

PROBING PROMPTING TECHNIQUE ASSISTED BLENDED LEARNING VIEWED FROM TRIALS AND KAM ON THE ABILITY OF PROBLEMS AND UNDERSTANDING MATHEMATIC STUDENTS IN UNIVERSITY PGRI PALEMBANG

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Abstract

This study aims to examine the extent of test results and initial ability of students (KAM) on the ability of Mathematical Problem Solving (KPMM) and mathematical understanding (KPM) of students through Probing Prompting learning techniques. Probing methods developed with Prompting are as follows: The teacher exposes the student to a new situation, for example by looking at pictures, formulas or other situations that contain problems. Waiting for a moment to give the students an opportunity to formulate an answer or conduct a small discussion in formulating it, The teacher asks students to match the specific learning objectives (TPK) or indicators to all students, waiting for a moment to give the students an opportunity to formulate an answer or conduct a small discussion in formulating it. In the face-to-face study dikuliah Differential Equation, assisted blended learning is by using the internet online. This research uses test class and also see KAM that is student ability early on high level, medium and low. The subject of this research is a mathematics student at PGRI University of Palembang. Based on the results of the analysis seen the results of tests on indicators of problem-solving skills and students' mathematical understanding, as well as the initial ability (KAM).

Keywords: Probing Prompting, Blended Learning, Problem Solving and Understanding

INTRODUCTION

Mathematics learning which is used as research at PGRI University of Palembang in the course of Differential Equation by using probing prompting technique. Probing prompting by Marmo and Idris (2008) is a digging question for obtaining further answers from existing answers aimed at improving the quality of the first answer, resulting in clearer, more accurate and reasonable answers. In the event that students can not answer or misrepresent, the teacher asks follow-up questions that will guide the thinking process of the students, so that in the end the students can find answers to the 4 questions. This probing technique can be used as a technique to improve the quality and quantity of student answers. Probing Prompting Technique in Suherman (2008) is learning by way of presented on a series of questions that are guided and explored so that there will likely be a process of thinking that links previous knowledge and experience with new knowledge to be learned.

The study used experimental learning in the form of experimental research because of the treatment in the test and measured its effect on the sample groups. In the implementation, random sample grouping is not done, but accepting the subject state as it is. Thus this research method is Quasi-Experimental (Ruseffendi, 2005; Sugiyono, 2009; Sukmadinata, 2008). However, this study is only just an early stage discussed in the trial and sharing of KAM from test classes that divide the ability of low, medium and high. To obtain information and control equality The initial ability of research subjects, used pretes. If there are differences in postes scores from the sample groups it can be expected due to different treatment or not. Therefore, the experimental design used in the study was the design of pretest and post-test control group (Nonequivalent Pre-Test and Post-Test Group-Control) (Creswell, 2012; Sugyono, 2009). Students' initial ability (KAM) is differentiated into 3 groups ie high, medium, and low.

Population and Sample

Class College Student	Sum (People)
2A	36
2B	34
Sum	70

Population Research

Selects 2 experimental classes by purposive sampling taking into account the time efficiency, cost, and research preparation. The classes chosen by purposive sampling are class A and B.

Examine the equivalence of the selected classes of classes A and B by describing the quality of KAM in those classes to be defined as experiments (bled learning probing prompting learning) and control class (conventional learning). Data obtained KAM by Viewing from semesteran student value in semester four semester, where researcher once give problem trigonometry at PDP year 2017 hence Descriptive statistic of TKAM score data based on study sample class presented in table 1.

Table 1 Data Descriptive Statistics of TKAM

Class research	Sample	Score		Average	Standart Deviation	N
		Min	Maks			
A		4.80	9	7.661	0.98395	36
B		4.80	9	7.4	1.08432	34

Based on the above table, the average standard deviation of each probing prompting class is not the same. Next, it will be statistically tested whether the mean of the

two sample classes is significantly equal (same). Before performing the average difference test, normality and homogeneity test of variance of both groups of data were first tested. Normality test using Kolmogorov-Smirnov (K-S) test, while homogeneity test of variance using Levene test. To summarize the results of normality test dat TKAM presented in the table and homogeneity test results in the table below.

