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THE EFFECT OF MOBILE SEAMLESS BASED ON MULTICULTURAL EDUCATION TOWARDS THE ENHANCEMENT OF LEARNING OUTCOMES MODERATED BY ACADEMIC SELF-EFFICACY

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Abstract. Learning outcomes have an important role in the learning process. But nowadays, being proficient in theory and getting good learning outcomes is not the only goal of Education to be achieved. In the learning process also requires students to be able to give respect and appreciation for human dignity. In this 21st century, it is time for students to be allowed to choose their way and style of learning, where students can determine when and where they will study. Thus, this study is here to determine the effect of seamless learning based on multicultural education on learning outcomes moderated by academic self-efficacy. This research is experimental quantitative research. The population in this study is all students of Christian Middle School Anugerah *Kei Kecil*. The sample in this study is selected using a clustered sampling technique in which certain groups that already exist in a population are selected as samples. The data in this study are obtained from a questionnaire using a Likert scale. The data in this study are then analyzed in several stages. Based on the results of hypothesis testing, it is known that academic self-efficacy is able to moderate the implementation of seamless learning based on multicultural education on student learning outcomes. Students, teachers, and parents must start adapting online learning tools in order to be able to get more knowledge and sources of information besides, in habituation and daily learning teachers and parents also need to introduce students to diversity so that students understand the value of tolerance.

Keywords: *Mobile Seamless; Multicultural Education; Learning Outcomes; Academic Self-Efficacy*

I. INTRODUCTION

The success of students in achieving learning outcomes for each student is different. Learning outcomes have an important role in the learning process. It is because learning outcomes can be used as a benchmark to find out how far the changes in students after receiving their learning experiences that can be observed and measured in the form of knowledge, attitudes, and skills (Mahajan & Singh, 2017). Good learning outcomes will be stored for a long time or will not even be lost forever because learning outcomes participate in shaping individual personalities who always want to achieve better results so that they will change the way of thinking and produce better work behaviour (Orón Semper & Blasco, 2018).

To improve learning outcomes, students need to be supported by a certain strategy, one of which is through the application of Mobile Seamless. In this 21st century, students should be allowed to choose their way and style of learning, where students can determine when and where they will study (Chai et al., 2016). This desire or emotional mood to learn everyone can happen anytime and anywhere; when it occurs,

students need to be accommodated to be able to learn immediately, including the provision of learning resources, learning media, and learning environments (Fletcher & Nicholas, 2016). With these conditions, it is possible for students to learn with various scenarios, in formal or informal conditions, in the classroom or outside the classroom, individual or social, digital and non-digital media, or the physical environment or virtual environment. In addition, seamless learning provides opportunities to collaborate and interact in various ways with peers, learning resources and the physical world; besides, this interaction is also carried out through virtual worlds. However, nowadays, being proficient in theory and getting good learning outcomes is not the only goal of education to be achieved. The learning process also requires students to be able to give respect and appreciation for human dignity; one of which is through the application of a multicultural-based seamless mobile (Foomani & Hedayati, 2016).

In the application of mobile seamless based multicultural, students can do learning without the barriers of space and time accompanied by materials and mentors who are able to instill the concept of diversity that recognizes, accepts, and affirms

human differences and similarities associated with gender, race, class, and religion based on values and democratic understanding that builds cultural pluralism in an effort to combat prejudice and discrimination. Learning is directed at understanding the cultural differences that exist in students such as differences in ethnicity, religion, language, gender, social class, race, ability and age so that the learning process becomes effective and easy. Thus, not only optimal learning outcomes are obtained, but students are also able to absorb different values (Suárez et al., 2018).

The willingness and perseverance of students when studying will increase when students have good self-efficacy (Hong et al., 2017). Academic self-efficacy can increase students' confidence in their ability to carry out and organize certain activities well. The more a person feels confident in their abilities, the greater the effort they do; in addition, the more active they are is because they believe their abilities can help in carrying out a task in dealing with obstacles/challenges to achieve high academic achievement. Research by Psycharis & Kallia, (2017) suggests that students with high self-efficacy obtained higher scores on 50 mathematical problems test. Research by Issac Ampofo Atta who tried to determine the effect of students' perceptions on self-efficacy in programming subjects at tertiary institutions found that students see programming as easy with dedication is the lowest perception of programming for students. Thus, the view of students also affects how students carry out learning activities.

