# THE EFFECT OF BLENDED LEARNING STRATEGY TO MATHEMATICAL PROBLEM SOLVING ABILITY: STATE UNIVERSITY OF MEDAN CASE

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## Abstract

This study aims to develop mathematical problem solving ability with implementing blended learning strategy. This research use a quasi-experimental research with independent variable is learning model; blended learning strategy and conventional learning. The dependent variable is mathematical problem solving skill of students. The subject of this research is the students taking the euclid and non-euclid geometry course in department of mathematics at state university of Medan. The experimental class was taught with blended learning strategy and the control class was taught with conventional learning. The instrument used consisted of: (1) mathematical problem solving ability test; (2) observation sheet. The instrument has been declared eligible content validity and has the reliability coefficient 0.91. Data was analyzed using analysis of variance (ANOVA). The results showed that there are differences in the increase mathematical problem solving ability among students who receive blended learning strategy and conventional learning strategy.

***Keywords***: blended learning, mathematical problem solving ability

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## A. INTRODUCTION

The Mathematics learning objectives include developing capabilities : (1) mathematical communication, (2) mathematical reasoning, (3) mathematical problem solving, (4) mathematical connection, (5) ) mathematical representation (NCTM, 2000: 7). Sumarmo (2005) termed these abilities as a *mathematical power* or *doing math.* Furthermore, Sumarmo said that through the mathematical skills (doing math). Furthermore, Sumarno said that through the above mathematical skills (doing math), expected to meet the needs of the students of the present and future needs of learners . The necessityof today's learners are students understand the concepts necessary to resolve the problems of mathematics and other sciences, whereas the needs of future students is students have the reasoning skills that are necessary in the life of society so that they can survive and compete with other nations. Thus, the learning of mathematics at the university is expected to develop mathematical ability of students to support the above objectives .

The demands of college besides demanding academic skills ( hard skills ) , students are also required to be able to improve their personal abilities ( soft skills ) , so it is ready to enter the real working world after completing the study, so they are ready to enter the real working world after completing the study. According to Dimyati (2000),

learning as interactive activities that should be able to work on all domains of cognitive , affective , and psychomotor as a follow- learning in the context of personal integrity learners. The interactive learning activities are expected to provide an opportunity to develop all of intelligence for academic achievement and personal competence of students. This means giving students the opportunity to wade across the domains of learning (cognitive , affective , and psychomotor ) , as well as develop the entire intelligence ( emotional , spiritual , social , and so on ). This relates to the Munandar's opinion (1999) which said that educational activities should be focused on the development of creativity and problem solving learners so that their children can meet individual needs , the needs of society and the needs of the country .

The goal has implications for the efforts to make mathematics interesting for students so that they become active and creative in the nextlearning. With active and creative learners to follow learning of mathematics , it is expected that it will have a positive effect on learning outcomes obtained.The learning result is reflected in mathematical communication skills , reasoning , mathematical creative abilities , as well as problem solving skills in mathematics and the problems they face everyday .

Soedjadi (1994: 36) said that the problem solving ability is a skill at self-learners to be able to use mathematical activities to solve problems in mathematics, problems in other science and problems in everyday life. Based on a variety of these opinions, problem solving skills needed to train students to be used to deal with problems in an increasingly complex life, not only on problems in mathematics itself but also problems in other subjects and problems in everyday life. Therefore , a person's ability to solve mathematical problems need to be trained so that one is able to resolve the various problems.

However, the reality has not been in accordance with what was expected , the learning of mathematics still tends to be oriented in a textbook, infrequently found a lecturer of mathematics still inscribed in habits taught using learning stepssuch as : presenting instructional materials , providing examples of problems and ask the students working on the exercises contained in the book they use in teaching and then discuss it with students. This method is certainly less able to develop a mathematical problem solving ability of students. The students can only work on math problems based on the example of lecturer, if given a different matter they would have difficulty in finish.

To develop creativity and problem-solving abilities of the students, it is required an acceleration in the process of learning mathematics, cause updating information often happens so fast. The presence of an acceleration , a student can have an insight into the

future direction wider. In the context of the acceleration , the role of technology is indispensable. UNESCO (Yaniawati, 2008) stated that the integration of telecommunications and information technology into learning has three objectives:( 1 ) building a " knowledge-based sociaty habits " ; ( 2 ) develop skills in using technology ( ICT literacy) ; and ( 3 ) improve the effectiveness and efficiency of the learning process .

