The Effect of Blended Learning Models and Creative Thinking Ability on Learning Design Results

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Abstract: *This study aims to determine the learning outcomes of student learning design taught by using the online blended learning model with a computer blended learning model, knowing the learning outcomes of learning design of students who have high creative thinking ability compared to low creative thinking ability and knowing whether there is interaction between models bended learning and the ability to think creatively in influencing student learning design learning outcomes. The results showed that the average student learning design learning outcomes taught with the blended learning web learning model was higher than using the blended learning computer model, the average learning design outcomes of students who had high creative thinking ability were higher than the ability to think creatively low, and there is an interaction between the bended learning model and the ability to think creatively in influencing the learning outcomes of student learning design.*

Keywords: learning models, blended learning, creative thinking ability, learning design.

1. Introduction

The development of the advancement of Information and Communication Technology today was rapid, so it was fitting that experts call this symptom a revolution. Even though the progress was still on its way, since now it can be estimated that there will be various changes in the field of information and other related fields of life, as an implication of the development of these conditions. Changes - future and ongoing changes, mainly due to the potential and capabilities of information and communication technologies that enable humans to interact and meet their needs for information almost without limits. Some of the limitations that were experienced by humans in dealing with each other, such as distance, time, number, capacity, speed, etc. can now be overcome by the development of various advanced information and communication technologies.

With the presence of ICT in the field of education, it was now possible to hold distance learning by using internet media to connect students with their lecturers, view student grades online, check finances, view class schedules, send assignment files given by lecturers and so on , all that can be done. The main factor in distance learning which has been considered a problem was the lack of interaction between lecturers and students. However, with internet media it was very possible to interact between lecturers and students in the form of real time or not. In real time help can be done for example in a chatroom, direct interaction with real audio or real video and online meetings. Non-real-time interactions can be done by mailing lists, discussion groups, newsgruop and bulletin boards.

Learning developed tends to combine conventional learning with ICT-based learning. Learning that combines conventional learning with information and communication technology-based learning was what was developed as mixed learning or better known as Blended Learning, which combines conventional learning with learning by utilizing information and communication technology. Through Blended Learning the learning system becomes more flexible and not rigid.

The blended learning terminology was originally used to describe courses that tried to combine face-to-face learning with online learning. When the term blended learning becomes popular, more and more combinations are referred to as blended learning. However, the notion of blended learning based learning was learning that combines the strategies of delivering learning using face-to-face activities and computer-based learning, through the internet and mobile learning.

Blended Learning was a learning method that combines two or more methods and approaches in learning to achieve the objectives of the learning process. According to Thorne [1] that what happens in a conventional class where educators and students meet directly, with online learning that can be accessed anytime and anywhere. The other forms of blended learning are virtual meetings between educators and students. Where they allow to be in a different world, but can give each other feedback, ask questions, answer, interact between students with educators or between students and students.

Thorne's opinion [2] indicates, that blended learning was a combination of multimedia technology, CD ROM video streaming, virtual classes, voicemail, email and telephone conferences, online text animation and video-streaming. All of this was combined with the traditional form of training in one-on-one classes and training. Blended learning was the most appropriate solution for the appropriate learning process not only with learning needs but also with a learning style. According to Bersin [3] Blended learning was the combination of diffrent training of media (technologies, activities, and types of events) to create an optimum training

program for a specific audience. The term (blended) mean that traditional instructional-led training was being supplemented with olther electronic formats. There are many different forms of e-learning in the book for blended learning programs, such as complementary instructional training in orthher live formats.

In line with blended learning there are relevant results of Aly's research [4], namely research that takes an empirical view on three different areas of learning comparisons, namely (1) face to face, (2) online and (3) blended learning in introductory material Managerial Accounting. Where this study compares the results of midterm, final examinations and the number of final grades of students in the course taught by the same instructor using blended learning, face-to-face, and online media use.

Won and Yong's research [5] stated that the level of satisfaction of students with blended learning played an important role. Therefore the focus of his research was on the main factors that influence student satisfaction in a blended learning environment. There are six dimensions, namely (1) students, (2) instructors, (3) institutions, (4) technology, (5) design and (6) environment, which are indicators of student satisfaction especially in the e-learning component in a blended learning environment . Where in the study it was concluded that students (young generation) prioritized design dimensions to be the most important factor in their satisfaction with e-learning components in a blended learning environment. Therefore, it may be more strategic for educational institutions to emphasize the design dimension in their e-learning implementation in a special blended learning environment for younger students.

