

## Learning history through project-based learning

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### ABSTRACT

In a 21st century classroom, project-based learning (PBL) can be the key strategy in helping students become independent learners and thinkers. PBL provides a pedagogical approach that is appealing and can be used not only in the subject of history but also across different disciplines. This study examines the impact of project-based learning on students' understandings of Upper Secondary Brunei history lessons. Data was collected from a Year 10 Upper Secondary history classroom in one secondary school in Brunei through an action research method. The instruments used were lesson observations, semi-structured interviews and pre- and post-tests. The interview was conducted with eight students while classroom teaching of the subject teacher was observed. The pre- and post-tests were given to students before and after the intervention of PBL. The findings in this study showed that the students were still underperforming after the PBL intervention but had shown potential for further improvements with more exposure to project-based learning.

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## 1. INTRODUCTION

Globalisation has not only opened up many new opportunities for individuals but has also brought about challenges for the people of the society today. As the world was becoming more globalised, there calls a need for individuals to attain different sets of skills and knowledge that will open doors for them to land a secure job in an increasingly competitive labour market [1]. There is a need to develop a 'world-class education system' that would not only be used to increase the quality of students' education but to also equip students with skills that would prepare them for the rapidly changing global environment [2]. In Brunei, the Ministry of Education (MOE) started a move towards changing the education system in 2009. The aim was to prepare Bruneian students for a globalised society and this was translated through the implementation of the national educational system, known in Malay as "Sistem Pendidikan Negara Abad ke-21" or the National Education System for the 21st Century, in short, SPN21. The strategy called the need for students to be equipped with 21st century skills such as 'technological literacy skills, critical thinking skills and problem-solving skills' that are deemed valuable in the techno-centric world today [3]. Being equipped with these skills will ensure the success in the assimilation of the younger Brunei generations into the rapidly-changing and competitive labour workforce of the near future [2]-[4].

To ensure that the younger generation would develop 21st century skills in schools, the Ministry of Brunei had taken initiatives to make changes to the curriculum that would put an emphasis on student-centred learning as was evident in the introduction of the school-based assessment (SBA), where a percentage of the students' overall grades would be attained from project work [5], [6]. The Ministry of Education had

emphasised that SBA would act as a platform in ensuring that there was an increase ‘in the application, analysis and evaluation of student involvement in practical work, projects, presentations and learning activities’ that would not only provide students with knowledge and understanding of the subject but would also provide them with necessary skills that would gear them towards higher order thinking and to obtain ‘quality-oriented education’ [3], [5]–[7]. A shift in the teaching paradigm thus brings about the transformation of the teacher’s role from the provider of knowledge to that of a facilitator who would provide guidance to the students in their learning [3], [7], [8].

In Brunei, there had been a gradual drop in the number of students taking history at upper secondary level in Brunei [4] and history was one of the most underperformed subjects in the Cambridge O-level examination that the students sit for at the end of their secondary school years [9], [10]. On the issue of the drop in the number of students taking history as a subject, it was possible to argue that one of the reasons for this could be the change in the curriculum that combined both history and geography into one subject known as social studies for the upper primary and lower secondary levels. As compared to the years prior to the change in the curriculum to SPN21, it was noted that students were more exposed to historical contents at an earlier age as was reflected in the textbooks that were used during their upper primary school years [9], [10]. Even though students learned about the history of Brunei in Social Studies subject, more emphasis were now put on geographical and cultural contents in the new curriculum [11]. Over time, due to the lack of exposure to the history of Brunei from a young age, this will cause students to not think highly of the importance of learning history and thus, students will either choose to not learn history at upper secondary level or to underperform in the subject when given the opportunity to learn history [11].

It was possible to argue that the issue on the underperformances of the students in history may be due to the lack of enthusiasm of these students when it comes to learning the subject. As an optional subject in Brunei secondary schools, history was often only been offered as a choice subject to students [9], [11]. This impedes the chances for students who are genuinely interested in taking up the subject and forces the subject upon students who are not in the least interested in learning about history [9]. Previous studies found that students who were forced to take history often underperformed in the classroom [9], [11]. Students not only dreaded to attend the classes but also found the subject to be “boring” and thus, they often did not put in any effort to learn about the subject [10]. Although the SPN21 curriculum calls for lessons to be more student-centred, it was found that the traditional ‘chalk and talk’ method was still predominantly used in lessons [12]. This was because the Brunei education curriculum was still heavily dependent on public examinations and so, teachers were compelled into sticking to the scheme of work that was in accordance to the syllabus content [12]. As students were already reluctant in learning history, the use of the traditional ‘chalk and talk’ method had worsened the learning experiences for these students [9], [11]. Another issue that the researchers had found when interviewing the students was that English language might play a significant role in the underperformances of these students [11]. Students often had difficulties in digesting what they learned in history due to the lack of ability in understanding the vocabularies and language used [10]. They had difficulties in projecting their ideas and making connections to the different historical events during class discussions and in exams [10].