One strategy that can be used in learning activities that involve face-to- face ( conventional ) and the use of technology is a blended learning strategy. Blended learning is a teaching strategy that integrates the traditional face-to- face learning and computer-based learning ( online and offline ) as well as a variety of communication options that can be used by faculty and students (Wasis, 2011).Blended learning can also facilitate various learning styles of learners , where each learner has different learning styles. Learning style is a combination of how learners absorb, organize and process information .The background of the different learning styles of each student participated into consideration blended learning strategy chosen in this study .

With a blended learning strategy , learners which need more time to absorb the material can re-learn it by the offline and online. The possibility to deliver learning in the form of text and images ( still or motion ) which often can not be implemented in face-to-face will provide easy to understand the material better through offline and online methods .

The above descriptions encourage research that focuses on the application of blended learning strategies to enhance problem solving skills of students in the mathematics department , State University of Medan .

## B. METHODS

The location of this research is the Department of Mathematics at the StateUniversity of Medan. The subject of research is the students who took the Euclid and Non- Euclidean Geometry Course in the academic year 2015/2016.

The independent variable in this study is a model of learning namely*Blended Learning* Strategy and conventional learning by lecturer. While the dependent variable was the mathematical problem solving skill of students .Data to be sought in this study was the test scores of mathematical problem solving ability of students. Previously, it was performed statistical tests to determine validation tests using Pearson product moment correlation test. The reliability level is calculated by the formula Alpha , distinguishing matter and difficulty level item. After that, the test score data mathematical problem solving ability of students will be analyzed descriptively. The hypothesis will be analyzed by analysis of variance one lane.

## C. RESEARCH RESULT

The data was collected consisted of pretest and posttest mathematical problems solving ability. The answer of the problem formulation in this study will be discussed in the descriptive mathematical problem solving learning of student before ( *pre-test* ) and after learning ( *post-test* ). Then, it willfind the differences in student mathematics problem solving strategic learning *blended learning* and *conventional instruction.*

### 1. Mathematical Problem Solving Ability Prior Learning

Based on data from the pretest results obtained mathematical problem solving ability the lowest score( ¡ $_{min}$ ),The highest scores( ¡ $_{maks}$ ), the average score( ¡ $_{ave}$) and standard deviation(s) for an experimental class and control class as shown in the table 1 below :

**Table 1.** Summary Average Test Scores Early Mathematical Problem Solving Ability Students

| Class | | The ability of understanding problem | The ability of problem solving Planing Strategy | The ability of implementation of Problem solving Planning Strategy | Aspect pretes |
|---|---|---|---|---|---|
| *Conventional instruction* | Mean | 1.34 | 1.24 | 1.20 | 1.17 |
| | Std. Deviation | .961 | .875 | .827 | 1.116 |
| | Minimum | 0 | 0 | 0 | 0 |
| | Maximum | 4 | 4 | 4 | 4 |
| *Blended Learning* | Mean | 1.40 | 1.56 | 1.36 | 1.11 |
| | Std. Deviation | .999 | 1.150 | .993 | 1.123 |
| | Minimum | 0 | 0 | 0 | 0 |
| | Maximum | 4 | 4 | 4 | 3 |

According to Table 1, it can be concluded that the average pretest students in the experimental class and control class is different for each indicator mathematical problem-solving abilities. For knowing the difference of the average pretest mathematical problem solving abilities between *blended learning*strategy and *conventional instruction* will be calculated normality and homogeneity pretest on each learning.

a) Normality Test: Pretest

To test the normality of the distribution of the population used the pretest scores normality test with a non -parametric statistical tests *One- Sample Kolmogorov - Smirnov*using SPSS 16at the level of 95 % or significance α = 0.05. The null and opponenthypothesis to be tested are:

$H_0$ :Samples come from populations with normal distribution

$H_1$ :Samples derived from the population distribution is not normal

The test criteria are : accept $H_0$ if the significance value > 0.05 .

