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The Effectiveness of Problem Based Learning on Achievement and Students Higher Order Thinking Skills in Malay Language Essay Writing

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Abstract--- *The purpose of this study is to look at the effectiveness of Problem Based Learning (PBL) towards achievement and Higher Order Thinking Skill (HOTS) students in Malay writing. This study focuses on critical thinking skills, problem solving skills, decision making skills and reasoning skills. This study uses the pre-test post-test control group design. The subjects were 54 students from two classes of form 3 in Sekolah Menengah Kebangsaan Agama, Melaka. 28 students participated as the treatment group where teaching and learning process was held in a classroom. The other 26 students identified as the experiment group were taught using PBL. There were eight hypotheses presented. The inference statistic used t-test to assess the hypotheses and to answer the questions that arise in the study. The findings showed that two null hypotheses were accepted. However, the other six hypotheses were rejected. Acceptance of the null hypothesis indicates that there was no significant difference in the achievement of pre-test for both the control group and treatment at an early stage. Rejection null hypothesis suggests that there are differences in the achievement of pre and post test for both the experimental and control groups. The implications of this study showed that the teaching and learning uses PBM effective because it can improve student achievement in writing Malay Language simultaneously improve student HOTS.*

Keywords--- *Problem Based Learning, Higher Order Thinking Skill, Essay.*

I. INTRODUCTION

In daily routine, thinking is a very important thing. Us always encouraged by many parties such as teachers and parents to think. Thinking skills is something that can be developed. There are some who say the school plays an important role in producing the next generation of students think best. Thinking skills is something that is very useful for lifetime. Therefore, thinking skills children need to be fully developed as early as college.

Accordingly, the education system at Malaysia puts more emphasis on thinking skills and problem solving. Malaysian Education Development Plan PPPM 2013-2025 (MOE, 2013) outlined six aspirations and one of them is thinking skills so that every student can compete at the level (MOE, 2014). That thinking skill emphasized by the MOE is a high level thinking skill. Thinking skills have become one from the major elements of the education system

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in an effort to improve development student intellect. This aspect of thinking skills has entered as explicit and implicit elements to in the curriculum as well as in teaching and lessons.

HOTS (Higher Order Thinking Skills) is defined as the ability to apply knowledge, skills and value in reasoning and reflection for solve problems, make decisions, innovation and the ability to create something (MOE, 2013). The education system has been around for a long time Malaysia has introduced a deep thinking element school curriculum but the implementers are just that implicitly. In an era of economic competition and great industry today, skills think explicitly emphasized for encourage students to have competition critical thinking, innovative, imaginative and creative (Saemah & Zamri, 2016).

State education aims at develop intellectual and spiritual power to maximum rank. The development of intellectual power and the spirituality of the younger generation is essential because they are a contributor to energy country work. High level thinking is needed by the community to compete in all fields. Developing country have a good workforce. Time the future of a country depends on human resources no longer depend on a natural resource like in the past. Therefore, the educated generation, high quality and quality the prosperity and progress of a person country. Musliha (2010) in his study expresses the ability to think critically creative, problem solving and creating decisions are very important to the individual to work well. A capable worker thinks creatively, solve problems, make decisions and act logically are workers who have the opportunity good in his career. Their situation has high level thinking skills much better than those just to have the knowledge and skills basis. Therefore, thinking skills need to be learned for students to be in their future always ready to face any form challenging issues with action and the right solution.

Each individual is capable of mastering the HOTS, those skills should be polished through learning, experience, time and exercise. Individuals who master the skills think capable and skilled in management effective mind (Zamri, 2018). Management mind training individuals sharpen and broaden our systematic thinking as well thinking independently without any help from other people. Saemah and Zamri (2016) argue well-thought-out individuals have a better chance at it manage life, improve achievements and can extend life more easily and meaningfully. There are many ways to relate in the context of learning active, learning is no longer a process standard, but transformed into a shape customized problem solving skills, critical thinking and learning to learn developed (Zamri, 2015). One of the models that helps students practice solving the problem is Problem-Based Learning (PBL). This model is an approach authentic problem learning (real) so that students are able to organize his own knowledge, expanding high skill and inquiry as well enhancing self-confidence (Murphy, 2004). For PBL models, teachers play a role in ask questions, ask questions, provide support and encouragement in student research.

