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The effectiveness of blended learning with combined synchronized and unsynchronized settings on self-efficacy and learning achievement

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ABSTRACT

This study analyzed the effect of blended learning with combined synchronized and unsynchronized settings on self-efficacy and achievement of the students in learning basic design. The population was 145 students of vocational schools (*sekolah menengah kejuruan*/SMK) who learned basic design. The schools were selected through multistage random sampling which selected four schools with 115 students. The data for self-efficacy were collected with a questionnaire and those for learning achievement with a multiple-choice test. The data were analyzed using descriptive statistical test and inferential statistical test of multivariate analysis of variance (MANOVA). The study found that blended learning with combined synchronized and unsynchronized settings has a positive effect on the students' self-efficacy and learning achievement in basic design, thus making the learning more joyful and more conducive.

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1. INTRODUCTION

Today education is experiencing a very big challenge throughout the world, in which the educational process is expected to produce graduates who can compete globally. Another challenge in this world today is COVID-19 pandemic that has changed human life in all fields [1]–[4]. One of the fields that has received most impact is education [5], [6]. This pandemic impact is being felt by the students, both elementary, junior secondary school, senior secondary school, and college students. The process of learning which used to be face to face has to be changed into online to prevent COVID-19 transmission [7], [8] and all activities such as seminar, workshop conference, and other activities are postponed and even canceled [9]–[12].

Today online learning has become a trending topic, while it used to be disapproved for children because of its detrimental effects on their social and emotional development since there is a lack of social interaction and is dangerous for children's health and growth [13], [14]. A different perspective emerged from some educational scholars, who state that online learning will help students to understand abstract materials, develop collaborative learning, reasoning, and problem solving activities [15]. Thus, it can be said that online learning today is a solution to the learning process at the pandemic time. Online learning is a learning carried out with the help of the internet both in synchronized and unsynchronized ways which give opportunities for interactions between the students and learning resources, both the teacher/environment and peers [16]. Online learning gives an opportunity to the students to share opinions and to do more individual learning without being bound by time and space or more flexibly [17]–[19].

The applications that are usually used in an online learning process are Google Meet, Google Classroom, WhatsApp, and social media [1], [20]. Now the easiest to use application in learning process is WhatsApp. All activities done, such as giving tasks to the students is done through WhatsApp. If the students still do not understand the material, the teacher will send videos or call the students up with a WhatsApp's video call. Even collecting tasks is more easily done by the students through WhatsApp, the students usually take a photograph of the tasks and send them to the teacher [21].

However, online learning does not always have a positive effect, it causes social isolation, fewer interactions, participations, and limited feedbacks. The parents' non-readiness to accept online learning is caused by the fact that unlike the traditional teaching online learning lacks a formal atmosphere and social interactions among the students [16]. Many students do not learn, but doing other activities, such as playing games, using social media, and watching YouTube that become dependent on them [22]–[24]. Another problem is because the teacher gives them too complicated tasks the students get frustrated and do not want to learn. This condition was shown by the result of an observation made and an interview. The results of the observation and interview showed that the online teaching that was done only by using WhatsApp made the students bored to learn and lose motivation and interest in the teaching materials given. Beside the method used by the teacher, one of the factors that caused the decrease in interest in learning was the lack of good feedbacks from the teacher about what the students had done. This was caused by the lack of good interactions between the students and learning resources and between a student and their peers. This condition will have a strong effect on learning and the quality of the output of education.

Learning achievement is all kinds of results of a learning process, in the form of knowledge, skill, and attitude. Learning achievement is very much influenced by emotion the student experiences during the learning process [8], [25], [26]. A good learning achievement will be obtained by a student if the learning process gives them an opportunity to be more active in learning and when they discover the knowledge. The more active students in the learning process, the more meaningful will it become. Meaningful learning will occur if the students get experiences and are able to develop emotional intelligence and if the teaching process is conducted with the constructivist approach [27], [28].