In addition, the results of the research conducted by Hasan, learning strategies through mobile aids in increasing students' learning motivation are carried out through making learning plans, determining learning goals and objectives, using methods, utilizing learning media, and assessing planned and systematic manner done. Thus, the view of students also affects how students carry out learning activities.

Learning outcomes are one of the important things; good learning outcomes are one of the characteristics of achieving learning objectives (Kyndt et al., 2016). However, growing up in a country that has various ethnic groups and religions requires the cultivation of values about various social statuses, races, ethnicities, religions in order to create an intelligent personality in dealing with problems of cultural diversity. In this research, seamless learning integrated with multicultural has not been found. In this study, researchers try to apply the influence of mobile seamless-based multicultural education on learning outcomes moderated by self-efficacy. Wong et al., (2016) created 10 dimensions of the mobile seamless learning environment, as follows.

- MSL1: covering both formal and informal learning
- MSL2: including personal/personal and social learning
- MSL3: learning that happens through time
- MSL4: learning that takes place across locations
- MSL5: ubiquitous access to knowledge (a combination of context-aware learning, augmented reality learning, and ubiquitous access to online learning

resources)

- MSL6: covering both digital and non-digital worlds
- MSL7: combining the use of different types of devices
- MSL8: seamless and fast switching between multiple learning tasks (such as data collection + analysis + communication)
- MSL9: knowledge synthesis (previous and present knowledge and multiple levels of thinking skills and/or multidisciplinary learning)
- MSL10: including multiple pedagogical or learning activity models (facilitated by educators)

According to Wong et al., (2016), the placement of learners as learner-centric does not mean that they are the center of attention of educators alone, but are centers of producing knowledge that occur in various contexts in multidimensional learning spaces.

II. THEORETICAL REVIEW

A. *Mobile Seamless- Based on Multicultural education*

Richardson et al., (2018) defines seamless learning as continuity in learning with various scenarios using mobile devices. Expert definitions of seamless learning vary; but in general, this concept refers to the transition between contexts and learning scenarios that occurs as smoothly as possible.

Seamless learning based on multicultural education supports learners to learn when they want to learn, even in various scenarios and they can move from one scenario to another quickly and easily by learning the diversity of values, cultures, and tolerance of each other. The space for seamless learning based on multicultural education consists of various scenarios where students are active, productive, creative, and can collaborate across different learning environments at any time and wherever the learner is (Looi et al, 2009).

Seamless learning based on multicultural education starts from a philosophy of cultural pluralism into an education system based on the principles of equality, mutual respect, and acceptance, as well as understanding and a moral commitment to social justice that is packaged in unlimited learning, so that it can be directly accessed on a gadget or computer device whenever and wherever students want to learn (Chai et al., 2016).

B. *Student Performances*

Learning outcomes cannot be separated from learning activities, because learning activities are a process, while achievement is a result of the learning process. A person's learning outcomes are in accordance with the level of success of learning the subject matter expressed in the form of grades or report cards for each field of study after experiencing the teaching and learning process (Hughes et al., 2018). Student learning outcomes can be known after an evaluation is held. The results of the evaluation can show the high or low student learning outcomes. Learning outcomes in the field of

education are the results of measurements of students which include cognitive, affective, and psychomotor factors after participating in learning process which are measured using relevant test instruments(Hamilton et al., 2021).

Table 1

Dimension and Indicator of Student Performance		
Realm	Dimension	Indicator
Cognitive	Factual	Students mention the type of culture described
	Counselling	Students explain cultural differences students connect history with social culture
	Procedural	Students explain coherently the parts of the traditional house
	Metacognitive	Students are able to understand cultural diversity
Affective	Religious	Students take actions based on the teachings of their religion
	Curiosity	Students perfect their knowledge
	Honest	Students show their work based on what they did
	Responsibility	Students complete assignments that should be done
	Discipline	Students fulfil assignments in a coherent manner
	Hard work	Students do the task seriously
	Tolerance	Students hear other people's opinions
Psychomotor	Environmental care	Students initiate concern for the environment
	Observe	Students listen to the explanation of the material
	Ask	Students ask about what they have observed
	Gathering information	Students complete assignments from various sources of information
	Reasoning	Students make conclusions based on the relationship between various types of facts/concepts/theories/opinions
	Communicating	Students make reports clearly and structured

to produce certain skills. According to Bandura (in Prior et al., (2016)), students are more likely to engage in certain behaviors when they believe that they will be able to carry out the behavior successfully, when they have self-efficacy.