However, it was important to understand that one of the aims of the MOE’s strategic plan initiative on ‘quality education’ highlights the need to equip future generations with 21st century knowledge, skills and values supported with an intended, adaptable and relevant curriculum focusing on the needs of individuals [4]. Therefore, it is believed that implementing project-based learning (PBL) in this study meets the ministry’s aim of providing ‘quality education’ for the students. Recent studies have highlighted that PBL is a pedagogy that enables both teachers and students to move away from the traditional methods of teaching specifically the ‘chalk and talk’ method [13]. PBL offers the opportunity for students to develop into active learners who would be required to search for knowledge to resolve problems that might appear in their projects, and not be passive learners who absorb second hand knowledge from their teachers [13]–[15]. Implementing PBL in the Bruneian context would reflect the SPN21 curriculum as it calls for students to develop 21st century skills such as collaboration, critical thinking, and problem solving. By adopting the PBL approach, teachers could focus on the students’ needs in the classroom as PBL concentrates on the use of various learning activities and tasks in order to engage the students in the lessons [16], [17].

This paper highlights the need to move from the traditional approach to a more comprehensive 21st century approach where lessons are designed to engage the students in not only carrying out in-depth investigations on a topic that interests them but to also give the students the opportunity to build on their problem-solving and critical thinking skills. Following the theory of constructivism that was in line with what 21st century learning calls for, PBL was a key strategy to help students become independent thinkers and learners as they would be able to construct knowledge through the means of active learning and collaboration with their peers [18], [19]. On the other hand, it was found that there are teachers and students who preferred the traditional teaching approach over PBL [17], [19], [20]. Students had preferred the traditional approach as

they claimed to have learned more using the traditional approach as opposed to the use of PBL [19], [20]. Most of the concerns brought forward by these researchers were that teachers were reluctant to move from the use of the traditional approaches as they were more comfortable with the idea of having control over the classroom [19], [20]. Research has highlighted that students were in fact the ones who had preferred the use of the traditional approach as they were uncomfortable with the idea of having to obtain knowledge on their own [21]. Even high achiever students were reluctant with the use of PBL as they felt that collaborative learning was a burden for them when they have free riders in their groups [22].

However, in general, researchers have emphasised on the importance of PBL as a centrality to learning for students during lessons and that PBL was not peripheral to the curriculum [13], [16], [21]. This was to say that in order for students to be able to grasp onto the main concept, teachers are required to provide students with problems or questions to ‘drive’ their minds [16]. Driving questions are used by teachers to ensure that students are able to make a connection between the activities that they will be carrying out and the underlying knowledge that the teacher hopes to foster. With the driving question, students will then be able to investigate thoroughly into what was expected of them to answer the driving question. Through the constructive investigation, students will build up on their prior knowledge and it was often during these investigations that students will encounter problems. Hence, unlike the traditional approach, PBL offers students with the opportunities to develop 21st century skills that are required in the working society today [21], [22]. For instance, in order for students to overcome the problems that they will encounter during the investigation phase, the collaborative aspect of PBL allows students to not only work together to come up with a solution but they could also make use of the technological tools to work on the problems together. These skills are vital for the survival of students in the globalised techno-centric society [1], [3], [7]. In relation to the purpose of this study, the following research question had been formulated to help with the research: To what extent did the use of PBL help improve students’ content knowledge of Brunei history? What were the students’ perceptions on the use of PBL in history lessons?

## 2. RESEARCH METHOD

This action research focused on examine the impacts of PBL on the students’ understandings and the perceptions of students on the use of PBL in the classroom. This was done through the use of classroom observations during the subject teacher’s lessons as well as when the students were carrying out the PBL approach; pre- and post-tests that were given to the students before and after the intervention; and the use of semi-structured interviews throughout the study. The participants involved in this study were eight of the Year 10 Upper secondary students of the subject Brunei history. Their ages ranged between 14 to 15 years old and had varying English proficiency abilities. Prior to the start of the study, the students were informally interviewed by their teacher (the first author in this study) and it was found that the students were not familiar with PBL but they were enthusiastic about doing hands-on group activities. It was discovered that most of these students disliked the subject History as they found the subject to be “boring” and “difficult to understand.” Therefore, the introduction of the use of PBL seemed appropriate in finding out whether the alternative method of teaching would change the students’ perceptions regarding history that could help with their understandings and thus, have an impact on their performances in the class. Data was analysed qualitatively where data collected was manually coded and interpreted into themes. However, this study had its limitations. The findings yielded were not representative of Year 10 history secondary students in Brunei and the findings could not be generalisable as it only represented the situations in the school that was involved in this study.