PBL is designed to provide students with real-life situations to learn to solve real-world problems through a series of activities and investigations based on theories, concepts, and principles learned, help students develop their thinking skills and communication needed to succeed (Elias, 2015). Problems that are not structured in the PBL can improve the cognitive processes of students accompanied by a good review (Jamilah, 2016). By this method, the real-world problems that are relevant and meaningful offered to students. Students actively work in groups to solve problems, communicate, argue for the best and only teacher responsible way facilitates the activities of the

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construction of student knowledge. Teachers focus on helping students achieve self-learning skills. This method encourages active learning and foster critical thinking, open and reflection (Jamilah, 2016) to build knowledge, students can also find out why they learn and what they learn (Chin and Chia, 2004).

In the PBL model, students should responsible for the learning process that they manage and don't depend too much on to the teacher. PBL make students versatile that can continue the process of learning about their lives and careers. The role of the teacher is only as facilitator or tutor that guides students through the process education (Jamilah, 2016; Alias, 2015). When students become more efficient in the process learning, facilitators will increase reduced its activation. Learning process the PBL is formed from the complex of problems that exists in the real world. That's it encouraging students to learn to integrate and manage the information obtained so it can be applied to finish problems to be faced. The problem is the design of the PBL is challenging to learn more to develop critical thinking skills and ability solve problems effectively.

II. PROBLEM STATEMENT

Thought skills were long introduced as critical and creative thinking skills. In Malaysia, the skills of thinking and creative have been given emphasis since Re-formulation of Integrated Secondary School Curriculum (KBSM) in 1998. In 2013, HOTS was introduced as Continuity of critical and creative thinking skills. Time Education This is more focused on the five HOTS elements, which is to apply, analyse, evaluate and they create. Ability to think about Encourage students to test the truth Things or problems so that they do not constitutes the conclusion or wrong decision in addition to the ability to process Information and produce something new. Students should think critically, too, can be said to be actively involved in Process of thinking with evaluating, analysing or Interpreting information. Its skill Think critically; this is stressed by the teacher in every teaching and learning.

However, most teachers give less attention to critical thinking skills students because they are too focused on effort to spend the syllabus and mastery of technique answers to exam questions. This is supported by the Saemah and Zamri studies (2016) found that development teaching that incorporates thinking skills in in the classroom is still at that level less favourable. Teaching is not as a mere memorization technique but should use thinking skills. An issue is also emphasized in the studies of Zamri and Nor Razah (2011) states that in context R&D, the questioning is capable of encouraging effective teacher-student interaction. Question submitted by the teacher should effective and able to guide students give you a clear and expanding idea potential thinking students. Then, be teacher's responsibility to guide and educates students towards learning based thinking skills.

Troubleshooting skills involve Ability to identify and analyse Problems in a complex and fuzzy situation, making justification in evaluations, capable develop thinking skills like analyse, explain and evaluate discussion and ability to trigger ideas for finding solutions. Skills solving problems among students in Malaysia is still at a lower level satisfactory. This is evidenced by the results of PISA 2012: Creative Problem Login Solving (Students Skill in Tackling Real Life Problems) found in Malaysia occupying the 39 From 44 countries in solution testing Problem (MOE, 2013). Review by Aida Suraya et al. (2006) demonstrated the ability of students in solving problems is still

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not satisfactory. It was supported by Sabri (2008) which Expressing the most important skill key in jobs is a thought skill. Hence, students should prepare themselves with thinking skills because these skills are in increasing productivity.