The calculation result of normality mathematical problem solving ability pretest are presented in Table 2 below

**Table 2.** Normality Test of Mathematical Problem Solving Ability Students (Pretest)

| | | Kolmogorov-Smirnov[a] | | | |
|---|---|---|---|---|---|
| | Class | Statistik | Df | Sig. | Conclusion |
| Understanding Problem | Conventional | .268 | 40 | .000 | Not normal |
| | Blended Learning | .198 | 40 | .000 | Not normal |
| Problem solving Planning Strategy | Conventional | .266 | 40 | .000 | Not normal |
| | Blended Learning | .240 | 40 | .000 | Not normal |
| Implementation of Problem solving Planning Strategy | Conventional | .267 | 40 | .000 | Not normal |
| | Blended Learning | .215 | 40 | .000 | Not normal |
| Checking Answers | Conventional | .210 | 40 | .000 | Not normal |
| | Blended Learning | .268 | 40 | .000 | Not normal |
| The whole aspects pretest | Conventional | .095 | 40 | .197 | Normal |
| | Blended Learning | .098 | 40 | .091 | Normal |

a. Lilliefors Significance Correction

Table 2 it appears that all the indicator scores mathematical problem solving ability of students has a significance value less than 0.05 except for the whole aspects of problem solving mathematical abilities of students has a significance value greater than the significance level of 0.05. Because of all the indicator scores mathematical problem solving ability of students is not normal then to examine differences in the average pretest every indicator in the experimental class and the control class used *Mann Whitney* test. The summary of the calculation results of different test with Mann Whitney test are presented in Table 3 below:

$H_0$: There are no differences in the distribution of pre-test scores for each indicator experimental class with the control class

From table 3.3, the significant value pretest for every indicator is greater than the significance level of 0.05, so the null hypothesis that there is no difference in the distribution of pre-test scores for each indicator experimental class and control class accepted. The table 3.3 showed that the value of pretest for all aspects of indicator

in experimental class control class is normally distributed. Next, it will be tested whether the variance of the overall indicator pretest experimental class and control class is the same.

**Table 3.** The Test Results of Differences On averag Mathematical Problem Solving Ability Pretest

| Test Statistic | Understanding Problem – Blended Learning | Problem Solving Planning Strategi -Blanded Learning | Implementation of Problem solving Planning Strategy – Blended Learning | Checking Answer Blenden learning |
|---|---|---|---|---|
| Mann-Whitney U | 2344.000 | 2318.000 | 2046.500 | 2379.000 |
| Wilcoxon W | 4829.000 | 4803.000 | 4531.500 | 4864.000 |
| Z | -.465 | -.585 | -1.766 | -.310 |
| Asymp. Sig. (2-tailed) | .642 | .558 | .077 | .757 |

b) Homogeneity test : Pretest

The next step is to test the homogeneity of variance of data pretest scores. It is used homogenity of Variances Test ( *Levene Statistic* ) using SPSS 16 at the level of 95 % or significance α = 0.05.

$H_0 : \sigma_1^2 = \sigma_2^2$

$H_1 : \sigma_1^2 \neq \sigma_2^2$

with : $\sigma_1^2$ = variance of Blended Learning class

$\sigma_2^2$ = variance of control class

The test criteria:accepted $H_0$if $F_{hint}$ > 0,05. The summary of the results of homogeneity of variance test for pretest of mathematical problem solving ability of students experimental class and control class is presented in the following table:

Table 4 shows the significant value pretest in every aspect of mathematical problem solving ability of students is greater than the significance level of 0.05, so that the null hypothesis which states that there is no difference variance pretest scores on each aspect of the experimental and control class received. It can be concluded that the experimental class and control class for mathematical problem solving ability of students pretest have the same variance ( homogeneous ).

**Table 4.** Homogeneity of Variance Test Results Problem Solving Ability pretest Experiment Class and Class Controls

| | | Levene Statistic | df1 | df2 | Sig. |
|---|---|---|---|---|---|
| The ability of Understanding Problem | Based on Mean | 2.353 | 1 | 38 | .130 |
| | Based on Median | 2.445 | 1 | 38 | .123 |
| | Based on Median and with adjusted df | 2.445 | 1 | 36.312 | .123 |
| | Based on trimmed mean | 2.740 | 1 | 38 | .102 |
| The ability of Problem solving Planning Strategy | Based on Mean | .792 | 1 | 38 | .377 |
| | Based on Median | .645 | 1 | 38 | .425 |
| | Based on Median and with adjusted df | .645 | 1 | 32.755 | .425 |
| | Based on trimmed mean | .713 | 1 | 38 | .401 |
| The ability of implementation of Problem solving Planning Strategy | Based on Mean | 1.078 | 1 | 38 | .303 |
| | Based on Median | .120 | 1 | 38 | .730 |
| | Based on Median and with adjusted df | .120 | 1 | 37.217 | .730 |
| | Based on trimmed mean | .747 | 1 | 38 | .390 |
| The ability of Checking Answers | Based on Mean | 2.353 | 1 | 38 | .130 |
| | Based on Median | 2.445 | 1 | 38 | .123 |
| | Based on Median and with adjusted df | 2.445 | 1 | 36.312 | .123 |
| | Based on trimmed mean | 2.740 | 1 | 38 | .102 |
| The whole aspects pretest | Based on Mean | 2.195 | 1 | 38 | .143 |
| | Based on Median | 1.833 | 1 | 38 | .180 |
| | Based on Median and with adjusted df | 1.833 | 1 | 35.748 | .180 |
| | Based on trimmed mean | 2.037 | 1 | 38 | .158 |