Based on the understanding and advantages of blended learning above, the results of Yamanto's research [6] show that the development of blended learning models was able to improve student learning outcomes and more easily understand the material through traditional learning and using e-learning. The conceptual model of blended learning was a learning model that uses interactive CD media and e-books in the learning process, and at the same time was an alternative learning to improve students' learning independence in package C program on PKBM [7].

The blended e-learning approach requires new ability so that learners can absorb as much as possible from the lessons given. Martyn [8] said that a successful e-learning blended environment consists of one fully face-to-face meeting, weekly online assignments accompanied by online communication (consultation), e-mail, and closed with one final examination in the form of face to face or written tests in class with the help of supervisors. Thus, learners will have more opportunities to develop themselves and be responsible for themselves [9], improve their social competence, increase student self-confidence [11], improve information-gathering ability and achieve achievements [2]. In addition, the teacher will also appreciate the various differences in the style and speed of learning that each student has and encourage communication, both between students themselves and between students and teachers [12] [13].

1.1 The Nature of Blended Learning

Grammar Blended Learning consists of two words, Blended and Learning. The word Blend means "joint mixture to improve quality to improve", or the formula for a combination of combinations or combinations [14], while Learning has a general meaning, namely learning, thus briefly means learning patterns that contain elements of mixing, or merging between one pattern with other patterns. The question was what was mixed? It was intended that conventional learning was usually done in classrooms combined with learning done online both independently and collaboratively, using information and communication technology infrastructure.

Figure 1: Blended Learning Concept
(Source: http://orangecharterschool.org/the-future-of-learning-has-arrived-at-ocs/)

Blended Learning has other terms that are often used, including Blended e-Learning and hybrid learning. The term mentioned above contains the same meaning, namely combination, mixing or combination of learning. To more easily understand the differences in these terms, Mainnen [15] which states "Blended learning has several alternative names, namely mixed learning, hybrid learning, Blended e-learning and melted learning (Finnish)." Because this mixed learning model was more using blended e-learning in face-to-face or residential learning and visiting tutorials, the authors use the term Blended e-learning. In addition Heinze [16] also believes "A better term for" Blended Learning "was " blended Blended e-learning "."

Blended Learning can be interpreted as a learning process that utilizes a variety of approaches. The approach taken can utilize various kinds of media and technology. In simple terms it can be said that Blended Learning was learning that combines face-to-face (conventional learning, where between students and educators interact directly, each can exchange information about teaching materials), independent learning (learning with various modules). provided) and self-study online.

The application of Blended Learning does not just happen. Some things are taken into consideration, namely the characteristics of the learning objectives that we want to achieve, relevant learning activities and choosing and determining which activities are relevant to conventional and which activities are relevant for online learning.

1.2 The Nature of Learning and Learning in the Blended Learning Model

The discussion of the blended learning learning model cannot be separated from the discussion about learning and learning. In educational psychology, learning was defined as a process that unites cognitive, emotional, and environmental influences and experiences to obtain, enhance, or make changes to one's knowledge, ability , values, and worldviews [17][18]. Learning as a process focuses on what happens when learning takes place. An explanation of what happened was learning theories. In learning theory it was described how people and animals acquire knowledge, process it, and then produce that knowledge as part of behavior.

Learning theories generally pay attention to the trends in how the learning process was carried out by students. Learning theory was also related to the existence of a knowledge structure. There are three conceptions of knowledge structure, (1) knowledge structure must be able to simplify a very broad information, (2) the structure must be able to bring learners to new things, beyond information that learners explain (3) knowledge structures must be able to expand horizons think learners, combine it with other sciences.

Learning theory was also related to optimal relationships. A learner must be able to find an easy relationship about something that will be taught so that students more easily capture that information. In this regard, teaching and learning activities are developing rapidly by involving technology. The word technology always has various connotations, ranging from hardware only to problem solving methods, to definitions by economists John Kenneth Galbraith: "The systematic application of scientific or other organized knowledge for practical tasks" [19]. Definition of learning technology by leading professional associations in the field: "theory and practice of design, development, utilization, management and evaluation of processes and resources for learning" [20]. Products such as computers, CD players, and space shuttles are a type of technology, which is called learning technology when used for learning purposes.

ICT as part of technology science now has a strategic role in learning and learning theory. ICT products that are now an important learning element are the internet and website. One of the most recent learning theories that has received much attention from education experts and practitioners was the Meaningful Learning Theory initiated by Ausubel [21]. Ausubel learning theory was one of the many learning theories that form the basis of mild learning.