Utami, (2017) revealed that academic self-efficacy is an individual's belief that they can successfully reach a predetermined level by completing academic tasks or achieving specific academic goals. Bandura, in (Kolk et al., 2015), states that academic self-efficacy can be defined as the belief that a person has about his or her ability or competence to direct motivation, cognitive abilities, and take the necessary actions to do assignments, achieve goals, and overcome academic challenges. Students with low self-efficacy in learning can avoid many learning tasks, especially those that are challenging. Meanwhile, students with high self-efficacy face these learning tasks with great desire. Students with high self-efficacy are diligent in learning tasks compared to students with low self-efficacy. Therefore, it can be concluded that academic self-efficacy is a person's belief in his ability or competence in doing academic tasks to form relevant behaviour.

Table 2

Dimension and Indicator of Academic Self-Efficacy	
Dimension	Indicator
Magnitude	1. Optimistic in doing lessons and assignments
	2. Making a plan to complete the task
	3. Feeling confident that you can do and complete tasks
Strength	4. Commitment in completing the assigned tasks
	5. Persistence in completing tasks
	6. Having a good self-motivation for self-development
General	7. Responding well to different situations and think positively
	8. Making life experience a way to achieve success
	9. Able to handle all situations effectively

III. METHODS

This research uses experimental research with quantitative approach. Experimental research is research that is intended to determine whether there is a result of "something" imposed on the research subject. The design of this study uses a quasi-experimental by involving control group and experimental group.

C. Academic Self-Efficacy

Honick & Broadbent, (2016) defines self-efficacy as belief in the ability to organize and perform the actions needed

Table 3
 Research Design

Variable	Learning method	
	Control Class	Experiment Class
Student performances	Conventional	Seamless learning based multicultural education
High academic self-efficacy	X1Y1	X2Y1
Low academic self-efficacy	X1Y2	X2Y2

The subject of this study is students of Cristian Middle School *Anugerah Kei Kecil*. The sampling technique used in this study is a probability sampling technique with a clustered sampling method. Clustered sampling method is a sampling method in which certain groups that already exist in a population are selected. Therefore, the sample in this study is 7thA grade class as control group and 7thB grade class as an experimental class.

The data in this study are obtained from the results of the pre-test and post-test results and the questionnaire given. As for the questionnaire, the researcher gave a questionnaire to the students after the pre-test and post-test in each control and experimental class to see if there is an effect of project-based learning based on local wisdom in social studies learning to improve critical thinking skills moderated by self-efficacy.

IV. RESULT AND DISCUSSION

A. Validity Test

Based on the results of the calculation of the validity of the instrument, it is known that all items have an r-count value that is greater than the r-table; thus, it can be concluded that all instrument items are valid and feasible to use. In detail the results of the calculation of the validity test can be seen in the following table.

Table 4
 Validity Test Result

Dimension	r-count	r-table	Result
Student Performances			
Cognitive	0.645-0.815	0.214	Valid
Affective	0.725-0.880	0.214	Valid
Psychomotor	0.691-0.872	0.214	Valid
Academic Self Efficacy			
Magnitude	0.801-0.899	0.214	Valid
Strength	0.780-0.812	0.214	Valid
Generality	0.769-0.871	0.214	Valid

B. Reliability Test

Reliability testing is conducted to determine whether the measuring instrument designed in the form of a questionnaire is reliable. A measuring instrument is declared reliable if the measuring instrument is used repeatedly will give relatively the same results (not much different). The decision-making criteria to determine reliability is if the value of r (Cronbach's alpha) is greater than 0.60 then the instrument is said to be reliable. On the other hand, if the value of r (Cronbach's alpha) is less than 0.60, the instrument is not reliable. In detail, the results of the reliability test calculations can be seen in the following table.