Composing skills are said to be the highest skills in skills level language and most synonymous with subjects Malay Language. Essay writing process is the hardest skill to Dominated (Nik Safiah, 2004) as compared to the other language skills. The weakness in writing are a source of student failure is achieving a good result in the exam. Students ' achievement in Malay Language essay is still at satisfactory scores. Students are still weak in relating an important content with a title given. Due to lack of contents, students fail to make an accurate and relevant explanation. There are also students who submitted their content with the vague and less obvious. This weakness students are unable to produce good essay and thus affect their scores. Based on a review by Simah (2009), many students especially non Malays are at least satisfying levels in the writing of the fact type, while in the narrative, most students achieve satisfactory score. Domination writing skills can also help strengthen the use of languages containing the aesthetics values as available in writing of factual compositions, narrative, poetry, and so on. However, failure in master writing skills resulting the students having a difficulty to state messages in writing (Nurul Aisyah et al., 2016). Therefore, students need to obtain exposure and understand a good writing techniques in school.

Most of the teacher's teaching is currently still using traditional methods which are lecture methods. Effects of centre in teaching makes the students lazy to think and will fail in making results, solve problems and contradictory. Zamri (2014) states the practice of teaching in the classroom with less emphasis on strategy thinking skills such as advocacy methods, discussion and discovery. Process of traditional learning shows that high-level thinking skills have been ignored. There is no active interaction between students that make it difficult for troubleshooting. Students also do not collaborate and strive to generate ideas through thinking skills in achieving troubleshooting. If this situation continuous school will not be able to produce an intellectual and state student will be lacking capable workforce and higher skilled skills that can increase competition with foreign countries.

The ability of traditional approach to prove a competitive student often disputed in tandem with the changes in innovation in education. Traditional approaches that teacher-centred causes students to be Passive in teaching and learning. Students are just listening a teacher's lecture and notes, as well as lack of application in thinking skills. Creative thinking among students has been a necessity to ensure students able to dominate and fully organize their knowledge. Thus, PBM approaches in helping for student to learn and apply for what they had learned in easily, quickly and effectively.

III. PURPOSES OF STUDY

This study intends to:

1. Identify whether there is a significant difference in the performance of pre-test between the experimental group and the group control.

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2. Identify whether there is a significant difference in the achievement of post-test between the experimental group and the group control.
3. Identify whether there is a significant difference in the performance of pre-test and post-operative testing of the experimental group.
4. Identify whether there is a significant difference in the performance of pre-test and post-test of the control group.
5. Identify whether there is a significant difference in-level high thinking skills among students of experimental group taught by using a method PBM with the students of control group taught using conventional method.

IV. METHODOLOY

1) Design of Study

This study is intended to observe a response on the effects of using PBL for students' achievement and form 3 student's essay writing in learning Malay Language. Therefore, the form was designed in this study is quasi-experimental. Two equivalent student group is divided in two groups. First group is taught by using PBL technique (group Experiments) and second group is taught by using the conventional method (group Control).

2) Population and Sample

The population of study consists of student in form 3 from secondary school national religious in Malacca, Malaysia. Random sampling method was implemented in this study. Random sampling method was intended to be selected on focused in reviewing that increase in achievement and HOTS is implement through PBL methods in essay writing. Sample studies consist of form 3 students of two equal classes in same scoring. Samples are randomly selected involving group-wide using existing students in classes to be studied. Through this review, 26 Students from the experimental group (PBL approach) and 28 students from the control group (conventional method) has been selected. In this study, comparison to some variables have been done between experimental groups and control group. More clearly, the studies are described as Table 1.

Table 1. Experimental Design (Chua, 2006)

Group	*Before*	*On Going*	*After*
Experimental	U Pre	X	U Post
Control	U Pre	Y	U Post

X: Experimental (PBM learning)
U: Measurement (Scoring in exam and Questionnaire form)
Y: Controlling (Conventional teaching method)

3) Instrument

In this study, pre-test and post-test are used. Pre-conducted on the experimental group and control group. Implementation of pre-test is intended to evaluate students' ability from both groups in writing of general essay before a traditional method was approach and PBL was implemented in teaching and learning for essay form. The public used in pre-test is according to the Form 3 Measurement (PT3) format as specified by the Malaysian Examinations Board (MOE, 2014).