The students' experience will develop if the learning process gives them the opportunity to interact with other students. Interaction is a communication process between the students and the teacher, the students and the learning resources and the students with their peers. A good interaction that occurs between a student and their peers significantly contributes to the development of a more conducive and joyful learning condition. Learning with peers will encourage a student to take an active role in learning [29], [30]. Peers will help, guide, and support each other in such a way that they are able to learn through interaction and collaboration [31]. A learning that involves peers will reduce anxiety and stress, with the guidance, the help and feedbacks given by the peers to a student will increase their self-confidence [32], [33]. Thus, it can be said that with good interactions between the students and learning resources and between the students and the peers a more conducive learning condition will develop.

A learning process cannot be separated from the process of feedback, with feedbacks the students will become more active and motivated in attending the class [34]. It is important for the teacher to give feedbacks, since it will give an impression about the learning process. The feedbacks to the students' tasks in online learning is very important to make the students active and engaged in the learning process [35], [36]. Giving feedbacks in learning is a way how the teacher interacts in online learning with the students [37]. Learning process cannot be separated from evaluation process and one form of evaluations given is through feedbacks on what is done by the students. In addition, feedbacks can reduce student anxiety during the learning process [38]. Feedbacks help in developing the students' motivation which later will influence their learning achievement. Another effect is that they can develop students' self-efficacy.

Self-efficacy is a person's optimism about their competence in knowledge, skill and attitude so that they can attain goal in life. With a high self-efficacy, a person will be able to face challenges and obstacles based on their level of knowledge and skill [39]. Self-efficacy is more related to the development of motivation which is dynamic and very sensitive to changes and fluctuates from time to time [40]. There is evidence that self-efficacy plays an important role in learning [41], [42]. Self-efficacy has a positive effect on the student's motivation in the learning process [43], [44].

Based on the explanation, it can be said that a high self-efficacy will have a significant effect on the student's performance in the learning process. Learning achievement can be increased by reducing anxiety and self-efficacy [45]. Self-efficacy focused learning process will engage meta-cognitive process and motivation as well as a better performance [46], [47]. Self-efficacy will develop better if the student has self-confidence and this will of course have an effect on the student's learning achievement. Thus, there is a collaboration between learning achievement and self-efficacy, with self-efficacy the student will feel more competent in doing the tasks and attending the class [48]. To develop self-efficacy one needs to have a more collaborative and autonomous learning process that is not too demanding for the student [49].

It is the teacher's duty to think how to create a learning situation that is suitable for today's condition and learner characteristics that enable the teachers to reach the goal of the national education and prepare human resources that are ready to compete in the global era. To realize this then we need a learning condition that supports the achievement of the goal. Thus, there is a need for a change in the learning process that is being implemented today. With the pandemic condition, the learning process has to be carried out online which does not only take place in a synchronized way but also in an unsynchronized way.

Distance learning is different from face-to-face learning and one important factor that has an effect in the distance learning is the interaction between the students and the teacher [50]. Online learning process is influenced very much by the application used, since by selecting and using the application the teacher will help the interactions that occur [51]. Online learning processes are grouped into two divisions that which uses a synchronized method and unsynchronized method. An unsynchronized online learning method is the online learning method which is not bound by time and place. It uses email, web, and bulletin board [52]. While, the synchronized online learning is related to an online learning that gives more emphasis on time and interactions, since this method gives opportunities to the students to do virtual face-to face interactions [53].

The applications used are Google Meet and Zoom. The use of synchronized method makes the students frustrated since the learning process is too fast, while the unsynchronized method tends to make the students lose interest to learn since they can go to and forth in the process [53]. The synchronized learning motivates the students more in learning and its weakness is more related to the system and facilities, while the unsynchronized mode gives opportunities to keep attending the class although there is a technical problem [53], [54]. Based on the explanation a solution can be made, that is, by using a learning process that combines the synchronized mode and the unsynchronized one. The weaknesses of one mode will be compensated by the strengths of another one so that an effective online learning can be found or used.

The online learning that combines synchronized and unsynchronized methods has a significant effect on the learning process. The method that combines the synchronized and the unsynchronized modes has a different effect from that of the usual face-to-face learning method [55]. The learning process that combines face-to-face method and the online learning method has a positive effect on learning [56]. The learning with the combined methods produces a significantly higher learning achievement than a partial method. Partially the unsynchronized method is more effective [57]. Thus, it can be said that the use of the combined method enables the teacher to implement a better learning process.