Table 5
 Reliability Test Result

Variable	Alpha Cronbach		
	Alpha	Standard	Result
Student Performances	0.863	0.600	Reliable
Academic Self Efficacy	0.870	0.600	Reliable

Based on the calculation results of the instrument reliability test, it is known that each variable has a Cronbach alpha value > 0.6; thus, it can be concluded that all instruments have a decent level of reliability.

C. Classic Assumption Test

Normality Test

In the following, the results of the assumption test as a condition for the ANOVA test are presented based on the normality and homogeneity of variance test. The normality test is carried out using the Kolmogorov-Smirnov test method and the homogeneity of variance test was carried out using the Levene test method.

Table 6
 Normality Test Result

Variable	Level	Kolmogorof Smirnov	
		Statistics	Sig.
Student Performances	Conventional	0.533	0.344
	Seamless learning based multicultural education	0.421	0.412
Academic Self-Efficacy	High	0.230	0.241
	Low	0.301	0.337

The results of the normality test for the student performances variable based on the learning method factor obtained a significance value greater than 0.05 ($p > 0.05$), as

well as the academic self-efficacy variable, both high and low, which received a Sig score > 0.05 so that the data for both variables are considered normally distributed.

Homogeneity Test

The results of the test of the homogeneity of the student performances variable assumption based on learning method factor obtained a significance value greater than 0.05 ($p > 0.05$), so that the variance of the data between groups was considered homogeneous.

Table 7
 Homogeneity Test Result

		F	df1	df2	Sig.
Critical Thinking Skills		2,420	2	58	0.269

D. Hypothesis Test

Table 8
 Hypothesis Test Result

		M	SD	F	Sig.	Results
Learning methods	Mobile	77.21	7.29	24,450	0.000	Significant
	Seamless-Based on Multicultural Conventional	55.81	7.72			
Academic Self-Efficacy	High	71.31	7.90	15,339	0.000	Significant
	Low	61.50	7.98			
Interaction	High	86.21	9.23	15,415	0.000	Significant
	Academic Self-efficacy					
	Mobile Seamless-Based on Multicultural					
	Low	71.24	8.43			
	Academic Self-efficacy					
	Mobile Seamless-Based on Multicultural Conventional	67.00	11.10			
High Academic Self-efficacy	Conventional	42.61	6.37			
	Low					
	Academic Self efficacy					

E. Effect of Mobile Seamless Based on Multicultural towards Student Performances

Based on the test results, it is known that there are significant differences in the learning outcomes of students who receive learning using conventional methods and students

who receive seamless learning based on multiculturalism. This is based on the average value of student learning outcomes where the group of students who receive multicultural-based seamless learning gets a higher average (77.21) compared to students who receive conventional learning (55.81). This is also reinforced by the results of the ANOVA test which shows a significance value of $0.000 < 0.05$, so it can be concluded that there is a significant difference between the learning outcomes of students who receive multicultural-based seamless learning and students who receive conventional learning. The results of the study support the findings of (Abdul Jabbar & Felicia, 2015; Hamid et al., 2019; Midun et al., 2019). This research found that mobile learning is able to facilitate students' affective learning outcomes, which provides more convergent evidence for the effects of using computers in learning and teaching. Possible reasons may include that mobile learning integrated more diverse type of teaching or learning strategies and involved more different learning scenarios in different situations.

Entering the current era of society 5.0, it is time for students to be allowed to choose their way and style of learning, where students can determine where and when they will study. In addition to freedom of learning, character development integrated in learning is always considered. In multicultural-based seamless learning, students are given the opportunity to learn to collaborate and interact in various ways with peers, learning resources, and the physical world; besides, this interaction is also carried out through virtual worlds. Students are also given an understanding of the differences between their tribes by providing an understanding that ultimately creates a sense of respect for one another. Through this understanding, the improve learning outcomes and knowledge of students are identified. In regards to the findings, L. H. Wong, (2015) states that the most successful learners are those who understand differences and are able to sympathize with one another.