Information processing theory was a cognitive theory of learning that explains the processing, storage, and retrieval of knowledge from the brain [22]. This theory explains how a person obtains some information and can be remembered for a long time. Therefore, it was necessary to apply a certain learning strategy that can facilitate all information processed in the brain through several senses. Information processing states that students process information, monitor it, and develop strategies related to that information. The essence of this approach was the process of memory and thinking [23]. Children gradually develop the capacity to develop to process information, and gradually they usually get complex knowledge and expertise. Information processing initially used a computer system as analog. The use of computer systems as analogous to the way humans process, store and recall information was actually not right because it oversimplifies human beings. The way humans process information was actually more complex than computers. Robert Siegler describes three main characteristics of the information processing approach, namely: thought processes, mechanisms for self-modification and modification [24].

Blended learning was used to describe a learning situation that combines several delivery methods that aim to provide the most effective and efficient experience [25] [26]. The combination in question can be in the form of a combination of several types of teaching technology, such as video, CD-ROM, film, or the internet with face-to-face teaching conducted by lecturers / educators. Singh [27] refers to this as blended e-learning. From the perspective of course design, this type of blended teaching can be between fully face-to-face teaching and online learning. Kerres and De Witt [28] propose a 3C framework for instructors who want to design blended learning, which includes content. And construction.

1.3 ICT Based Blended Learning

In line with the development of ICT (Information, Communication and Technology), various online learning models emerged. Next comes the term web-school or internet-based school, which uses internet facilities as its manager. Starting from the two terms, new situations arise in learning that use the internet, such as online learning, distance learning, web-based learning, e-learning. This makes a lot of people confused by the term.

Tsai and Machado [29] provide definitions based on the terminology approach to these terms, namely, "Our approach to defining these terms involves two complementary methods. The terminology was analyzed based on the individual meaning of the constitution of terms, and the meaning of related concepts. "Based on these definitions, each of the above terms can be explained as follows: (1) E-learning was mostly related to activities that involving computers and interactive networks simultaneously. That was , computers do not need to be central elements in activities or provide learning content, but computers and networks must hold a large involvement in learning activities; (2) Online learning was connected with content that was ready to be accessed on a computer. Such content may be on the Web or the internet, or only installed on a CD-ROM or computer hard disk; (3) Distance learning involves interaction at a distance between instructors and students, and allows timely instructor reactions to students. Simply posting or broadcasting learning material for students was not distance learning. Instructors must be involved in receiving feedback from students; and (4) Web-based learning was related to learning material delivered in a Web

browser, including when material was packaged on CD-ROM or other media.

Learning that uses ICT applications (computers and the internet) was known as Blended Learning. This Blended Learning model appears when Kerres and Witt [30] state that web-based learning can be combined with face-to-face learning. Definini Web-based learning has been explained before, meanwhile according to Alessi and Trollip [31] face-to-face learning or web-based courses or on-site learning was learning to use web learning resources face-to-face between learners and learners who are conducted in classroom.

Blended learning has many definitions that have many similarities or use common isit, which was the word combining. These definitions can look like below): (1) Combining instructional modalities (or delivery media); (2) Combining instrusctional methods; and (3) Online combining and face to face instruction. The third definition according to Graham [32] more accurately reflects the history of combining the blended learning system and was the foundation that he will work on, namely "Blended learning systems combine face-to-face instruction with computer-mediated instruction". According to Graham blended learning has two types of learning environments, namely there are traditional face-to-face learning environments that are still used around rural areas; and a distributed learning environment that has begun to develop along with new technologies that allow expansion to distribute communication and interaction.

The urgency of e-learning for future education institutions printing education staff will be even higher. Prospective educators are expected to have the competencies needed to be able to use technology in the learning process and integrate it in various lessons. Various efforts in developing countries such as in Indonesia have also been intensively carried out to encourage increasingly intensified mastery of technology in learning. Even in some developing countries such as Egypt, with USAID's assistance, teachers have been accustomed to making IT-based learning units and developing online networks that allow teachers to give input to each other in preparing lesson plans and exchanging information in general [33].

1.4 Learning Design

Learning design was a procedure that consists of steps, in which the steps in it consist of analysis, designing, developing, implementing and assessing learning outcomes [34]. This was also stated by Morisson, Ross & Kemp [35] who defines learning design as a systematic design process to create more effective and efficient learning, and make learning activities easier, which was based on what we know about theories learning, information technology, systematic analysis, research in education, and management methods. The purpose of a learning design was to achieve the best solution in solving problems by utilizing a number of available information. Thus, a design arises because of the human need to solve a problem at hand.