This study aimed to analyze the effect of blended learning with the combined synchronized and unsynchronized settings on students' self-efficacy and learning achievement in basic design. This study would produce a learning approach of blended learning with the combined synchronized and unsynchronized settings. This method will give the opportunity to the students to interact and to motivate themselves in the learning process. The combined method was created by integrating the platforms used in learning by using email, WhatsApp, Google Meet, Zoom, and other platforms. By combining these methods, the weaknesses of each of these methods can be minimized or even eliminated.

2. RESEARCH METHOD

This study was a quasi-experiment with the single factor independent group design using covariate. In the implementation of research designs with this type the experimental group is treated by following a learning process that applies a blended learning that combines synchronized and unsynchronized settings and the control group is given a treatment in the form of blended learning with synchronized settings. In general, the forms of treatments given to the experiment group and the control group can be explained by the steps in basic design on Table 1.

The population of this study was all students of vocational schools (SMKs) throughout Bali, Indonesia. The criteria of the target population were: i) Public vocational schools; ii) Having fashion specialization program; iii) Having the ninth grade of fashion specialization program; iv) Having 20 students in each class; and v) The distance between one vocational school and the others was not less than 1,000 meters. The population size of five public vocational schools in the fashion specialization: SMKN 1 Seririt, SMKN 2 Singaraja, SMKN 2 Sukawati, SMKN 3 Denpasar, and SMKN 4 Denpasar was 145 students.

The selection of the schools as the sample of the study used the multistage random sampling technique which was done in the following stages: i) Determining the regencies that have public vocational schools to be selected as the sample of the study based on the specified criteria; ii) Determining public vocational schools that have fashion specialization study programs; iii) Administering equivalence test in prior ability of the classes to be used as sample; iv) Determining four classes as sample of the study (two classes for experiment group and two classes for control group). The sample in this study consisted of SMKN 2 Singaraja and SMKN 3 Denpasar as experiment classes and SMKN 1 Seririt and SMKN 4 Denpasar as control classes.

Table 1. Description of treatments in the study groups

Study groups	Treatment description	
	Unsynchronized	Synchronized
Experiment group	Uploading materials and videos in the online learning website. Showing the online website, giving an instruction to study in groups or individually. Giving tasks online related to the materials learned. Assigning the students to make questions related to the materials being learned online.	Opening the teaching by greeting the students. Checking the students' presence. Asking an opening question related to the material that has been learned online by the students. Discussing the material and videos that have been learned online. Continuing tasks given online. Reflecting on the performance of the activities that have been done. Giving an instruction related to the next materials that have to be learned by the students online.
Control group		Explaining the learning objective. Preparing the students to learn. Informing and demonstrating the skill through video. Informing the knowledge step by step. Assigning a task in the form of a small project. Guiding the students in doing the task. Giving feedbacks. Giving an instruction to continue doing the unfinished task outside of the classroom individually.

There were two groups of data collected in this study: i) The data needed for validating the study instrument and learning materials; and ii) The data needed for answering study questions and testing the hypotheses. The data of self-efficacy were collected by using questionnaire and those of learning achievement by a multiple test. The instruments development: the explanation of the conceptual definitions of the variables, the operational variables the instruments validation, and the instrument grid. Based on the conceptual and operational definitions of self-efficacy, an instrument grid of self-efficacy is presented on Table 2. This grid was used as the reference in writing the instrument used in this study. Based on the result of validity testing of the questionnaire items using SPSS 25.0 for Windows, all items are valid.

Table 2. Self-efficacy grid

No	Indicators	Number of statements
1	Believes that the tasks given can be completed	5
	Believes that the problems given can be solved	4
	Believes that the challenge can be faced	5
2	Believes in one's ability when facing a certain situation or condition	5
	Believes in one's ability when facing a more difficult situation and condition	3
3	Is resilient in completing a task and solving a problem given	3
	Is persistent in completing tasks and problems given	3
	Believes very much that one can complete tasks and has a strong ability to complete tasks and problems given	3
	Is steadfast in completing tasks and solving problems	4
	Total	35

Basic design learning achievement is the score of abilities in the psychomotor domain that a student has in creating a fashion using a performance test. The performance test for basic design covers: the exactness of body proportion, the use of various poses of body movement, the match between the type of textile in the design, the use of elements, design principles, and punctuality. The grid for basic design learning achievement can be seen on Table 3. Based on the result of the validity testing reliability testing, level of difficulty, and power of discrimination of the learning achievement instrument usually used only 25 out of 27 items that were made that could be used.