## 3. RESULTS AND DISCUSSION

### 3.1. To what extent did the use of PBL help improve students’ understanding of Brunei history?

The data obtained from the pre- and post-tests, observations, and informal question and answer sessions, with the students were fundamental in answering this research question. Prior to the PBL intervention, the researchers had interviewed the students’ subject teacher and had found that one of the main reasons for these students’ underperformances in their tests and examinations was because of their inability to understand what the test questions were asking for. Due to this, students often just wrote down any information that they could remember about the topic and thus, will end up not quite answering what the questions had asked. It was therefore the researcher’s aim to see if the use of PBL would change the students’ overall understandings of history lessons as well as their understandings of any questions being posed to them. The analysed findings could be categorised into the theme ‘development of understanding in terms of content knowledge and answering questions.’

### 3.1.1. Development of understanding in terms of content knowledge and answering questions

Prior to the students sitting for the pre-test, it was important to note that these students already had background knowledge on the 'economic and social developments of Brunei: First and second national development plans' as their teacher had just completed teaching the topic to them. The results from the pre-test had shown that most of these students had disregarded what the question was asking for and were merely listing out what they could remember about the first and second national development plans (hereafter as NDPs) from their lessons with their teacher. Some examples of the answers that were written by the students during the pre-test:

*"In 1953 the first NDP was launched for a period of five years. ER Bevington, the commissioner from colonial in Fiji was appointed to carry out the plan. A budget for \$100 million for the scheme was given by state council. The aims were to bring Brunei out from its lowly status in Southeast Asia and to improve the living standard of people."* (Student D)

*"National Development Plan was established by SOAS III for 5 years from 1953 to 1958. E.R Bevington was appointed to carry out this plan. He was the High Commissioner Colonial office from Fiji. A budget of \$100 million was given by the state council. The aim of the NDP was to improve the standard of living of the people. Also, it was to modernise the mosque and to improve the lowly status of Brunei in Southeast Asia. The NDPs help for the development of education. From this development in education, many people in Brunei learned lots of new knowledge. The NDPs helped the development of health. The development of Social Welfare was made to help the elders for a better living such as providing wheelchairs. Also, the aim of NDPs was to improve the non-oil and gas industries."* (Student G)

It could be seen that the answers given by student D and student G were replicas of the information that was readily available in the history textbook as well as their notes. Apart from that, these students had also successfully given the name of the high commissioner who was sent to Brunei to carry out the NDP as well as listing out the budget that was allocated for the NDP. All of the above-mentioned students had also correctly listed out the aims of the NDP in their answers. However, even though the students had shown that they were able to briefly and accurately include some correct historical information regarding the NDPs in their answers, these students had failed to answer the question that had been posed to them which was "In your opinion, how important do you think the NDPs were in contributing to the making of modern Brunei?; Try and link what you know about the NDPs to what you can see around you today." During the pre-test, a majority of these students disregarded the part of the question where they were assumed to be able to use their background knowledge on what they knew about the economic and social developments under the first and second NDPs to relate to the changes that they could see in modern Brunei. The answers given by the students only reflected partly what the question was asking for and thus, it was possible to say that this might be owed to the lack of students' understanding when it came to reading the question. Partly the reason for this could be that these students were used to being mainly taught and given the information regarding the NDPs thus they lack the experiences in putting their answers to practice on paper. It was also possible to argue that these students were not taught ways in developing their critical thinking skills through the use of the traditional approach. The traditional approach of teaching and learning only required students to 'remember' and to 'understand' the information that were relayed to them before they were asked to reproduce these answers in the examinations. This was relevant to the way that these students were taught in the classroom and therefore, it was possible to argue that they were not given the opportunities to develop their higher order thinking skills, such as to 'analyse' and to 'evaluate' any information or questions and thus, these students would only end up listing down everything they knew as was reflected in the answers that were given by them in the pre-test.