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Post Test held in week ninth, which was on the last study week. Questions of post-use test is in form PT3-format general compositions (MOE, 2014). This test was implemented in evaluating the effectiveness after both approaches are traditional methods and used in teaching and learning. Data comparison for pre-test and post-analysed testing by using t-test.

Questionnaire in this study divided into two parts. Part A is related background information of respondent and section B is an information about the research question. Section A contains four questions about information respondents' background by factors on demographics of gender, age and race. Section A also contains the language background of Year End Exam grade results Malay Language 2015, divided into grades A, B and C.

In Section B, the questions are focused on regarding the covered by student received of 3 levels in teaching and learning Malay Language through PBL. Pre-test will observe early achievement and students' existing knowledge is also used. Post-test is used for viewing differences in student achievement after treatment of PBL was given to the experimental group and conventional approach given to control group.

4) Data Analysis

The study was conducted for nine sessions teaching and learning in the classroom. Experimental set and control groups are provided first pre-test. During the pre-test phase, the experimental groups and control groups were provided a set of general essay exams. Experimental groups will undergo the teaching and learning process with using the PBL method, while the control group will undergo the teaching and learning process conventional methods. After the process question and answer for nine weeks, all respondent's studies from both groups are provided post-test. The form of the post-test question is similar to pre-test but question requirement is different. At the post level, lessons in experimental groups and groups the control will be given a set of survey forms about the future students.

V. RESULTS AND ANALYSIS

Ho1: There is no significant difference in the achievement of pre-group testing experiments and control groups.

The t-test is used to get answers for research questions and to test the hypothesis has been submitted. Table 2 shows no there is a significant difference between the two mean group when the t-test is assessed.

Table 2. T-Test Differences in Achievement Pre-Test between Experimental Groups and Control Group

Test	*Group*	*Mean*	*Standard Deviation*	*t-Value*	*Sig.*
Pre	Experimental	3.885	0.326	-0.094	0.925*
	Control	3.899	0.315		

*Significant at 5% level (P < 0.05)

For the experimental group that PBL had a mean of 3.885 and a standard deviation 0.326. Mean for the control group were 3.899 and a standard deviation of 0.315. Test results show the T-value is 0.094 and the significance (p) of p = 0. 925.These differences mean significant of p-value > 0.05. It shows that there is no significant difference in pre-test between an experimental group and the control group.

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Therefore, the null hypothesis (Ho1) is received. The results of these tests show that the level of achievement of the experimental group and the group control in the pre-test is statistically equivalent. This proves the group of students experimental and control group students were in the same achievement level before treatment was given to them.

Ho2: There is no significant difference in the achievement of post-group testing experiments and control groups.

T-test analysis was conducted to assess the differences between the achievements of student essay using PBL approach to achieving student essay using traditional learning in the post-test. The results of the analysis can be seen in Table 3.

Table 3. T-Test Variances in the Post-Test between the Experimental Group and the Control Group

Test	*Group*	*Mean*	*Standard Deviation*	*t-Value*	*Significant*
Post	Experimental	4.654	0.485	7.137	0.000*
	Control	4.000	0.000		

*Significant at 5% level (P < 0.05)

The findings showed that the mean of students using PBL approach was higher than the mean of students using the methods of teaching and learning common. Mean of tests after the experimental group is 4.654 and the standard deviation is 0.485. Control group showed a lower mean value of 4.000 and a standard deviation of 0.000. Difference the mean value between the two groups is 0.654. Mean of student achievement over the experimental group is higher than students control group in using learning method. Significant value (p) obtained in This study is p = 0.000. These findings indicate a significant level is less than 0.05 (p < 0.05) in which there is a significant post-test between the experimental group and the control group. Value-t is t = 7.137.

Therefore, the null hypothesis (Ho2) which is not a significant difference in achievement between groups post-test experiment using PBL with a control group using the teaching common is denied. These findings demonstrate that treatment of PBL for the experimental group was more effective than conventional approaches to control students in improving writing achievement in Malay Language.