Table 3. Grid of basic design learning achievement

No	Basic competence	Indicators	Number of problems
1	Using human body anatomy pictures for the mode sketch	Using human body anatomy for the mode sketch	2
		Drawing human anatomy drawing for the mode sketch	4
		Analyzing human body anatomy for the mode sketch	2
		Choosing tools and material for human body anatomy for the mode sketch	1
		Evaluating types of human body anatomy for the mode sketch	2
2	Analyzing a picture of parts and forms of fashion	Selecting types of the drawing of fashion parts and the form of the dress	2
		Comparing the functions of the drawing of the parts and forms of dresses	3
		Analyzing the drawing of dress parts and forms	3
		Evaluating the drawing of parts and forms of dress	3
3	Using a design with collage	Comparing collage design and other designs	3
		Selecting the tools and material for making a collage design	1
		Telling in detail how to design with collage	1

3. RESULTS AND DISCUSSION

When the results of the measurement of central tendencies (mean, mode, and median) and the measurement of data distribution (variance and standard deviation) were compared to the prior knowledge covariables: self-efficacy score and basic design learning achievement score, the means of self-efficacy and learning achievement of the experiment classes and control classes were obtained. The data of self-efficacy of the students that attended blended learning with combined synchronized and unsynchronized settings had the theoretic score range between 0-100, n=58, minimum score=70, maximum score=94, the range=24, the number of interval classes=7, the length of the interval class=4, mean=83.03, standard deviation(s)=6.55, mode=91, and median=83.While the data on self-efficacy of the students who attended a synchronized setting learning had the theoretical range between 0 to 100, n=57, minimum score=65, maximum score=93, the range=28, the number of interval classes=7, the length of interval classes=4, mean=81.49, standard division (s)=6.85, mode=80, and median=81.

The data on the learning achievement of the students who attended blended learning with combined synchronized and unsynchronized settings had the theoretical score range between 0 to 100, n=58, minimum score=71, maximum score=100, the range=29, the number of interval classes l=6, the length of interval class=5, mean=86.98, standard deviation(s)=7.41, mode=97, and median=86. Meanwhile, the data on the learning achievement of the students who attended blended learning with synchronized setting had the theoretical score range between 0 to 100, n=57, minimum score=68, maximum score=95, the range=27, the number of interval classes=7, the length of interval class=4, mean=81.49, standard deviation(s)=6.85, mode=83, and median=83.

3.1. Prerequisite testing

Normality testing was done to find out whether the data distribution of each group came from a normally distributed population or not. In this study, the normality testing of the data was analyzed by using Kormogorov Smirnov technique, by finding the maximum difference from a cumulative proportion, that is by finding the maximum difference of the cumulative proportion from the data distribution frequency in the lower and upper limits. The testing criterion was H_0 is accepted if $p>0.05$ and H_0 is rejected if $p<0.05$. In this study normality testing was tested to self-efficacy data distribution and students' learning achievement. The group of data on self-efficacy of the students consisted of the self-efficacy data of the students who attended blended learning with combined synchronized and unsynchronized settings (A_1) and the group of students who attended learning with synchronized setting (A_2).

The result of normality test of data distribution of the students' self-efficacy showed that all groups of self-efficacy data whose normality was tested by Kormogorov Smirnov test had $p>0.05$ for each of the data groups. Hence, it can be said that all data groups of self-efficacies of the students in this study came from a normally distributed population. The group of data of the students consisted of the data of learning achievement of the students who attended blended learning with combined synchronized and unsynchronized settings (A_1) and the group of students who attended learning with synchronized setting (A_2). The result of normality test of the data distribution of the students' learning achievement showed that all data groups of learning achievement whose normality was tested with Kormogorov Smirnov test had $p>0.05$ for each of the data groups. Hence, it can be stated that all data groups of the students' learning achievement in this study came from a normally distributed population.