**2. Mathematical Problem Solving Ability After Learning**

Based on data from the post-test results obtained mathematical problem solving ability the lowest score( ¡ $_{min}$ ),The highest scores( ¡ $_{maks}$ ), the average score( ¡ $_{ave}$ ) and standard deviation(s) for an experimental class and control class as shown in the table 5 below :

From table 3.5, it can be concluded that the post-test of students in the experimental class and control class is different for each indicator mathematical problem solving ability. But to ascertain the average difference postes creative mathematical abilities of students between learning strategy and conventional learning Blended Learning will be calculated normality and homogeneity post-test on each lesson .

**Table 5.** The Results Postes of Mathematical Problem Solving Ability

| Class | | The ability of understanding problem | The ability of problem solving Planing Strategy | The ability of implementation of Problem solbing Planning Strategy | The ability of Checking answer | The whole aspects posttes |
|---|---|---|---|---|---|---|
| *Conventional instruction* | Mean | 1.39 | 1.31 | 1.37 | 1.19 | 6.26 |
| | Std. Deviation | .873 | .790 | .920 | .982 | 2.811 |
| | Minimum | 0 | 0 | 0 | 0 | 1 |
| | Maximum | 4 | 4 | 4 | 4 | 12 |
| *Blended Learning* | Mean | 2.10 | 2.14 | 2.09 | 1.23 | 8.67 |
| | Std. Deviation | 1.144 | 1.243 | 1.201 | .981 | 2.333 |
| | Minimum | 0 | 0 | 0 | 0 | 3 |
| | Maximum | 4 | 4 | 4 | 4 | 12 |

a) Normality Test: Posttes

To test the normality of the distribution of the population used the post-test scores normality test with a non -parametric statistical tests *One- Sample Kolmogorov - Smirnov*using SPSS 16at the level of 95 % or significance α = 0.05. The null and opponenthypothesis to be tested are:

$H_0$ :Samples come from populations with normal distribution

$H_1$ :Samples derived from the population distribution is not normal

The test criteria are : accept $H_0$ if the significance value > 0.05 .The calculation result normality mathematical problem solving ability pretest are below

**Table 6.** Normality Test The Post-Test of Mathematical Problem Solving Ability Students

| | | Kolmogorov-Smirnov[a] | | | |
|---|---|---|---|---|---|
| | Class | Statistik | Df | Sig. | Conclusion |
| Understanding Problem | Conventional | .285 | 40 | .000 | Not Normal |
| | Blended Learning | .206 | 40 | .000 | Not Normal |
| Problem solving Planning Strategy | Conventional | .269 | 40 | .000 | Not Normal |
| | Blended Learning | .164 | 40 | .000 | Not Normal |
| Implementation of Problem solving Planning Strategy | Conventional | .228 | 40 | .000 | Not Normal |
| | Blended Learning | .172 | 40 | .000 | Not Normal |
| Checking Answers | Conventional | .204 | 40 | .000 | Not Normal |
| | Blended Learning | .192 | 40 | .000 | Not Normal |
| The whole aspects pretest | Conventional | .103 | 40 | .062 | Normal |
| | Blended Learning | .101 | 40 | .074 | Normal |

Table 6 shows that all the indicator scores mathematical problem solving ability of students has a significance value less than 0.05 except for the whole aspects of problem solving mathematical abilities of students has a significance value greater than the significance level of 0.05. Because of all the indicator scores mathematical problem solving ability of students is not normal then to examine differences in the average pretest every indicator in the experimental class and the control class used *Mann Whitney* test. The summary of the calculation results of different test with Mann Whitney test are presented in Table 7 below.