Ho3: There is no significant difference in the performance of pre-test and post-test Experimental group.

Table 4 shows the mean of pre-test for experimental group is 3.88, while the mean for post-test increase to 4.65. For Standard deviation of pre-test and post-test were 0.326 and 0.485 respectively. Clearly indicate that there is an increment of mean on achievement in the essay after giving a testing to the experimental group by using PBM approach. Analysis result also show that significant value (p) obtained is P = 0.000. It means Significant levels smaller than 0.05 (p< 0.05). Analysis indicates that there is a significant difference in the achievement for essay exam by using PBM between pre and post test t-6.019.

Table 4. T-Test Difference in Achievement in Pre-Test and Post-Test Testing for Experimental Group

Group	*Test*	*Mean*	*Standard Deviation*	*t-Value*	*Sig.*
Experimental	Pre	3.88	0.326	-6.019	0.000*
	Post	4.64	0.485		

*Significant at 5% level (P < 0.05)

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Therefore, the null hypothesis (HO3), which stated that not there are no significant difference in performance of pre-test and post-test on experimental group is rejected. This case shows that PBM treatment conducted for experimental group of students gave an impact in increasing the performance of the essay for their Malay Language compared before PBM treatment is implemented.

Ho4: There is no significant different in the performance of pre-test and post-test for the control group.

Table 5 shows the mean of pre-test for control group only 3.89 and increased slightly to 4.11. For the standard deviation of pre-test is 0.315 and for a post-test examination is 0.000. This test shows that by using conventional method does not give a difference for students' achievement for control group. T-value shown value significant (p) acquired is p = 0.083. This means a significant level greater than 0.05 (p > 0.05) and explains that there is no significant difference between the test and the achievements of pre- post-test for the control group.

Table 5. T-Test on Performance in Pre-Test and Post-Test for Control Group

Group	*Test*	*Mean*	*Standard Deviation*	*t-Value*	*Sig.*
Control	Pre	3.89	0.315	-1.800	0.083*
	Post	4.00	0.000		

*Significant at 5% level (P < 0.05)

Therefore, the null hypothesis (HO4) states that there is no significant different in performance of pre-test and post-test control groups are accepted. A null hypothesis explains that the approach by conventional method faced a failure to increase the performance Malay Language compositions for control group.

Ho5: There is no significant difference in critical thinking skills between experimental groups students taught by using PBL method with students control group taught with using conventional methods.

Table 6 shows the mean value for student skills in critical thinking for experimental group is of 4.572, while the mean value of critical thinking for students in control group is 1.585. It shows that there are mean difference in critical thinking skills is significant among the students for experimental group and the control group. T-test show t= 26.728 and significant level (p) acquired is p = 0.000. This significant level is smaller than the 0.05 (p< 0.05).

Table 6. Test-t Difference on Critical Thinking of Students for Experimental Group (Methods PBL) and Control Group (Rule Conventional)

Group	*N*	*Mean*	*Standard Deviation*	*t-Value*	*Sig.*
Experimental	26	4.572	0.382	26.728	0.000*
Control	28	1.585	0.434		

*Significant at 5% level (P < 0.05)

Therefore, the result of T-test for analysis the null hypothesis (HO5) is rejected. This indicates there are significant difference in critical thinking skills between the students in experimental group students are taught by using PBL method with students of control group taught with using conventional methods. Findings explained that the PBL approach was successful improved critical thinking skills among the students in experimental group.

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Ho6: There is no significant difference in problem solving skills between the students in experimental group are taught by using PBL method with students control group taught with using conventional methods.

Table 7 shows the mean value for problem solving skills among the students for experimental is 4.609 while control group is 1.276. This indicates that there is a mean difference in significant problem solving skills among the students in the experimental group with Control group. T-test shows t= 33.273 and the significant level (p) obtained is p = 0.000. Significant levels acquired is smaller than 0.05 (p< 0.05).