The testing of homogeneity of variance was done to the data group of self-efficacies and learning achievement. In this study the variance homogeneity test was done with Levene's test that showed that all data groups whose homogeneity was tested with Levene's test had $p>0.05$. Hence, it can be stated that all data groups in this study were homogeneous.

The multicollinearity testing of data in this study was done by calculating the correlation coefficient of self-efficacy variable and learning achievement in basic design in each data group. The result of regression linearity test in this study showed that all data groups tested gave the Tolerance value of >0.1 and VIF<10.00 for each data group. Hence, it can be stated that all data groups in this study did not have multicollinearity.

3.2. Hypotheses testing

The hypotheses testing in this study used multivariate variance analysis. The simultaneous difference was shown by p and statistic F of Wilks' Lambda in the multivariate test $p<0.05$ means that H_0 is rejected, which means simultaneously there is a difference in dependent variables after the covariate is controlled. The second test for the independent effect is shown by p and F in the test of between-subjects' effects. The difference in dependent variables simultaneously and separately before statistically controlling covariate is also presented through multivariate test and test of between-subjects' effects in MANOVA.

Based on data analysis the results of hypotheses testing can be obtained. The result of the first hypothesis testing. Based on multivariate analysis, for the learning model (A) and self-efficacy (Y_1) F=58.853 (p=0.0001 ($p<0.05$), therefore, H_1 is accepted, which means that the self-efficacy of the students who learned basic design through blended learning with the combined synchronized and unsynchronized setting (A_1) is significantly different from that of those who learned basic design through the synchronized setting (A_2).

Based on multivariate analysis, for the learning model (A) and learning achievement (Y_2) F=39.265 and p=0.0001 ($p < 0.05$), therefore, H_1 is accepted, which means that the learning achievement of the students who learned basic design through blended learning with the combined synchronized and unsynchronized settings (A_1) is significantly different from that of those who learned basic design through the synchronized setting (A_2). The result of the third hypothesis. Based on the result of multivariate analysis, which presents the result of each test done, i.e., Pillai's Trace, Wilks' Lambda, Hotelling's Trace, Roy's Largest Root ($F=46.786^b$ and p=0.0001 ($p<0.05$)). This means that simultaneously, there is a difference in self-efficacy and learning achievement of the students who learned basic design through blended learning with the combined synchronized and unsynchronized setting and the self-efficacy and learning achievement of those who learned basic design with the synchronized setting.

3.3. Discussion

The main objective of this study was to analyze the effect of blended learning with the combined synchronized and unsynchronized setting on self-efficacy and learning achievement of the students who learned basic design. The result of this study showed that learning model (A) has a significant effect on self-efficacy (Y_1) and learning achievement (Y_2). Based on the findings of this study and the result of the hypotheses testing, the detailed discussion of the findings can be presented is being as.

Firstly, based on the multivariate analysis, for the learning model (A) and self-efficacy (Y_1), F=58.853 and p=0.0001 ($p<0.05$). Therefore, H_1 is accepted, which means that the self-efficacy of the students who learned basic design through blended learning with combined synchronized and unsynchronized setting (A_1) is significantly different from that of those who learned basic design with synchronized setting (A_2). This finding cannot be separated from the learning process that took place in the class with blended learning with combined synchronized and unsynchronized settings in which the students were more active and had more preparation. The blended learning that is carried out by combining synchronized and unsynchronized settings is a learning system that integrates between face-to-face online learning with Zoom or Google Meet with the online learning through WhatsApp or email or social media.

The blended learning is done by combining synchronized and unsynchronized settings, starting from the learning of material contents/tasks online at home and the contents/tasks that have been prepared before by the student, then the student will be asked to learn through conference with Google Meet/Zoom provided by the teacher. With this combination the students will be more enthusiastic to learn because the tasks that they have done will be confirmed directly by the teacher and they can show their tasks to their friends although the learning process is done at home, Thus, with such kind of learning activities, the students will be more motivated in attending the class. Motivation has a role in developing enthusiasm and the students will like to learn. A student with a high motivation will also be enthusiastic to do the learning activities [58]. Motivation increases the spirit and makes the students more active and keeps them interested and ready to learn. Without motivation there will be no activities such as learning [59].

