated Learning is an active constructive process to determine learning goals (Mustofa et al., 2019) and a comprehensive flipped learning which can be applied at various levels of education (Rahman et al., 2019) .

However, at the university level, it was found that students have difficulty adapting to flipped learning and insufficient independent learning skills (Antonova & Merenkov, 2018) . Not all students have the ability to self-regulate which is needed in learning process (Tichavsky et al., 2015) . The result conducted by (van Alten et al., 2020) explain that flipped learning supports students' SRL skill through explicit instructions in learning video leads students to improve their learning outcomes. However, it cannot be explained directly which indicators of SLR skills plays main contribution of it. Further research found five SRL indicators (Completion rate indicated, Watch time, On time rate, Rewind actions, and revisit action) on the use of flipped learning learning videos that have not been determined clearly which indicators have the most influence and become suggestions for the next researchers to solve it (van Alten et al., 2021) .

Based on the previous explanation, this research aims to fullfil the gap by finding out SRL indicators that dominantly affect student learning outcomes which is not answered by previous researach. It also becomes our research novelty. In addition, this research aims to explain the effect of flipped learning method implementation and the role of SRL on learning outcomes.

This research novelty is based on the previous research gap which state that flipped learning can create innovative and effective learning, improve student learning outcomes and applicable at various levels of education (Hwang et al., 2015; Moos & Bonde, 2016; Ramadhani et al. al., 2019) . In fact, at the tertiary level, flipped learning implementation raise some obstacles where students with low SRL skill have difficulty to learn independently and adapting to such learning (Antonova & Merenkov, 2018; Tichavsky et al., 2015) . In this current research, researchers implement flipped learning with assisted by learning video to support students' SRL skill and increase learning outcomes. This study also explore the indicators of Self Regulating Learning (SLR) which dominantly influence students' learning outcomes. It will be novelty to answer previous studies gap that have described the SRL indicators but have not found the most dominant indicator.

This study aims to clarify the effect of self-regulated learning and Flipped Learning assisted by learning video on learning outcomes simultaneously or partially and deteremine the main indicators of Self Regulated Learning that most contribute to learning process.

RESEARCH METHODOLOGY

This research is a quantitative research as an empirical study to collect, analyze, and display data in numerical rather than narrative form. It is expected to explain the effect of Self Regulated Learning, Flipped Learning on Students' Learning Outcomes. Studen participate in this study tobe a population who took the Macroeconomic Theory course. The research samples were taken using the non-probability sampling method with saturated sampling technique so that the total number of students was 84 students. Dependent variables in this study are Self-Regulated Learning (X) and Flipped Learning (D). Independent variable is Student Learning Outcomes. This instruments consist of pretest and posttest which is used to determine student learning outcomes before and after treatment. The pretest was carried out before the students were given treatment. The posttest was carried out after the students were given treatment. Pretest and posttest consist of five essay questions. Learning outcome is measured through these instruments score intervals of 0-100. Questionnaire instument is intended for students to find out the indicators of SRL variable on students after getting treatment. This study used a closed questionnaire with answers choices provided by the researchers. Alternative answers use Interval and Ratio scales. Data analysis technique used Dummy Regression with gretl software assistance to test whether there is an effect of SRL on student learning outcomes in flipped learning or not. SRL (X) and Flipped Learning (D) as independent variables (X) and student learning outcomes as the dependent variable (Y).

Study of the problem and its assessment

This study to prove whether the variables Self Regulated Learning (SLR) and Flipped Learning (D) as independent variables (X) have an influence on student learning outcomes as the dependent variable (Y). Furthermore, this study purposes to determine which indicators in Self Regulated Learning (SLR) have the most important contribution.

The output results of the Summary Model are used to present the relationship between two or more variables in the regression equation.

Table 1: *Model Summary*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.352 [a]	-124	.103	3.643178474

a. Predictors: (Constant), D-Flipped, SRL

The R-Square value in the table shows a value of 0.124 or 12.4%. This value means that the influence of Self Regulated Learning (SLR) and Flipped Learning (D) as an independent variable (X) has an influence on student learning outcomes as the dependent variable (Y) of 12.4%, the remaining 87.6% is influenced by other variables outside the model. The terms of the relationship between variables are good or not if the

R-Square value cannot be said. In social research, most of the objectives are not to predict the value of the dependent variable, but to see the significance of the effect of the independent variable on the dependent variable. Therefore, even though the R2 value is only 20%, if it is statistically significant (F test), the model is still considered good.

The F test was used to determine the effect of the independent variable on learning outcomes simultaneously or simultaneously.