Table 7. Test-t for Problem Solving Skills among the Students in Experimental (PBL) and Control Group (Conventional Method)

Group	*N*	*Mean*	*Standard Deviation*	*t-Value*	*Sig.*
Experimental	26	4.609	0.360	33.273	0.000*
Control	28	1.276	0.375		

*Significant at 5% level (P < 0.05)

Therefore, t-test analysis for testing the null hypothesis (HO6) is rejected. There is a significant difference in problem solving skills between the experimental group's students taught by using PBL method with students of control groups taught by using the conventional method. This proves that the PBL approach gave an effective in enhancing problem solving skills in this experiments.

Ho7: There is no significant difference in making decision skills between the experimental group students are taught with using PBL method with students group controls taught with Using conventional methods

Table 8 shows the mean value for making decision skills of experimental group student is 4.517, while the mean value for control group is 1.265. It indicates that there is a mean difference in problem solving skills in between experimental group and the control group. t-Test showed t= 35.782 and significant level (p) obtained is p = 0.000. Significant level that acquired is smaller than 0.05 (p< 0.05).

Table 8. T-Test Difference in Critical Thinking Skills of Student for Experimental Group (Methods PBL) and Control Group (Conventional Method)

Group	*N*	*Mean*	*Standard Deviation*	*t-Value*	*Sig.*
Experimental	26	4.517	0.299	35.782	0.000*
Control	28	1.265	0.362		

*Significant at 5% level (P < 0.05)

Therefore, the t-test analysis for testing the null hypothesis (HO7) is rejected. There is a significant difference in making decision skills among the students of experimental group taught using the PBL method with students control group taught with using conventional methods. Rejection this hypothesis explains that PBL is capable of improve making decision skills of students of experimental group.

Ho8: Identify whether there is significant difference among the students in contradictory skills for experimental group taught by using PBL method with control groups taught with using conventional methods.

Table 9 shows the mean values for contradictory skills among the student for experimental group is 4.610 while the mean value control group is 1.276. It indicates that there is a difference in mean on contradictory skills in which

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significant experimental groups and the control group. T-test indicates t = 33.273 and significant level (p) acquired is p = 0.000. This significant level is smaller than 0.05 (p< 0.05).

Table 9. Test-t on Contradictory Skills Difference among the Student in Experimental Group (Methods PBL) and Control Group (Conventional Method)

Group	*N*	*Mean*	*Standard Deviation*	*t-Value*	*Sig.*
Experimental	26	4.517	0.299	35.782	0.000*
Control	28	1.265	0.362		

*Significant at 5% level (P < 0.05)

Therefore, the t-test analysis for testing the null hypothesis (HO8) is rejected. There is significant difference on critical thinking skills between the experimental group of students are taught with using PBL method with students control group taught with using conventional methods. This case proved that PBL approach effectively in enhancing students' contradictory skills on experimental group.

VI. DISCUSSION

1) Differences between Experimental Groups Taught Using PBL and Control Group Taught Using Conventional Method in Pre and Post-Tests

Basically, this research is conducted to investigate on the effectiveness of PBL on student performance and HOTS in Malay Language essay. Statistical analysis of t-Test was carried out to Answer the first null hypothesis and the results found that the null hypothesis were accepted. This indicates that no significant difference on achievement of pre-test among students on experimental group and control group. The findings showed that on preliminary stage of study, students in experimental group and control group have the same abilities in writing Malay Language essay.

Next, the t-test is used to test second null hypothesis and result of value sig = 0.925 namely p > 0.05 found that the null hypothesis is less. The findings of this study are supported by research Esti (2010) stating that the model PBL that involves active learning in students can solve problems by teacher. This will subsequently effective learning and capable of thriving student performance. Similarly, Nurul Aisyah et al. (2016) based on teacher's review on student study results, 50% of participating students are able to write more compact and convincing for related compositions with topics discussed in the process PBL. Students can write descriptions and provides relevant examples for explaining the topic given by the compositions. Therefore, higher scores can be earned in sentence section.