According to Morisson, Ross & Kemp [36] there are four basic components in learning design planning. These four represent the following questions: (1) For whom was this program created and developed? (characteristics of students or teaching participants) Whatever the learning design and subject matter delivered, it was necessary to know that what was actually done by the designers was creating a conducive learning situation so that learning objectives can be achieved and participants learn to feel comfortable and motivated in the learning process. Learning design must refer to participants learning. Each learning participant was a unique individual and needs to be considered in designing a learning design. Things that need to be considered for the aspects of learning participants include the general characteristics of participants, socio-cultural environment, initial competence, or prerequisites, learning styles and many others; (2) What do you want students or participants to learn? (purpose) The design and design of learning was to achieve the set learning goals, the purpose of learning was to fulfill or achieve certain competencies. The formulation of learning objectives was developed based on the competencies that must be possessed by students if he finishes studying. Learning design needs to integrate the needs of students with competencies that he must master later after completing learning; (3) What kind of learning content was the best to learn? (learning strategies) Methods related to learning strategies that should be designed so that the learning process runs smoothly. Methods are methods or techniques that are considered accurate for delivering teaching material. In learning design this step was very important because this method determines the real learning situation. On the other hand, the expertise of a learning designer can also be seen in the way he determines this method. The method as an ordinary learning strategy was associated with media, and the time available for learning. In this simple concept, methods are a simple component of learning strategies; and (4) How do you measure the learning outcomes that have been achieved? (evaluation procedure) This concept assumes that evaluating student learning outcomes was very important. Indicators of the success of achieving a learning goal can be observed from the assessment of learning outcomes. Often the assessment was measured by the ability to correctly answer a number of objective questions. Assessment can also be done in a non-question format, namely by observation instruments, interviews, questionnaires, and so on.

Learning design was a systematic development of learning specifications using learning and learning theory to ensure the quality of learning. The design and development process includes all the processes of analyzing learning needs, objectives and system development to achieve the objectives. development of learning materials and activities, trials and evaluations of all student learning and activities. Learning design was an activity to maximize effectiveness, efficiency and learning outcomes and other learning experiences. These activities include determining the initial situation, the needs of students, determining the final destination and creating several treatments to help in the transition period. In another

section explained the design of learning was the development of systematic teaching that was used specifically learning theories to ensure the quality of learning. Gagne [37] states that learning design was structured to help students learn, the learning process has current stages and long-term stages. Shambaugh in [38] describes the design of learning as follows. An intellectual process to help educators analyze learners' needs and build various possibilities to respond to those needs. A more specific opinion was expressed by Gentry and Csete [39], that the design of learning was concerned with the process of determining learning goals, strategies and techniques for achieving goals and designing media that can be used for the effectiveness of achieving goals.

From some of the above meanings, it can be formulated that learning design was the development of systematic learning to maximize the effectiveness and efficiency of learning. Learning design activities begin by analyzing the needs of students, determining learning objectives, developing learning materials and activities, which include the determination of learning resources, learning strategies, learning steps, learning media and assessment (evaluation) to measure the success rate of learning. The evaluation results are used as a reference to determine the level of effectiveness, efficiency and productivity of the learning process.

Learning Design Model. There are many models of learning design developed by many experts, and the realm of learning design was an area that was much in demand by experts in the field of education and training. One of the most common models of learning design that was widely known among learning designers was the procedural model of Dick and Carey [40]. This model was widely used by curriculum developers. This model suggests that the application of the principle of learning design was adjusted to the steps that must be taken sequentially.

There are other models based on learning activities, where this model combines learning design with classroom management activities or learning interactions. The model that was quite well-known and widely used was the model of learning design from Gagne [41] which was often referred to as 9 event of instruction. As follows: (1) Stimulation to gain attention to ensure the reception of stimuli; (2) Informing learners of learning objectives, to establish appropriate expectations; (3) Reminding learners of previously learned content for retrieval; (4) Clear and distinctive presentation of material to ensure selective perception; (5) Guidance of learning by suitable semantic encoding; (6) Eliciting performance, involving response generation; (7) Providing feedback about performance; (8) Assessing the performance, involving additional response feedback occasions; and (9) Arranging variety of practice to aid future retrieval and transfer.

The learning design model of this learning activity guides a teacher / lecturer how to manage or create the right learning interactions.

1.5 Creative Thinking Ability

Creative thinking was a mental activity that produces something new as a result of development. This was consistent with the opinion of Coleman and Hammen in [42] that "Creative thinking was a mental activity to increase the purity and sharpness of understanding in developing something". The ability to think creatively with regard to the ability to produce or develop something new, namely something unusual that was different from the ideas produced by most people. According to Potur & Barkul [43] defines creative thinking was an original cognitive ability and a problem-solving process that allows individuals to use their intelligence in a unique way and directed towards a result. This original cognitive ability emphasizes a person's cognitive abilities to create something unique that was different from what others have.