**Tabel 7.** The Test Results of Differences On average Mathematical Problem Solving Ability Post-test

| Test Statistic | Understanding Problem – Blended Learning | Problem Solving Planning Strategi -Blanded Learning | Implementation of Problem solving Planning Strategy – Blended Learning | Checking Answer Blenden learning |
|---|---|---|---|---|
| Mann-Whitney U | 1564.500 | 1504.500 | 1593.000 | 18384.000 |
| Wilcoxon W | 4049.500 | 3989.500 | 4078.000 | 4869.000 |
| Z | -3.876 | -4.117 | -3.703 | -2.288 |
| Asymp. Sig. (2-tailed) | .000 | .000 | .000 | .008 |

$H_0$: There are no differences in the distribution of post-test scores for each indicator experimental class and the control class. Table 7 shows that the significance value less than the significance level of 0.05, so that the null hypothesis is rejected. In other words, there are differences in the average post-test score for each indicator between the experimental class and control class .

In Table 6, the post-test value of the whole aspects in experimental class and control class have a normal distribution. Next step, it will be tested whether the variance of the whole aspects post-test in experimental class and control class is the same.

b) Homogeneity Test: Post-test

The next step is to test the homogeneity of variance of data post-test scores. It is used homogenity of Variances Test ( *Levene Statistic* ) using SPSS 16 at the level of 95 % or significance α = 0.05.

$H_0 : \sigma_1^2 = \sigma_2^2$

$H_1 : \sigma_1^2 \neq \sigma_2^2$

with : $\sigma_1^2$ = variance of Blended Learning class

$\sigma_2^2$ = variance of control class

The test criteria:accepted $H_0$ if $F_{hint} > 0{,}05$. The summary of the results of homogeneity of variance test for pretest of mathematical problem solving ability of students experimental class and control class is presented in the following table.

**Tabel 8.** Homogeneity of Variance Test Results Problem Solving Ability Post-test Experiment Class and Class Controls

| | | Levene Statistic | df1 | df2 | Sig. |
|---|---|---|---|---|---|
| The ability of Understanding Problem | Based on Mean | .125 | 1 | 38 | .725 |
| | Based on Median | .092 | 1 | 38 | .763 |
| | Based on Median and with adjusted df | .092 | 1 | 37.112 | .763 |
| | Based on trimmed mean | .120 | 1 | 38 | .730 |
| The ability of Problem solving Planning Strategy | Based on Mean | 3.092 | 1 | 38 | .083 |
| | Based on Median | 3.229 | 1 | 38 | .077 |
| | Based on Median and with adjusted df | 3.229 | 1 | 36.244 | .077 |
| | Based on trimmed mean | 3.021 | 1 | 38 | .087 |
| The ability of implementation of Problem solving Planning Strategy | Based on Mean | .500 | 1 | 38 | .482 |
| | Based on Median | .057 | 1 | 38 | .812 |
| | Based on Median and with adjusted df | .057 | 1 | 37.993 | .812 |
| | Based on trimmed mean | .569 | 1 | 68 | .453 |
| The ability of Checking Answers | Based on Mean | .000 | 1 | 38 | 1.000 |
| | Based on Median | .045 | 1 | 38 | .832 |
| | Based on Median and with adjusted df | .045 | 1 | 35.722 | .832 |
| | Based on trimmed mean | .028 | 1 | 38 | .868 |
| The whole aspects pretest | Based on Mean | .028 | 1 | 38 | .867 |
| | Based on Median | .031 | 1 | 38 | .861 |
| | Based on Median and with adjusted df | .031 | 1 | 37.629 | .861 |
| | Based on trimmed mean | .015 | 1 | 38 | .904 |

Table 8 shows the significant value post-test in every aspect of mathematical problem solving ability of students is greater than the significance level of 0.05, so that the null hypothesis which states that there is no difference variance pretest scores on each aspect of the experimental and control class received. It can be concluded that the experimental class and control class for mathematical problem solving ability of students pretest have the same variance ( homogeneous ).

Furthermore, to see the differences in mathematical problem solving ability of students will be calculated using the Anova one-line test. Anova test calculations using SPSS 16 at the level of 95 % or significance of α = 0.05 to test the hypotheses H0 and H1 as follows

$H_o : «_{PMA} = «_{PMB}$

$H_1 : «_{PMA} \neq «_{PMB}$

The test criteria: Rejected $H_0$if Sig. < 0,05 (Wijaya, 2011). The summary of the results of calculations anava one-lane test of the difference mathematical problem solving ability of students in the experimental class and control control are presented in Table 9 below.