The students who learn in the blended learning environment with the independent learning strategy can improve their perception about self-efficacy, self-regulation, learning environment management, and a search for assistance in learning [59], [60]. Self-efficacy is one optimism toward student ability, both in knowledge, skill and attitude in such a way that they can achieve goal in life. With a high self-efficacy one will be able to face challenges and obstacles on the basis of their level of knowledge and skill [39].

Self-efficacy is related more to the formation of motivation which is dynamic and sensitive to the fluctuation from time to time [40]. Various researches showed that self-efficacy in the learning process can encourage someone to reach learning objective [41], [42]. According to previous studies, self-efficacy has an effect on the student's motivation in learning [43], [44].

In light of the explanation, it can be said that a high self-efficacy will have an effect on the student's performance in learning. Learning achievement can be enhanced by reducing anxiety and improving self-efficacy [45]. Learning process that focuses on the development of self-efficacy will engage cognitive and meta-cognitive abilities and enhance motivation and performance [46], [47]. Self-efficacy will develop well if the student has self-confidence. This will have an effect on the student's learning achievement. Thus, there is a collaboration between learning achievement and self-efficacy, with self-efficacy the student will feel more competent in doing tasks and attending the class [48]. To develop self-efficacy one needs a learning process which is more collaborative and independent and teaching that is not too demanding for the students [49]. Based on the explanation, the students who learn with blended learning with the combined synchronized and unsynchronized settings will have a better self-efficacy than those who learn with learning with synchronized setting.

Secondly, the result of multivariate analysis shows that for learning model (A) and learning achievement (Y_2) F=39.265 and p=0.0001 ($p<0.05$). Therefore, H_1 is accepted, which means that the learning achievement of the students in basic design class who learned with blended learning combined synchronized and unsynchronized settings (A_1) is significantly different from those who learned the same subject with a synchronized setting (A_2). The learning achievement of the students was influenced by the learning process and learning approach implemented by the teacher. Students who learn in a challenging condition are not bound by space and time and this makes them feel more comfortable and freer to act based on the challenge given to them. With a conducive condition, the students feel comfortable, and will have an effect on their understanding. Inter-individual interaction is an important factor that can trigger an individual's cognitive development. This means that the learning process will occur efficiently and effectively if the students learn together with other students in a conducive condition and environment [61], [62].

Blended learning is done with combined synchronized and unsynchronized settings which is basically e-learning in which the traditional teaching can be accessed any time and wherever to improve the effectiveness of the learning process. The blended learning is implemented online and offline (the combination of synchronized and unsynchronized settings) centered on the students, in which they first learn online at home with Google Meet or Zoom that are already available. After learning with Google Meet or Zoom the students will be sent materials and tasks through WhatsApp/email.

With the combination of these learning processes the students will have the opportunity to learn more deeply the knowledge about the materials taught. The combined settings the online and offline learning will complement each other. For example, with the synchronized setting, the teacher will guide the students face to face, and will directly confirm the materials that have been learned by the students. The unsynchronized setting will give the opportunity to the students who did not understand the materials before online since they can learn the materials once again and do the practices to enrich their knowledge without doing it online. In the case of blended learning that is done with synchronized and unsynchronized settings, the students will be active in independent learning outside the classroom. Blended learning was selected because this model of learning combines the positive aspects of the development from direct learning and online learning thus it can create comfort for the students in learning, the ease in understanding the material and they can learn independently more meaningfully.

Blended learning will occur if the students get experiences and are able to develop emotional intelligence and the learning process is carried out with constructivist approach [27], [28]. The students' experiences in the learning process will be effective if the learning process done gives the opportunity to the students to interact with other students. Interaction is a communication process that occurs between the students and the teacher, the students with learning resources, and the students with their peers. A good interaction that develops between the students and their peers will help the development of a more conducive and more joyful condition very much. Based on the previous research, learning with peers will motivate the students to take an active part in learning [29].