According to de Bono [44] The ability of students to think creatively allows students to obtain many ways or alternatives to solving a problem. Although sometimes too many ways will make it difficult to the final results, but with so many choices it will enable students to reach the goal compared to students who really have no way to get to the solution to the problem. Therefore creative thinking was very important in a student. Creative thinking was the key to thinking about designing, solving problems, making changes and improvements, gaining new ideas. Whereas according to Al-Khalili [45] a creative person was able to give us a new thought on the problems he faces or we face, both related to daily life or related to practical studies. Through creative thinking, students are expected to be able to solve their problems in daily life creatively.

The ability to think creatively emphasizes several indicators. Siswono [46] there are three indicators of creative thinking, namely fluency, flexibility and novelty. Creative students in thinking to solve problems are one of the goals that must be achieved from mathematics. Creative thinking was original and reflective thinking and produces a complex product in mathematical problems. Thinking involves the synthesis of ideas, building new ideas and determining their effectiveness. In addition, creative thinking was also related to the ability to make decisions and produce new products. Krulik [47] which defines creative thinking as original thinking and produces a complex result, which includes formulating ideas, generating new ideas, and determining their effectiveness. The ability to think creatively was an ability related to creativity which can be interpreted as a way of thinking to change or develop a problem, see a situation or problem from a different side, open to a variety of ideas and ideas that are not even common.

According to some experts such as Semiawan, Munandar, Supriadi, Silver, Sriraman in [48] provides almost the same explanation in understanding creativity. According to Munandar and Supriadi that creativity was analyzing four dimensions, namely Person, Product, Process, and Press. First, creativity as a person illustrates an individual with a unique mind or expression. Second, creativity as a product was a new, original, and meaningful creation. Third, creativity as a process reflects ability in thinking which include: fluency / fluency, flexibility, originality, and

elaboration. Fourth, creativity as a press was an internal or external condition that encourages the emergence of creative thinking.

Munandar [49] states that the characteristics of creativity can be divided into two, namely cognitive and non cognitive characteristics. The cognitive characteristics (aptitude) of creativity consist of originality, flexibility, fluency and elaborative. Whereas non-cognitive non-aptitude features of creativity include motivation, personality, and creative attitude.

Creative students in thinking to solve problems are one of the goals that must be achieved from mathematics. Creative thinking was original and reflective thinking and produces a complex product in mathematical problems. Thinking involves the synthesis of ideas, building new ideas and determining their effectiveness. In addition, creative thinking was also related to the ability to make decisions and produce new products. Krulik [50] which defines creative thinking as original thinking and produces a complex result, which includes formulating ideas, generating new ideas, and determining their effectiveness. Sriraman [51] says creativity as the ability to produce new or original works, about mathematical creativity as a process that has unusual and insightful solutions to certain problems, regardless of the level of complexity. This understanding shows that creative thinking was a process that was used to bring in or bring forth a useful new idea that previously had never existed.

According to Khodijah [52] thinking was to train ideas in the right and careful way that starts with the problem. Creative thinking can be interpreted as thinking logically and diverging to produce new ideas or ideas. The product of creative thinking itself was creativity.

King, Goodson, & Rohani [53] that high-level thinking ability include critical thinking, logical, creative, reflective, and metacognitive. Creative thinking was thinking that provides new perspectives or seizes new opportunities so that new ideas emerge that have never existed [54]. In line with this, creative thinking according to Yusmanida [55] was the ability to see various answers to one problem. From this opinion, it was known that the more ways to solve a problem, the more creative someone was with a note that the answers produced are still in accordance with the questions given. So the quantity of answers and the quality of the way of solving, determine someone was said to be creative.

The ability to think creatively uses the reference made, Munandar [56] who argues that creative thinking ability are formulated as abilities that reflect aspects as follows: (1) Think fluently or smoothly which causes a person to be able to spark lots of ideas, answers, solving problems or questions ; (2) Flexible thinking or flexibility that causes a person to be able to produce varied ideas, answers or questions; (3) Original thinking that causes a person to be able to produce new and unique expressions or be able to find unusual combinations of ordinary elements; and (4) elaborating ability that cause a person to be able to enrich and develop an idea.

The formulation of the research problem was : (1) are the learning design outcomes of students taught by using the blended learning model through online web higher than students taught by using the blended learning model through computers ?; (2) Are the learning design learning outcomes of students who have high creative thinking ability, higher than students who have low creative thinking ability ?; and (3) whether there was an interaction between the bended learning learning model and the ability to think creatively in influencing the learning outcomes of student learning design.