For the third null hypothesis, the significant value = 0.000 is p < 0.05 indicates that there is a significant difference in the performance of pre-test and post-test for experimental group. After experimental group on PBL in teaching and learning, their achievements increased compared to test before undergoing PBL. The results of this study reinforced by the Suzilawati (2007) against form 4 students who have been involved in PBL is higher and statistically significant. As compared to form 4 students, their achievement only involved in conventional method. The findings of this study were aligned with the findings of research conducted by Akinoglu and Tandogan (2007) that found implementation of active learning using PBL method has a positive impact on Academic achievement.

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Erdal et al. (2007) reviewed PBL in science learning found that the test score post-mean on students in the experimental group (PBL) by statistically is significant $p < 0.05$ compared to students in control group (conventional) favour to this PBL. This improvement was observed on impact of the PBL approach that encourage students to work in collaboration to determine learning information, where appropriate, questioned and researching to build deeper understanding, evaluating possible solutions to this problem and choosing the best solution.

Sabaria (2003) found that students following PBL has higher achievement compare than the group of students who follow conventional teaching method. His findings were supported by the argument that discussion activities in PBL can be to strengthen understanding among the students' content. Activities for seeking information through access learning also said to help students providing focus and assertion to concept concepts learned. In the process to resolve problems, students are involved in where knowledge is applied for new situation. More frequent students doing a solution, then the more frequent students perform a thinking process about subjects learnt, and the frequency of thinking will further contribution for understanding at a higher level in learning the subjects.

Refers to the forth null hypothesis, the outcome of t-test has accepted the hypothesis with sig value = 0.083. There is no significant difference in the performance of pre-test and post-test for control group. Student achievement for control group learning is the same level in pre-test and post-test. Malar (2013) states that learning more emphasis on learning individual and lack of cooperation in knowledge sharing to resolve the assignment. Conventional learning methods are highly in contrast to PBL which is a method learning by group up to achieve the goal of creating a quality task and indirect enhancement. Students are more understanding on their achievements.

In addition, the learning methodology in the same year also affects students ' achievement in a subject matter. According to Zamri and Jamilah (2018), teaching this conventional based on method is too often or commonly used lessons by teachers in school and did not have a new thing that can stimulate students to continue learning a subject for achieve excellent results. Students quickly feel bored and lack of focus if the teaching methods of teachers are not diversified.

2) Differences of the Group's Student Achievement for Experimental and Control Groups Taught to Use Thinking Skills at High Level

In t-test is used to test the fifth null hypothesis that showed a significant value 0.000, which is the $p. < 0.05$ that rejected null hypothesis. After undergoing a PBL approached, there is a difference in significant towards critical thinking skills in between student from experimental group and control group. Findings of study was supported by the results of the Sungur et al. (2006) that found if a teacher is only reminding their students to remember and memorising the facts for subjects to be taught and re-playing it during examination, then a conventional lesson was sufficient to achieve.

Otherwise, if the teacher wishes to apply the cognitive skills in higher level such as making synthesis and judgment, then the teacher may optimize the benefits of PBL used. According to Jamal and Oleg (2015), the PBL approach stimulated radioactivity and personal skills of students. Collaborative learning available in PBL has

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prompted students to develop the HOTS that required cooperation for the problem solution. PBL approach was realised with taking into account the development of the HOTS will produce students who are able to think for critical problem.

Based on the sixth null hypothesis, t-test showed sig = 0.000 means the 6th null hypothesis was rejected. Students problem solving skills in experimental group is higher compared to the students of the control group. Fauziah et al. (2010) was strengthen the findings of this study find that PBL approach makes students more striving to learn to be more independent and motivated in solving problems in more details. Ranjana (2013) states that PBL is an effective method for improve problem solving skills student. Students will build strong relationships between concepts when they know the facts by actively working to earn information is not just about receiving information passively. PBL encourages students to work in solving a problem and coming along increase student confidence in problem solving. This skill can put PBL students on the inside edge of their career.