Peers will help, guide, and support each other, thus they can learn through interaction and collaboration [31]. Learning that involves peers will reduce anxiety and stress through guidance, help, feedbacks from peers. The students will be able to improve their self-confidence [32], [33]. Blended learning that is done by combining synchronized and unsynchronized settings is one of the solutions in the 21st century learning that puts a stress on the use of information and communication technology as media and learning resources. Based on the explanation, the teaching of basic design by implementing blended learning with combined synchronized and unsynchronized settings can enhance learning achievement better than the teaching of the same subject with synchronized setting.

Third, the result of multivariate analysis shows that in each of the tests done: Pillai's Trace, Wilks' Lambda, Hotelling's Trace, Roy's Largest Root F=46.786[b], and p=0.0001 (p<0.05). This means that simultaneously there is a difference in self-efficacy and learning achievement of the students who learned basic design with blended learning with combined synchronized and unsynchronized settings and self-efficacy and learning achievement of those who learned the same subject with the synchronized setting. Thus, it can be stated that the self-efficacy and learning achievement in basic design at four vocational schools in Bali: SMKN 2 Singaraja and SMKN 3 Denpasar as experiment classes with the treatment of blended learning with combined synchronized and unsynchronized settings are significantly different from the self-efficacy and learning achievement of the students in the synchronized setting at SMKN 1 Seririt and SMKN 4 Denpasar as control classes.

Self-efficacy and learning achievement are influenced by various factors, including the teaching approach used by the teacher. Blended learning is done online and offline (a combination of synchronized and unsynchronized settings) at home with the content provided beforehand, so that it gives the opportunity to the students to learn anywhere and anytime. Blended learning that is done as a combination of synchronized and unsynchronized learning can develop a good learning habit, enhance the initiative to learn, creativity, practical ability, communication, and the ability to work together, problem solving ability, and the ability to enhance the quality of teaching. Blended learning with the combined synchronized and unsynchronized settings are student-centered, in which the students learn online first at home with the help of Google Meet or Zoom meeting prepared beforehand. After learning with Google Meet or Zoom meeting platform, materials will be sent to the students through WhatsApp or email.

With the combination of processes, the students will have more opportunities to enrich their knowledge about the materials taught. With the combined settings for learning (online and offline) each setting will complement its weaknesses with the strengths of the other setting. For example, with the synchronized setting the teacher will guide the students face to face and directly confirm the materials that have been learned by the students. The unsynchronized setting will give the students the opportunity to learn once again the materials that they did not understand before when they learned them online and to do some practices to enrich their knowledge without having got to do it online. In this case blended learning is done with the combined synchronized and unsynchronized setting and the students are active in learning independently outside the classroom. The students are said to have independence in learning if they themselves have the willingness to learn, solve problems, and take responsibilities in fulfilling their responsibility as students. One factor that influences independence is a high self-efficacy.

Learning achievement can be enhanced by reducing anxiety and enhancing self-efficacy [45]. The learning process that focuses on the development of self-efficacy will engage meta-cognitive process and the presence of higher motivation and performance [46], [47]. Self-efficacy will develop well if the student has self-confidence and this of course will have an effect on the students' learning achievement. Thus, there is a collaboration between learning achievement and self-efficacy. With self-efficacy the student will feel more competent in doing task and attending the class [48]. To develop self-efficacy one needs a more collaborative and independent learning that does not demand too much from the student [49].

Self-efficacy has three aspects: i) Magnitude, referring to the belief about the level of difficulty that can be overcome; ii) Generality, referring to the field of individual achievement; and iii) Strength, related to the strength of one's efficacy when meeting the demand from the task or problem. Self-efficacy can influence individual behavior in selecting which task to be categorized as easy and which to be categorized as difficult. With high self-efficacy then the learning process will be better and later will have an effect on learning achievement. The presence of self-efficacy will make a student believe and ready to attend the class and complete tasks and responsibilities given by the teacher [63]. The student's readiness in learning process will make it easier for the student to attend the class and faster to adjust the knowledge. The student's readiness in the learning process is an important factor that the student has to have in facing the teaching and learning activities, considering that learning activities will be successful if the students have a high level of readiness, both in relation to knowledge and skill [64].