Table 2 Normality Test of TKAM Data Based on Sample Class

Class research	N	K-S	Sig	H0
A	36	0.195	0.001	Rejected
B	34	0.250	0.000	Rejected

Table 3. Homogeneity TKAM Data Test Based on Sample Class

Class research	F	Sig	Ho
A	0.934	0.337	Accepted
B			

From the table can be seen the probability value (sig) data TKAM class A and B smaller than the significant level of 0.05, so H0 rejected. This means the data is not normally distributed. For homogeneity test it is known that TKAM data is also greater than 0.05 significance level, it also means that this does not mean because the normality test has shown that the data is not normally distributed. Thus, because the data is not normally distributed and homogeneous, then to know the equivalence of the average class A and B are used non parametric statistic that is test of mann-whitney test with hypothesis as follows. a summary of mann whitney test results can be in the following table.

Table 4. Mann-Whitney Test

Class research	N	Sig	Ho
A	36	0.360	Accepted
B	34		

The table shows that the sig value. Greater than the 0.05 significance level, so H0 is accepted. That is, there is no significant difference in the mean of TKAM data of sample class A and B. This result gives the conclusion that the students in both research sample classes A and B have the same initial student ability. Specifies the class that will be the experiment class and control class. The selection was done randomly from two classes of samples from two classes of research samples that were class A and B. Based

on the random results of the class A was selected as experimental class and class B as control class.

RESULTS AND DISCUSSION

The student's early ability (KAM) is the mathematical ability that the students have before the lesson in this research is carried out. TKAM aims to determine the equality of students' ability in learning probing prompting and conventional learning, but it is also used for student placement. TKAM used by jayanti (2017) which has been tested for its validity and reliability. Based on this TKAM score, students are grouped into 3 groups (T), medium group (S), and low group (R).

To classify the students into three groups (high, medium, low), the grouping criteria based on the average score (\bar{x}) and standard deviation (s) according to Arikunto (2012) can be seen in Table 5 and the student distribution in each class based on KAM can be seen in the table below:

Table 5 Descriptive Statistics of TKAM Data based on Class Sample Research

Class research	Sample	Sum	Low ability	Moderate Ability	High Ability
A (Eksperimen)		36	4	24	8
B(Kontrol)		34	9	21	4

Test Results In Mathematical Problem Solving Tests (TKPMM)

In the experimental class to measure the validity of a question, a test is needed to see the student's early ability (KAM). According Kesumawati (Chotimah, 2014) the ability to solve mathematical problems is the ability to identify the elements that are known, asked, and the adequacy of the necessary elements, able to create or arrange mathematical models, can choose and develop solving strategies, able to explain and verify the answers obtained . Meanwhile, according to Dahar (2011) argued that problem solving is a human activity that combines the concepts and all the rules that have been obtained before, and not as a generic skill. According to Arthur (2008: 1) problem solving is part of thinking. As part of thinking, problem-solving exercises can improve thinking skills as high-level cognitive processes that require more modulation and control than routine or basic skills. Stacey (2005) in Kurniawan (2012) suggests that the ability of understanding is one of the factors which is given to the contribution and is determined from the success of the learner in itself in solving the problem.

On the question of KPMM test Before being used, the problem of mathematical problem solving abilities first in validation by the balancer consisting of 3 people, 2 experts in mathematics education and 1 lecturer trigonometric course lecturer after the validation and revision of the TKPMM was tested.

Certain types of test statistics that match the problem. Testing all hypotheses using SPSS 18 for Windows software.