2. Method

This research was carried out automotive engineering education study program, Odd semester. The research population was automotive engineering education students who took teaching planning courses, which consisted of 3 classes, and each class consisted of 105 students, which meant the population of the study consisted of 70 students. While the study sample was set in 2 classes with techniques. The study design was a factorial 2x2 experiment. The learning strategy was divided into two, namely the blended learning learning model and the expository learning model. The ability to think creatively was also divided into two, namely the ability to think creatively

Data collection techniques in this study were in the form of questionnaires and written tests given to students before and after treatment in both classes. The validity of the instrument in this study included the validity of rational judgment by consulting instruments to experts in this case the supervisors and other lecturers who were competent by being asked for their opinion on the instruments that had been prepared. After the instrument has been consulted and has fulfilled the requirements, then the next step will be a trial in the field to obtain the construct validity. After the data was obtained and tabulated, then testing construct validity was done by factor analysis. The second test was a test to measure critical thinking ability . To test the validity carried out using biserial correlation. While the reliability test was done using K.R-20

Data analysis techniques are carried out using descriptive and inferential statistics. Descriptive technique was to describe data. While inferential techniques are to test hypotheses. The data analysis technique was carried out by steps: (1) testing the analysis requirements with the normality test using the Kolmogorov-Smirnov method for homogeneity testing carried out by the levene test, and (2) testing the hypothesis in this study for the hypothesis using the Anava F test and continuing in further testing.

3. Result

The results of this study are presented in Table 2. as follows:

Table 1: Summary of Data Results of Calculation of Descriptive Analysis

Creative Thinking Ability	Blended Learning Model		Total
	Computer (offline) (A_1)	*Web (Online)* (A_2)	

Creative Thinking Ability		Blended Learning Model		
		Computer (offline) (A₁)	*Web (Online)* (A₂)	Total
High (B₁)	N	13	14	27
	∑X	287	248	535
	X̄	52,32	56,52	54,42
	S	2,65	2,54	5,19
Low (B₂)	N	14	15	29
	∑X	394	324	718
	X̄	28,32	27,53	27,93
	S	3,43	2,57	6
Total	N	27	29	56
	∑X	681	572	1253
	X̄	80,64	84,05	164,69
	S	6,08	5,11	11,19

Overall the results of Anava calculations for hypothesis testing can be seen in Table 2 below:

Table 2: Summary of Factorial ANOVA 2 X 2

Variation Sources	dk	JK	RJK	F_{count}	F_{table}	Re-marks ($\alpha = 0,05$)
Blended Learning Model (A)	1	28,45	28,45	7,56	4,03	Sig.
Creative Thinking Ability (B)	1	214,55	214,55	68,34	4,03	Sig.
Interaction (AxB)	1	429,26	429,26	28,64	4,03	Sig.
Intergroup	3	238,85	-			
Error	50	294,5	6,57			
Total	56	1205,61				

Based on the results of data calculations, it can be seen that students taught using the blended learning learning model with computers obtain an average value = 80.64, while the learning outcomes of student teaching planning taught with the online blended learning web learning model obtain an average value = 84 , 05. Furthermore, based on the results of data calculations, it can be seen that students who have high creative thinking ability obtain an average value of teaching planning learning outcomes = 54.42, while learning design learning outcomes of students who have low creative thinking ability score an average = 27.93 .

The results of the analysis of variance for the two learning approaches showed that the Fh price of 7.56 was greater than the Ft price of 4.03 at a significant level α = 0.05 so that Ho was rejected at a significant level α = 0.05. Thus it can be concluded that the student group taught using the online web blended learning learning model obtained higher learning design learning outcomes from the group of students who were taught with the blended learning learning model with the computer being verified.

The results of the analysis of variance for both the blended learning model show that the fh price of 7.56 was greater than the Ft price of 4.03 at a significant level of α = 0.05 so that Ho was rejected at a significant level α = 0.05. Thus it can be concluded that there are differences in learning design learning outcomes of students who learn to use the blended learning model through online web with a computerized blended leaning learning model. Next to the results of the analysis of variance for both creative thinking ability shows that the fh price of 68.34 was greater than the Ft price of

4.03 at a significant level α = 0.05 so that Ho was rejected at a significant level α = 0.05. Thus it can be concluded that there are differences in learning design learning outcomes of students who have high creative thinking ability with low creative thinking ability that are validated.

Based on the results of testing the above hypothesis obtained Fh = 28.64 and the critical value Ft = 4.03 with dk (1.50) at the level of α = 0.05. These results indicate that Fh = 28.64 > Ft = 4.03 so the hypothesis which states that there was an interaction between the use of the blended learning model and the ability to think creatively in influencing student learning design learning outcomes was validated.