The Ho7 is also deducted by the sig = 0.000 in T-test. Findings of study found there is a significant difference in making decision skills of students for experimental groups taught with using PBL method with students control group taught with using conventional methods. This finding equivalent to the statement of Alias (2015) which state that one of the methods of solving the solutions and decision-making are using the PBL approached. De Janasz et al. (2002), PBL method give a lot of ideas to solve and then select the best results because this method is one of techniques in which many people from one group sharing ideas on a subject without criticize. This should be an open discussion in the group are encouraged to create creative ideas.

This method applies to problems group. Students should decide to making decision accurately and make sure that the decision made is the decision the best one. In addition, students need to have strong grounds to support the decision that already taken. Selection of these results is generated using various methods for ensuring quality decisions are gained. In the study module PBL by Ranjana (2013) found the skills to make clinical outcomes of nursing students increased. It makes it easier and to launch their nursing assignments as their ability to make a quick peel and accurate.

Finally, t-test on time was conducted to test the 8th null hypothesis and showed the values sig = 0.000 that has rejected the null hypothesis. There are significant difference contradictory skills of experimental group students (PBL) with students of control group (conventional). The findings of this study are supported by Kristinn (2002) which states that the first goal of PBL is development to use knowledge and expertise in a rich knowledge base. The study of Devi (2012) also supporting this study shows the ability students in predicting further effects of suitability or the item is 95% and is categorized in the very good criteria. Contradictory evaluation on experimental groups found in the review this automatically increases from good being excellent. On the criteria for finding the cause problems of students need to analyse that cause of the problem can occur and the source of the problem occurred. Students finding a source of problems from all fields good in economic, environmental conditions and level community knowledge. Average students have can find the cause of the problem.

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VII. CONCLUSION

PBM approached involving the process of analyzing problems in which necessary for thoughts development and considering all the possibilities. Objective in this study is to find the cause of a problem happens. A problem cannot be resolved until the cause of the problem happen. Some questions should be asked on what, where, when, who and how the problem occurs. Each problem is analysed from various angles as the importance of problems, self-experience, other party reactions, cost of problems, locations occur, comparisons with other problems and other (Mohd Azhar et al., 2004). Cases support students to understand their causes of implied problems. Cases can help students learn identify the root of a problem or problem source as advent key effects on other problems. The process of identifying the cause the problems found in PBL can helps students improve capability for useful contradictory in daily life.

Cognitive ability of students maximised in PBL by giving the opportunity to students to give the ideas for understanding of problems. Cognitive operations can grow creativity to think in present a problem. Of the problem that students set, they can develop skills to solve the problem and can present a solution with logical ideas (Alias, 2015). PBL is approached by teachers in each subject since PBL provides diversity in the process of teaching and learning. In addition, for changing learning method is usually focused on teachers' centred, activities carried out by cooperative learning concept is also providing an active learning environment. The effect of this active learning will give a positive impact on achievements students in a subject matter.

PBM process is travelled by training students to think critically in solving a problem. Before decision made to determine the solution, the student reviews the problem in the manner of discussion with their friends. Results of the discussion can increase contradictory skills by giving them confidence to make the best decisions in problem solving. Through PBL students can increase the performance even indirect HOTS covers critical thinking skills, problem solving skills and contradictory skills (Zamri, 2018).

In conclusion, this study shows that the teaching and learning assisted by PBL approached have a positive impact on students' achievements. Therefore, hopefully the educators will use PBL in teaching and learning every subject. Guests appropriate students are given exposure and the diversity of teaching and learning techniques in addition to complete dependent on the next teacher the teaching and learning process will also be more attractive. Teachers must always be creative in diversify teaching techniques and always keep abreast of current developments in the preparation of teaching is always seen positive and conducive nature. This study also demonstrate that the PBL approach is extremely encourage students ' involvement, as well as Teachers as facilitator. Both teachers and students are exposed to an experience, which is learning to study a problem without relying on the teacher alone. Student creativity can also be developed in discussions between members of the group.

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