**Table 9.** The Results of Anova Test for Mathematical Problem Solving Ability In Experiment Class and Class Controls

| | | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| The ability of Understanding Problem | Between Groups | .322 | 1 | .322 | 5.448 | .021 |
| | Within Groups | 8.147 | 78 | .059 | | |
| | Total | 8.468 | 80 | | | |
| The ability of Problem solving Planning Strategy | Between Groups | .573 | 1 | .573 | 8.917 | .003 |
| | Within Groups | 8.875 | 78 | .064 | | |
| | Total | 9.448 | 80 | | | |
| The ability of implementation of Problem solving Planning Strategy | Between Groups | .129 | 1 | .129 | 2.672 | .005 |
| | Within Groups | 6.662 | 78 | .048 | | |
| | Total | 6.791 | 80 | | | |
| The ability of Checking Answers | Between Groups | .091 | 1 | .091 | 1.573 | .212 |
| | Within Groups | 7.988 | 78 | .058 | | |
| | Total | 8.079 | 80 | | | |
| The whole aspects | Between Groups | .411 | 1 | .411 | 8.243 | .005 |
| | Within Groups | 6.889 | 78 | .050 | | |
| | Total | 7.300 | 80 | | | |

Some things that can be inferred from table 9, among others, namely :

a. Scores mathematical problem solving ability of studentswith $F_{hint}$ = 5,448 and Sig 0,021 < 0,05, so $H_0$ rejected and $H_1$ received. In other words, there are differences in

mathematical problem solving ability of students in aspects of understanding ability between the blended learning classand conventional class.

b. Scores mathematical problem solving ability of studentswith $F_{hint}$ = 8,917 and Sig 0,003 < 0,05, so $H_0$ rejected and $H_1$ received. In other words, there are differences in mathematical problem solving ability of students in aspects of Problem solving Planning Strategy ability between the blended learning classand conventional class.

c. Scores mathematical problem solving ability of studentswith $F_{hint}$ = 2,672 and Sig 0,004 < 0,05, so $H_0$ rejected and $H_1$ received.In other words, there are differences in mathematical problem solving ability of students in aspects of implementation of problem solving planning strategy ability between the blended learning classand conventional class.

d. Scores mathematical problem solving ability of studentswith $F_{hint}$ = 1,573 and Sig 0,212 < 0,05, so $H_0$ received and $H_1$ rejected.In other words, there are not differences in mathematical problem solving ability of students in aspects of checking answers ability between the blended learning classand conventional class.

e. Scores mathematical problem solving ability of studentswith $F_{hint}$ = 8,243 and Sig 0,005 < 0,05, so $H_0$ rejected and $H_1$ received.In other words, there are differences in mathematical problem solving ability of students in the wholeaspects between the blended learning classand conventional class.

**D. DISCUSSION**

In general, the learning approach blended learning strategy can be implemented by lecturer. Implementation of learning , because of the various supporting factors, such as the availability of adequate learning devices such as syllabus , learning contract and lesson plan which has been equipped with a learning scenario that includes the anticipation of didactic and pedagogical. In addition, the trial also held teaching and discussion between students and researchers prior to the study . It is intended to prepare for the implementation of learning in accordance with the lesson plan that has been prepared.

The results obtained through this study is that it turns the implementation of blended learning strategies in the learning of mathematics have influenced the students problem-solving capabilities. This was shown by testing hypotheses states that there are significant differences between mathematical problem solving ability of students , who acquire learning blended learning strategy with mathematical problem solving ability of students who obtain regular learning .

## E. CONCLUSION

Based on the analysis , findings and discussion that has been explained in the previous chapter, this section will put forward the following conclusions :

a. Application of learning blended learning strategies in the learning of mathematics has contributed positively to the increase in mathematical problem-solving skills in all aspects of the skills tested.

b. Mathematical problem solving abilities that learned by the blended learningstrategy is better than the mathematical problem solving abilities that learned by conventional strategy for the aspects of understanding capabilities, The ability of Problem solving Planning Strategyand implementation of Problem solving Planning Strategy , but not better on the capability of checking back an answer .

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