Table 2: **F . test**

	Model	Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	154.022	2	77.011	5.802	.004 [b]
	Residual	1088.365	82	13,273		
	Total	1242,388	84			

a. Dependent Variable: Learning Outcomes
b. Predictors: (Constant), D-Flipped, SRL

Based on the results of the ANOVA test on table 2, it can be found that the significance value is 0.004, it is smaller than alpha level (0.05). Therefore, it can be concluded that there is an effect of Self Regulated Learning (SLR) and Flipped Learning (D) as independent variables on student learning outcomes as the dependent variable (Y) simoustanously. T-test was conducted to determine the effect of each independent variable (Self-Regulated Learning (SLR) and Flipped Learning) on the dependent variable (learning outcomes). If the results of the T test have a significance value of < 0.050 and the value of T count $>$ T table, it means that the independent variable partially has a significant effect on the dependent variable.

Table 3: **T . test**

	Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	80.701	.667		121.017	.000
	SRL	-.084	.136	-.064	-.619	.538
	D-Flipped	2.816	.830	.352	3.392	.001

a. Dependent Variable: Learning Outcomes

In the table above can be explained, among others:

Self-Regulated Learning variable has at value of -.619 < t table with a Sig. value of 0.538 > 0.005. it can be concluded that the variable Self-Regulated Learning has no significant effect on the variable student learning outcomes and the effect is negative.

The flipped learning variable has a t-count value of 3.392 > t-table with a Sig value. of 0.001 < 0.005. It can be concluded that the flipped learning variable has a significant effect on the variable student' learning outcomes and the effect is positive.

To find out which SLR indicator has the most important contribution, standardized regression analysis is carried out with the following equation:

  Y = 1 X 1.1 + 2 X 1.2 + 1 X 1.3 + 1 X 1.4 + 1 X 1.5 + e

T-test is conducted to determine the indicators of the Self-Regulated Learning variable that has the most contribution in flipped learning.

Table 4: *Contribution Test*

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	82,301	2.401		34,280	.000
	Completion Rate	-.001	.031	-.005	-.041	.968
	Watch time (min)	.003	.075	.005	.039	.969
	On time rate	.126	.722	.020	.174	.862
	Rewind	.954	.577	.193	1,653	.102
	Revisit	-.904	.520	-.201	-1,738	.086

a. Dependent Variable: VALUE

To determine the most contributing indicator is based on the level of significance from the T-test with Sig. value is 0.1. An indicator is categorized as the most contributing indicator if the Sig. value is < 0.1. Data on the table 4. explain that revisit indicator has Sig. value < 0.1. Therefore, it can be concluded that the Revisit indicator is the most contributing indicator.

The Effect of Self-Regulated Learning on Learning Outcomes
The results showed a negative and insignificant relationship between Self-Regulated Learning on student learning outcomes. This findings contradict with previous studies which state that Self-Regulated Learning is able to have a positive and significant effect on student learning outcomes (Ariyanti & Dahlan, 2019; Cho et al., 2017; Latipah, 2015; Van Laer & Elen, 2019) . Self-regulated learning is influenced by students' personal factors (cognitive, attitude, and self-evaluation), behavior, and the environment (social support) (Zakiah & Fajriadi, 2020). Personal factors are not adequate to drive students reach learning achievement. Sometimes, social problems cause students' failure to achieve success (Lisdawati et al., 2018; Ramli et al., 2018) .

Students with SRL skills can positively influence learning outcomes. However, this finding cannot be explained because of the students' SRL skill differentiation. It require other combinations from outside personal factor to increase student learning outcomes (Ranellucci et al., 2021) . Each student has various prior abilities and it is important to mastery basic concept of Macroeconomics. Students' prior knowledge will influence student outcomes in learning activities (Prakoso et al., 2020; Suryawati & Hasriani, 2019; Villarreal et al., 2016) .

The Effect of Flipped Learning on Learning Outcomes
The data analysis show that Flipped Learning has a significant effect on student learning outcomes and the effect is positive. Each addition to the Flipped Learning method has a positive impact on improving student learning outcomes. These results are in line with previous research which showed that there were significant differences in student learning outcomes between classes that used flipped learning and those that did

not use flipped learning. (Yousefzadeh, 2015) . This learning has a positive impact on student learning outcomes and student engagement in learning (Paryani & Ramadan-Jradi, 2019) . Flipped learning is very effective to implement in Learning Management Systems (LMS) both in online learning and blended learning. Learning process can be modified and able to improve students' abilities to mastery learning materials (Staddon, 2022; Wang, 2021) .