The researchers had hoped that with PBL, these students would be able to move forward from the 'lower order thinking skills' of the Bloom's Taxonomy and develop 'higher order thinking skills' and thus, would be able to not only list out what they knew about the NDPs in their answers but to analyse the question and to include answers based on their understandings of the question. Due to the inexperience of the students with the PBL approach, the researchers had to guide the students through the use of worksheets. In these worksheets, the students were guided through the different steps that had been broken up into several activities. It was hoped that by breaking up the NDPs into different parts, it would enable the students to see that the NDPs were not just about the historical background but to also show to the students that the NDPs were made up of both economic and social developments. Once the PBL intervention had been successfully carried out, the students were once again given the same question to do.

From the post-test, it was found that even though the students were still listing out information and not quite answering the question, the students' understandings on the topic had actually improved. Instead of just writing down what they remembered or memorised from the textbook, majority of these students had made an effort to try and show that the developments under the first and the second NDPs had in fact been important in the development of modern Brunei. For instance, a majority of these students could see that the education system today was largely owed to the development of education under the first and second NDPs and these students could also see the importance of education to Bruneians. Below highlights some of the examples given by students on the development of education.

*“More emphasis was placed on education. Education was made compulsory which led to the building of new schools. Brunei people became educated and obtained more skills. These skills helped Bruneians. They could get jobs in other countries. Scholarships were given to students to continue further studies which started in 1957. Many students were sent to overseas and later came back to work for Brunei government.”* (Student C)

*“... provides Bruneian people like scholarships for students who get excellent results in their A-levels.... To provide buses for students to go to school, provide hostels for students who live far away from schools or colleges...”* (Student D)

*“The government built more schools for Bruneians to be educated...they can work in another country. With education, they can get skills like how to build houses, develop technology, etc... The government also provides scholarship or sent students to go overseas to study.”* (Student E)

As shown above, it was found that there was a slight improvement in some of the students' understandings in terms of how they were able to briefly use historical social developments as a platform in linking to the social developments in modern Brunei. For instance, instead of going straight into the introduction of higher institutions, such as colleges, or the setting up of new secondary and primary schools in Brunei, these students were able to bring up the history behind the importance of education in Brunei. This could be seen in how these students managed to link the 'compulsory education', introduced by the Bruneian Government under the first and second NDPs to the development of new schools in Brunei. Furthermore, students had made the links to the 'scholarships' given to students that had started under the first and second NDPs which had then encouraged more students in this generation to do better so they would be able to come back to Brunei to help in the developments of Brunei. It was therefore possible to say that PBL had in fact been successful in helping some of these students developed understanding skills in history lessons. A possible reason for the slight improvements in the students' understanding could be that these students had started to develop a more positive attitude towards learning as could be seen in their involvements in the activities that were carried out during the PBL intervention. Through observations, the researchers had seen a drastic change in the behaviours of the students especially in regards to their engagement levels in the classrooms. During the PBL intervention, these students had not only become more attentive towards their work but they were also showing positive signs that they were emotionally engaged during these sessions. This finding therefore supports the findings from other researchers, whom had found that PBL have had impacts on the engagement levels of students [13], [14], [18]. When students were engaged, they would be motivated to want to do better in their tasks and to work out of their comfort zones [20]–[22].

However, upon further analysis of the post-test answers, the researchers encountered that a majority of these students had only mainly touched on the importance of social developments of Brunei under the first and second NDPs. Lack of understanding on the economic developments of Brunei was reflected in the post-test answers given by the students. In both the pre- and post-tests, the students had failed to look into the economic developments of Brunei, let alone explain how the economic developments under the NDPs had helped in the making of modern Brunei. However, some students had briefly mentioned the development of 'oil and gas industry' as well as 'other industries' in Brunei. Instead of explaining why these 'other industries' were set up in Brunei, the students went on to explain more about the historical social developments of Brunei. The students' answers indicated that they lack of understanding in the history of economics development of Brunei. Yet, it was plausible to argue that the students' lack of knowledge on the economic developments of Brunei was largely due to the flaw in the students' worksheets, which were designed and given by the teacher. The worksheets mainly concentrated on the social developments of Brunei in the first few activities instead of asking students to carry out research on the economic developments of Brunei.