Validity test

Validity is a measure that indicates the extent of validity or validity of an instrument (Arikunto, 2010: 211). The formula of correlation that can be used is by Product Moment correlation formula with rough numbers, namely:

$$r_{xy} = \frac{N \sum XY - (\sum X)(\sum Y)}{\sqrt{\{N \sum X^2 - (\sum X)^2\} \{N \sum Y^2 - (\sum Y)^2\}}} \quad (\text{Arikunto, 2012:87})$$

After the r_{xy} price is then consulted to the Product-Moment price criticism table, if $r_{xy} > r_{tabel}$ means valid and vice versa if $r_{xy} < r_{tabel}$ means invalid (Arikunto, 2012: 89). With the tenth number of questions tested in 36 students and validated by several validators, the test results of the tested instruments to measure the level of mathematical problem solving ability and mathematical reasoning are presented in the following table:

Table.6. Test Result Intrument Test Capture Mathematical Problems on Probing Promting Learning

Number Question	r_{count}	r_{tabel}	Validity
1a	0,460		Valid
1b	0,468		Valid
2a	0,572		Valid
b	0,489		Valid
3	0,499		Valid
4a	0,713	0,329	Valid
4b	0,620		Valid
4c	0,601		Valid
4d	0,549		Valid
4e	0,606		Valid

From the table above it can be seen that from the six tested questions the results turn out to be number 1, 2, s / d 10 valid and at 5% significant level so it is concluded that the number of questions 1, 2, s / d 10 is feasible to use.

Test Reliability

Reliability relates to trust issues. A test can be said to have a high level of confidence if the test can provide a fixed result (Arikunto, 2012: 100). In this research, test reliability test shape test by using Alpha formula is as follows:

$$r_{11} = \left(\frac{n}{n-1} \right) \left(1 - \frac{\sum \sigma_i^2}{\sigma^2} \right) \quad \text{where} \quad \sigma^2 = \frac{\sum X^2 - \frac{(\sum X)^2}{N}}{N} \quad (\text{Arikunto, 2012:122-123})$$

Reliable test data criterion, consulted with r tabel price in table Product-Mom r values, if $r_{hitung} > r_{tabel}$ dengan $\alpha = 0,05$ then the instrument is reliable (Sugiyono, 2010: 357).

Table 7 Test Reliability Results Tests

No	Varians Score	Varians Total	r_{11}	r_{tabel}	Criteria
1a	0,472				
1b	0,552				
2a	0,944				
b	0,645				
3	0,667	26,1381	0,755	0,329	Reliabel
4a	1,021				
4b	0,722				
4c	1,472				
4d	0,842				
4e	1,021				

Difficulty Level

According to Arikunto (2012: 222), a good question is a matter that is not too easy or not too difficult. The formula for finding the difficulty level of essays is:

$$P = \frac{B}{JS} \quad (\text{Arikunto, 2012: 223})$$

Table 8. Classification Of Index Test

Indeks Difficulty (P)	Categori of question
0,00 to 0,30	hard
0,31 to 0,70	Medium
0,71 to 1,00	Easy

The test results of the instrument consisting of questions can be seen in the following table:

Table 9 Level Of Test Rate

Number Question	Koefisien Difficulty Level	Criteria
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1a	0,278	Hard
1b	0,648	Medium
2a	0,556	Medium
b	0,574	Medium
3	0,667	Medium
4a	0,639	Medium
4b	0,667	Medium
4c	0,611	Medium
4d	0,620	Medium
4e	0,583	Medium

Distinct Power

Arikunto (2012: 226), says that "The power of difference is a matter of ability to distinguish between clever students (high-ability) with stupid (low-ability) students". The formula used to determine the distinguishing power:

$$D = \frac{B_A}{J_A} - \frac{B_B}{J_B} = P_A - P_B \quad (\text{Arikunto, 2012:228})$$

Table 10 Classification Of Different Power Criteria Test

Interval	Criteria
0,00 – 0,20	Ugly
0,21 – 0,40	Enough
0,41 – 0,70	Good
0,71 – 1,00	Very Good

The results of differentiating power calculations are presented in the following table:

Table 11. Results of Power Diversity Tests

No.	Koefisien Diversity Test	Criteria
1a	0,259	Enough
1b	0,222	Enough
2a	0,259	Enough
b	0,296	Enough
3	0,241	Enough
4a	0,389	Enough
4b	0,370	Enough
4c	0,556	Good
4d	0,315	Enough
4e	0,481	Good

The results of the analysis in the Table above shows that the question of TKPMM has met the characteristics that are sufficient to be used in the research.