Flipped learning method applied by using learning videos is able to motivate students to prepare themselves receive learning materials that will be discussed in class. Students who watch instructional videos before the learning session begins have better performance than other students who do not (Förster et al., 2022) . Flipped Learning by using learning videos at the beginning of learning activities is able to change students' emotions which affect learning behavior and academic achievement (Ranellucci et al., 2021)

Self-Regulated Learning and Flipped Learning on Learning Outcomes

Self-Regulated Learning and Flipped Learning was found to have a significant and positive effect on Learning Outcomes. However, partially SLR has no significant effect on learning outcome. Self-regulated learning needs to be combined with the implementation of Flipped Learning as an external factor in learning activities, especially with learning video assistance. This finding is consistent with previous studies that revealed that self-regulated learning needs to be accompanied by the application of Flipped Learning with the help of learning videos before learning activities begin (van Alten et al., 2020).

Students who possess SRL skill are able to have a positive effect on learning outcomes. Nevertheless, this result can not be explained further because of the differences students' SRL skill. Self-regulated learning needs to be combined by modified flipped learning with learning video (Ranellucci et al., 2021; van Alten et al., 2020) .

The Most Contributing Self-Regulated Learning Indicators

Previous research found that SLR can positively affect learning outcomes, however the results cannot determine the most contributing indicators which influence students'learning outcomes (van Alten et al., 2021) . In this recent study, the researchers tried to analyze Self Regulated Learning indicators in the flipped learning approach with learning videos assistance. It was found that the indicator that had the greatest contribution was the Revisit indicator.

Revisit refers to review action where students are rewatching learning video on the other day (van Alten et al., 2020) . It indicates that students aware to review learning material with a high frequency before and during learning process. This action indicates that students have high self-motivation to mastery learning material and become an active participant in learning activities. Student' awareness to be an independent learner becomes a core point of student succed. Students perceive if they do not read or study, they will be left behind. This self-awareness encourages them to learn continously and improve their academic achievement (Lackner et al. ., 2021) .

This learning behavior can be created with innovative learning in online learning (Yao et al., 2022) .

CONCLUSION AND IMPLICATION

In conclusion, Flipped Learning partially has a positive and significant effect on learning outcomes. However, Self-Regulated Learning partially has no significant effect on learning outcomes. Both of two independent variables (Self-Regulated Learning and Flipped Learning) simoultanously have a positive and significant effect on learning outcomes. It was found that the most contributing indicator of Self-Regulated Learning in Flipped Learning was Revisit action indicator. These recent findings contradict with previous research because students' SRL skill is not adequate to mastery learning material. It requires learning environment modification to optimize students' SRL skill. One of modification can be done by equipping students with learning video in flipped learning. Therefore, it is suggested for teachers to not only focus on the students' SRL skill but also to innovate in developing learning activities in the classroom. Self-Regulated Learning skill is important to be possessed by students, however learning innovations is needed to maximize students' SRL skill.

For students, it is important to build Self Regulated Learning which will be able to change the way of learning towards a better direction and be able to improve student achievement. The following researchers are recommended to develop further research involving the development of other learning tools to optimize self-regulated learning and flipped learning.

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ЧИ САМОРЕГУЛЮВАНЕ ТА «ПЕРЕВЕРНУТЕ НАВЧАННЯ» ІЗ ВИКОРИСТАННЯМ НАВЧАЛЬНОГО ВІДЕО ВПЛИВАЄ НА РЕЗУЛЬТАТИ НАВЧАННЯ? (ДОСВІД ІНДОНЕЗІЇ)

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Анотація. *Це дослідження має на меті визначити, як впливає саморегульоване навчання та «перевернуте навчання», що паралельно або частково супроводжується відеонавчанням на результати навчання, а також знайти показники саморегульованого навчання, які найбільше сприяють навчанню, яке здійснюється за допомогою навчальних відео. Це дослідження є кількісним дослідженням із загальною вибіркою 84 учні з 2021 класу парного семестру 2021/2022 навчального року. У дослідженні використовувалися анкети та письмові тести як інструменти дослідження. Техніка аналізу даних використовує множинну регресію з фіктивними змінними. Перевернуте навчання є фіктивною змінною. На основі результатів дослідження було виявлено, що перевернуте навчання та саморегульоване навчання одночасно мали значний і позитивний вплив на результати навчання; часткове перевернуте навчання вплинуло на результати навчання, тоді як часткове саморегульоване навчання не мало істотного впливу на результати навчання. Було встановлено, що індикатор «повторного відвідування» є одним із найбільших значущих показників у перевернутому навчанні, що впливав на результати навчання. У цьому дослідженні це призвело до висновків, які відрізнялися від попередніх досліджень. А саме, часткове саморегульоване навчання не вплинуло суттєво на результати навчання студентів. Припустимо, це відбулося тому, саморегульованого навчання недостатньо для розуміння студентами навчального матеріалу. Щоб оптимізувати саморегульоване навчання у навчальній діяльності студентів, потрібні зміни зовнішнього середовища, одним із яких є використання навчальних відео при перевернутому навчанні.*

Ключові слова: саморегульоване навчання; перевернуте навчання; навчальне відео; результати навчання.