Because there was an interaction between the blended learning learning model and the ability to think creatively in influencing the learning outcomes of student learning design, further testing (post hoc test) was needed to determine which sample learning outcomes are different. To see the form of interaction between learning strategies and personality types in influencing the learning outcomes of student teaching planning, further tests were conducted using the Scheffe Test. The results of calculations using the Scheffe Test can be seen in Table 3. as follows:

Table 3: Summary of Calculation Results of the Scheffe Test

No	Statistical Hypothesis	F_{count}	F_{table} ($\alpha = 0,05$)	Information
1	$H_0 : \mu A_1 B_1 = \mu A_2 B_1$	9,22	3,70	Significant
2	$H_0 : \mu A_1 B_1 = \mu A_1 B_2$	10,24	3,70	Significant
3	$H_0 : \mu A_1 B_1 = \mu A_2 B_2$	10,92	3,70	Significant
4	$H_0 : \mu A_2 B_1 = \mu A_1 B_2$	8,14	3,70	Significant
5	$H_0 : \mu A_2 B_1 = \mu A_2 B_2$	10,62	3,70	Significant
6	$H_0 : \mu A_1 B_2 = \mu A_2 B_2$	4,52	3,70	Significant

Acceptance criteria if $F_{count} > F_{table}$, then tested significantly. Based on the Scheffe test results in the table above it can be seen that there are 6 (six) pairs of statistical hypotheses, namely: (1) from the calculation results prove that $F_{count} = 9.22 > F_{table} = 3.70$, so that there are differences in learning outcomes of student learning design if taught using the blended learning model with online web on high creative thinking ability with blended learning learning models with computers that Having high creative thinking ability was proven; (2) from the calculation results prove that Fcount = 10.24 > Ftable = 3.70 so that there was a difference in student learning design learning outcomes if taught using the blended learning model with online web on high creative thinking ability with blended learning learning models with online web having low creative thinking ability was validated; (3) from the calculation results prove that $F_{count} = 10.92 > F_{table} = 3.70$, so that there are differences in learning outcomes of student learning design if taught using the blended learning model with online web on high creative thinking ability with blended learning learning models with computers that having low creative thinking ability was validated; (4) from the calculation results prove that $F_{count} = 8.14 < F_{table} = 3.70$, so that there are differences in learning outcomes of student learning design if taught using computer blended learning learning model on high creative thinking ability with blended learning learning model with online web

having low creative thinking ability was validated; (5) from the calculation results prove that $F_{count} = 10.62 < F_{table} = 3.70$, so that there are differences in student learning design learning outcomes if taught using a computer blended learning learning model on high creative thinking ability with blended learning learning models with computers that have low creative thinking ability was proven; and (6) from the calculation results prove that $F_{count} = 4.52 < F_{table} = 3.70$, so that there are differences in student learning design learning outcomes if taught using the blended learning model with online web on low creative thinking ability with blended learning learning models with computers that having low creative thinking ability was validated.

4. Discussion

The results showed that the creative thinking ability of students in the application of the blended learning learning model to the indicators of fluency was demonstrated by the ability to produce many ideas made in response to a command. Students are able to provide a variety of answers to problems that students make correctly. The indicator of flexibility appears in changes in approach when responding to commands. The flexibility of students in solving problems refers to the ability of students to solve problems in learning design that are designed in various different ways and produce diverse ideas in learning blended learning models. The indicator of authenticity in problem solving refers to the ability of students to answer problems with several different answers but it was true or an unusual answer made by individual students at the stage of their development or level of knowledge in developing learning plans.

The ability in planning blended learning in the preparation of lesson plans that are suitable for learning objectives to produce unusual ideas between most or rarely was to think about something that has not been thought of by people or was not the same as the thinking of people in general. In the indicator of assessing or reformulating the problem solving, students are able to test and revise continuously, as well as the ability to evaluate and explain and provide rational reasons for the solution steps and/or provide arguments regarding the formulas, principles and or theorems applied in the solution the problem was Students lacking the ability to think creatively on the indicators of decomposition in solving problems refers to the lack of skill in breaking down a problem in detail, thorough, precise and complete. This was because learning with the blended learning model requires students to look for information and materials in planning, learning that will be developed independently, so that a lot of knowledge was obtained by students and faster in understanding learning design subjects. Students are less able to draw complete and rational conclusions on learning activities that are designed through the planning they do and are less able to develop, embellish, and issue an idea in the planning of blended learning.

The low ability of students in aspects of creative thinking in the application of blended learning can be influenced by errors in the way students learn. Every individual has a different way of learning. Each person cannot be forced to follow one way of learning. But in reality many students are not aware of which learning style matches their personality. This learning style that was not suitable with the student's personality was what causes students to find it difficult if faced with complex and non-routine problems.