The results of this study are supported by a result of the previous study in which online learning that combines synchronized and unsynchronized settings has a significant effect on the learning process. The method that combines synchronized and unsynchronized settings has a different effect from online learning [55]. Learning that combines face-to-face method and online learning has a positive effect on learning [56]. Therefore, it can be said that with a combined method the learning process will run more effectively. Based on the previous explanation, it can be concluded that blended learning with the combined synchronized and unsynchronized settings have a positive effect on self-efficacy and the students' learning achievement in basic design. The group of students who learned through blended learning with combined synchronized and unsynchronized settings will achieve better than those who learn through a synchronized setting.

This study showed that the self-efficacy and learning achievement of the students who learned through blended learning with combined synchronized and unsynchronized settings were higher than the self-efficacy and learning achievement of those who learned with an unsynchronized setting. Thus, the approach in the learning process is one of the factors that have an effect on the learning achievement and self-efficacy of the students at 4 vocational schools in Bali: SMKN 2 Singaraja and SMKN 3 Denpasar as experiment classes and SMKN 1 Seririt and SMKN 4 Denpasar as control classes.

The finding of this study has some implications such as: Firstly, the result of the study showed that there is an effect of blended learning with the combined synchronized and unsynchronized settings on the students' self-efficacy and learning achievement. In an effort to enhance the quality of learning achievement and self-efficacy blended learning with the combined synchronized and unsynchronized settings can be employed. Blended learning with the combined synchronized and unsynchronized settings is an integration of face-to-face online learning with the aid of Zoom meeting or Google Meet which is combined with learning through social media in the form of WhatsApp and email. This combination of settings complements each other in such a way that the blended learning process can be implemented optimally and the students can develop self-efficacy.

The presence of blended learning with the combined synchronized and unsynchronized settings will enable the students to learn more actively and develop their self-confidence since they are ready to attend the class. Different from the synchronized setting in which the learning is done only by using Google Meet or Zoom meeting, although this learning process makes the students active to learn, if they are not supported by learning facilities the process will not run well. The learning process is limited by the time so that the teacher cannot teach quickly. and if the learning process continuously uses Zoom Meeting or Google Meet in a long time it will cause boredom in the students.

Secondly, the result of the study showed that blended learning with the combined synchronized and unsynchronized settings can enhance basic design learning achievement. This is not separable from the learning model used with the combined settings and media as well as the devices used. The students will become comfortable in the learning process and this helps them very much to understand the materials being learned. This is because the students can show the result of the tasks that they have done. Since the students learn without being bound by the place and time and their works will be directly confirmed and they can show the result of their works. With such condition such learning will develop the students' motivation to learn. With a high motivation, the learning process will also take place well and the students will understand the materials more deeply, which will directly have an effect on their learning achievement. Thus, it can be said that blended learning with the combined synchronized and unsynchronized settings can be employed to improve learning.

4. CONCLUSION

This study concluded that blended learning with the combined synchronized and unsynchronized settings has a positive effect on basic design learning. This cannot be separated from the strengths of the method used. With the combination method used the students no longer feel bored with a monotonous use of a method, and with a good combination of methods the weaknesses of each method can be eliminated so that a good method can be developed. With this combination method there will occur good interactions between the students and their peers, between the students and the teacher and the students and the learning resources.

This study shows that basic design learning achievement of the students who were taught with blended learning with combined synchronized and unsynchronized settings can enhance self-efficacy and learning achievement. Hence, blended learning with a collaboration between synchronized and unsynchronized settings should be socialized and developed further among the teachers, students, and other educational practitioners as an alternative to approaches to learning. The socialization and developmental process of blended learning with combined synchronized and unsynchronized settings can be held at *Musyawarah Guru Mata Pelajaran/*MGMP meetings (forum for teachers who teach the same subject) or instructional training can be run. Further research related to blended learning with combined synchronized and unsynchronized settings with different materials and courses can be done. In addition, there is also a need to conduct research that applies the LMS platform. Other variables (the effects of intelligence, interest, motivation, self-concept) that form the inseparable parts from the students on the development of the blended learning with combined synchronized and unsynchronized settings need to be investigated which later will have an effect on learning achievement.

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