Mathematical Understanding Math Test (TKPM)

Understanding the concept is the main thing that must be mastered by the next students ie problem solving and communication. Understanding means process, deed, way of understanding or comprehending (KBBI, 2008) in Herdian (2010). Understanding the concept is the form of explanation of a number of learning materials, where students are not just know and know, but able to express the concept in the form more easily understood and able to apply it (Rosmawati, 2008: 5). Not just transfer knowledge to students, but mathematics learning is able to help students inculcate math concepts correctly. Before being used, the question of KPM test was validated first by 3 people, ie 2 experts in mathematics education and 1 lecturer of subjects of Differential Mathematics Equation 1. After being validated, the TKPM was tested in a limited manner to 36 students outside the research sample, which has received the material tested. To obtain student TKPM data, a scoring of student answers is made.

Data of cona test result about TKPM and calculation of validity of test item item, reliability, distinguishing factor, and difficulty level are in Table 12 below.

Table 12. Test Results Instruments Test Capability Of Mathematical Degree

No.	r_{count}	r_{tabel}	Validity
1a	0,571		Valid
1b	0,619		Valid
2a	0,720		Valid
2b	0,552	0,329	Valid
3a	0,538		Valid
3b	0,534		Valid
3c	0,463		Valid

Table 13 Results Test Reliability Test

No.	Varians Score	Varians Totale	r_{11}	r_{tabel}	Ket	Criteria
1a	0,775					
1b	1,138					
2a	1,006	14,604	0,645	0,329	Reliabel	High
2b	0,664					
3a	0,934					

3b	0,823
3c	0,799

Table 14 Level Of Tes Test Rate

No.	Koefisien Level Test Rate	Criteria
1a	0,648	Medium
1b	0,657	Medium
2a	0,593	Medium
2b	0,648	Medium
3a	0,602	Medium
3b	0,602	Medium
3c	0,583	Medium

Table 15. Result Of Power Design Test

No.	Koefisien Power Design Test	Criteria
1a	0,315	Cukup
1b	0,389	Cukup
2a	0,426	Baik
2b	0,296	Cukup
3a	0,241	Cukup
3b	0,204	Cukup
3c	0,241	Cukup

The results of the analysis in Table below, show that the TKPM has met the characteristics adequate for use in research.

Observation is used to obtain an overview of the atmosphere and the quality of the lecturing process and the activities of the students during the course of learning, which in blended learning learning using the internet and also during the interview, is used as supporting data to complete the observation and interviews, and as an evaluation material to know the advantages and weaknesses during the learning process takes place.

CONCLUSION

In this research, it can be seen that the test result and student's early ability (KAM) on Mathematical Problem Solving (KPMM) and mathematical comprehension (KPM) of students through Probing Prompting learning technique. Basically Probing method developed with Prompting namely: The teacher exposes the student to a new situation, for example by paying attention to pictures, formulas, or other situations that contain problems. Waiting for some time to give opportunity to student to formulate answer or do small discussion in formulating it, Lecturer ask problem to student according to Special Learning Purposes in class or indicator to all student, Wait a moment to give opportunity to student to formulate answer or do discussion small in formulating

it. In the face-to-face learning carried out in the eyes of the class of Differential Equations in class 4A which uses blended learning that is using the internet online. This research uses test class and also see KAM that is student ability early on high level, medium and low. The subject of this research is a mathematics student at PGRI University of Palembang.

Based on the result of the analysis, the result of the test on the indicators of problem solving ability and mathematical understanding of the students showed valid and reliable results to be used in subsequent research, as well as the initial ability (KAM) seen how the ability of students clustered on the initial ability of low, medium and high. So from the results of all trials in the class, this study can be continued at the next level .

Acknowledgments

The researcher expressed his gratitude to the Minister of Research, Technology and Higher Education who has sponsored this research through the newbie lecturer scheme for Fiscal (PDP) Year 2018 Kemenristek DIKTI and also To all parties who have helped in the success of this research, so that it can be completed on time

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