According to Hamruni [57], one alternative to improve students' thinking ability was to promote questions that can spur the thinking process. In this sense the concept of a problem or questions was used to bring up the "culture of thinking" in students. In encouraging student creative thinking, the teacher asks students to connect known information and task information that must be done in planning blended learning-based learning. Therefore, the existence of a blended learning learning model based on problems can help teachers fill their duties in improving their ability to think creatively. Indicators of creative thinking can be seen from divergent production which includes flexibility, authenticity and feasibility.

Problem-based blended learning learning model was a learning model that was carried out with the provision of stimuli in the form of problems which are then carried out by blended learning problem solving by students who are expected to increase student ability in achieving blended learning-based learning material.

The results of the study show that in problem-based learning authentic and relevant tasks or problems are represented which are represented through a context. The method aims to have students experience as they will face their professional lives. An important aspect in the blended learning model based on problems was that learning begins with problems that will determine the direction of learning. By presenting the problem as a springboard for blended learning, students are encouraged to seek information needed to solve problems. Here, the teacher presents the problem, guides and gives a few instructions to students in solving problems.

The results of this study are supported by Evans in [58] explaining that creative thinking was a mental activity to make relationships that are continuous, so that a "right" condition was found or until someone gives up. In this sense it was stressed about how a condition that was deemed true was found by linking information received using the knowledge possessed through blended learning. Because in this process it aims to find what was considered true that has not been known before, it can be said that this mental activity aims something new. Through the blended learning learning model, it was very helpful for students to construct thinking ability in mastering learning design and also related to the ability to think highly and can facilitate students in developing learning plans.

The results of the study were also corroborated by Siswono [59], that creative thinking was a habit of sharp thinking with intuition, moving imagination, revealing new possibilities, opening the veil of amazing ideas and inspiring unexpected ideas. In creative thinking, someone tends to have new ideas about things. These ideas are expressed in

creative ideas to solve a problem (problem) in planning learning through strategies which methods and use of learning media are emphasized. In this sense, intuition was interpreted as thinking of common sense in solving a problem without going through the steps of analysis. So students look for problem solving without knowing whether the formula used was right or wrong.

Students who have creativity besides him as convergent or intelligence thinkers (acquiring knowledge and skill development) as well as divergent thinkers who are able to combine elements in unexpected ways. As Rogers points out in [60] the three conditions of the creative person are: (1) Openness to experience. (2) The ability to assess situations according to one's personal standards. (3) The ability to experiment, to "play" with concepts. The description above can also be interpreted that in one's creative personality, if you already have personal and environmental conditions that support or environment that gives an opportunity to creatively busy themselves, creativity was predicted to emerge.

The purpose of education was to make children think creatively both to solve problems and to be able to communicate or convey their thoughts in the learning plan of the blended learning model. In fact, the application of learning to the blended learning model does not encourage students to think creatively. Two factors that cause creative thinking not to develop during education are curricula that are generally designed with broad material targets, so that educators focus more on completing material than on teaching methods that can improve their creative thinking ability [61]. In the ability to think creatively, creativity was the way to that ability. If someone has high creativity then it proves that he has the ability to think creatively. Like creativity was a product of good and right thinking. Whereas Munandar [62] states that creativity was the general ability to create something new, because of the ability to provide new ideas that can be applied to problem solving, or as the ability to know the relationship between existing elements.

The success of the learning process was inseparable from the teacher's ability to develop learning models that are oriented towards increasing the intensity of student involvement effectively in the learning process by applying the blended learning learning model. To be able to develop an effective learning model, each teacher must have adequate knowledge regarding the concepts and ways of implementing these models in the blended learning-based learning process. A teacher's lack of understanding of these conditions causes the blended learning learning model developed by the teacher to be inclined to not optimally enhance the student's role in learning, and ultimately cannot contribute significantly to the achievement of student learning outcomes [63].

Blended learning-based learning planning in the implementation of learning processes directly was learning that was done by confronting students on real problems in everyday life, so students can develop their own knowledge in solving problems and strive for various solutions, and encourage students to think creatively.

5. Conclusion

The conclusion of the results of this study are as follows: (1) the average learning design learning outcomes of students taught by using the blended learning model with web learning are higher than students taught by using the blended learning model through computers; (2) the average learning design learning outcomes of students who have high creative thinking ability are higher than students who have low creative thinking ability; and (3) there was an interaction between the bended learning learning model and the ability to think creatively in influencing the learning outcomes of student learning design.

For students with high creative thinking ability, it was more effective in improving learning design learning outcomes if taught with blended learning models through online web, while for students who have low creative thinking ability are more effective in improving learning design learning outcomes if taught with blended learning models via computer.

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