F. Effect of Mobile Seamless Based on Multicultural towards Student Performances Moderated by Academic Self-Efficacy

Based on the results of hypothesis testing, it is found that there are significant differences in student learning outcomes who took part in seamless learning based on local wisdom moderated by low academic self-efficacy and high self-efficacy. Learners who receive multicultural-based seamless learning with high academic self-efficacy get an average score of 71.31 and 09.81 points below (61.50) that are the averages obtained by participants who receive multicultural-based seamless learning with low academic self-efficacy. This statement is reinforced by the results of the Anova test which shows a significance value of $0.000 < 0.05$; thus, it can be concluded that there is a significant difference between multicultural-based seamless learning moderated by high academic self-efficacy and multicultural-based seamless learning moderated by low academic self-efficacy. on student learning outcomes. The results of this study support the findings by Menon et al., (2020) which state that self-efficacy

affects the ability to use technology for elementary school teachers.

On the findings of Hayat et al., (2020) found that students' self-efficacy impacts their learning-related emotions and metacognitive learning strategies, and this, in turn, affects students' academic performance. In addition, learning-related emotions influence metacognitive learning strategies, which in turn mediate the effects of emotions on academic performance.

Multicultural-based seamless learning supports students to learn when they want to learn, even though they are in various scenarios and they can migrate from one scenario to another quickly and easily. Therefore, the space for seamless learning consists of various scenarios where students can be active, productive, creative, and able to collaborate across different learning environments at any time and wherever the students are (Lin et al., 2019). Through seamless learning, students are able to study with peers who are different from them and they will know other cultures in other countries. This is because seamless learning does not limit students to study in the same space and time. The teaching and learning process in multicultural-based seamless learning can occur anytime and anywhere without being limited by time and space. The existence of mobile devices such as smartphones is what supports the teaching and learning process that can occur outside of that context. This statement is also supported by the findings of (Shi et al., 2018) who stated that fostering a school climate that supports multiculturalism can increase empathy for groups outside ethnic groups.

G. Interaction Between Mobile Seamless Based on Multicultural, Academic Self-Efficacy, and Student Performances

Based on the results of calculations applied using the ANOVA test, it is found that there is an interaction between multicultural-based seamless learning and academic self-efficacy on student learning outcomes. It can be seen from the significance value of $p < 0.05$ and the average value of student learning outcomes who receive multicultural-based seamless learning for students who have high academic self-efficacy of 86.21 compared to the average score of students who received seamless learning based on multiculturalism who had low academic self-efficacy, which is 71.24. Based on the results of the calculations applied using the ANOVA test, it is found that there is an interaction between conventional learning and self-efficacy on student learning outcomes. It can be seen from the significance value of $p < 0.05$ and the average high academic self-efficacy is 67.00 compared to students who receive low conventional learning of 42.61. The results of this study are in accordance with the findings of Yokoyama, (2019) stating academic self-efficacy is able to moderate the relationship between a learning method and student performance. Research by (Nikou & Economides, 2016); (Honicke & Broadbent, 2016); (Talsma et al., 2018)) revealed that higher academic self-efficacy scores are more likely to result in higher levels of academic performance.

Furthermore, students who have good academic self-efficacy will be more likely to be involved in academic

activities and feel confident that the individual is able to succeed in doing it. In addition, students will also be brave in setting high achievement targets. Academic efficacy in students will affect the selection of activities, goals, and efforts as well as individual persistence in class activities. Low academic self-efficacy can also cause individuals to drop out of school. Based on research conducted by Peguero & Shaffer, (2015), Academic self-efficacy can facilitate educational progress and minimize the risk of dropping out of school in adolescents.

V. CONCLUSIONS

Based on the test results, it is known that academic self-efficacy is able to moderate the implementation of seamless learning based on multicultural education on student learning outcomes. Students, teachers, and parents must start adapting to online learning tools in order to be able to get more knowledge and sources of information. Those who are not good at using online learning tools may not achieve high enough academic success in online learning settings. Both teachers and parents need to involve a sense of mutual respect so that students will be able to become good social beings. For future researchers, it is recommended to examine what factors are able to influence student learning outcomes so that more relevant research findings are obtained.

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