To support the findings from the pre- and post-tests, the teacher had conducted an informal question and answer session with the students towards the end of the PBL intervention. When being verbally asked regarding the developments of Brunei under the first and second NDPs, these students were able to verbally

provide the teacher with the correct answers to the questions that were asked. Hence, it was possible to say that the students' post-test answers were not clear indications of their understandings. The researchers found that a possible explanation for this could be their lack of confidence when it came to putting down their ideas on paper. Before the study was conducted, the researchers had interviewed the class history teacher and found that the inability of the students in writing down answers during examinations was affecting their performances in the subject. Another reason for this could be the nervousness of these students when it came to examinations. To overcome this nervousness, previous studies had found that PBL could be used to reduce students' anxiety levels in the classrooms and during exams [23], [24]. However, from this study, it was discovered that when the post-tests were given to the students, they still showed signs of anxiety and nervousness which thus, reflected in their post-test answers.

### **3.2. What were the students' perceptions on the use of PBL in history lessons?**

In answering the second research question, the data obtained from the semi-structured interview were used. During the interview, students were asked regarding their learning experiences with the PBL approach and the responses from these students revealed mixed perceptions with some students liking the idea of the PBL approach whereas a majority of the students were leaning towards the use of the traditional approach. The findings from the interviews were categorised into two themes: conducive learning environment, and effects of motivation and collaboration on students' learning.

#### **3.2.1. Conducive learning environment**

A student's learning environment affects the student's ability in the classroom. It was therefore essential for the teacher to ensure that the classroom environment was able to foster to the needs of each individual so that students will feel comfortable as members of the class and thus, will be able to adapt to any new approaches set out by the teacher [19]. As the students who were involved in this study were fairly new to the PBL approach, the teacher had to ensure that the students felt comfortable with the change in the learning approach so in order to encourage the students, the teacher tried to provide the students with guidance from the beginning until the end of the cycle. From the interviews, it was found that students were in fact comfortable with the change in the learning approach but what really stood out the most for the teacher was how greatly the external environmental factor had impacted on the students' behaviours in the classroom that affected their overall performances. Students commented on how the change from the normal 'boring' classroom setting to the air-conditioned information and communications technology (ICT) room had made it more 'comfortable' and 'better' to study in as compared to the 'hot' classroom that they always have their lessons in. This finding supports the study where there were correlations between the temperature in the workplace and a worker's efficiency [19]. Thus, as these sessions took place in the afternoon when the weather was the warmest, the results yielded from the study would have turned out differently if the study was conducted in their normal classrooms. Apart from being in the comfort of an air-conditioned room, some students had also mentioned that the extrinsic motivation from the teacher 'giving [them] chocolates' had also motivated the students to attend the afternoon sessions and to be actively involved in the study. Therefore, it was plausible to say that the satisfaction from being in the air-conditioned room and the chocolates from the teacher had in fact motivated students to attend the sessions and to be more engaged in the learning process.

#### **3.2.2. Effects of motivation and collaboration on students' learning**

It was observed that when the students were motivated, they became more open to the idea of trying out the PBL approach. During the interview, it was found that only one out of the eight students found the PBL experience to be 'fun' whereas the other seven students found the experience to be 'repetitive' and 'took a long time' and as a result, the process became 'boring' for them. Although the findings were not favourable, it does not show that the students were not motivated nor disengaged during the process. This was because some of the students whom had found PBL to be 'repetitive' and 'boring' mentioned that the PBL approach had given them the opportunity to be 'creative' in terms of how they presented their learning to their peers. In other words, they reported that the information they obtained through the PBL approach were 'different from those in the textbook' [21], [25]–[30]. In addition, the students mentioned that PBL gave them the chances to work collaboratively with their friends. They liked the idea of 'teamwork' because they felt that the 'cooperation with one another' enabled them to 'easily share information' and they '[could] discuss together'. These findings supported the studies where PBL enabled students to learn more when they work collaboratively as they could 'bounce ideas off each other' [21]–[30]. Significantly, developing 21st century skills such as collaborative skills that the students had attained through the use of PBL would be of use to the students during their working lives in the future [17], [18], [21]–[28].

Being motivated to learn and being engaged in the learning process will not necessarily result in students' improvements in either their understanding or performances of the subject. As the students in this study were already used to the idea of being the passive recipients of information, it took a while before the students became used to the shift in the teaching paradigm. Due to this, the findings from this study showed that a majority of these students still preferred the traditional approach over PBL because they felt that it was 'easier for them to understand when the teacher explained' as most of these students found it 'difficult to find information online' and 'could not see the point of doing PBL'. Simply put, these students were not comfortable with the drastic change in their roles. This finding is similar to other recent studies [16], [17], [21], [22]. Furthermore, in this study, some students even mentioned that they were 'lazy' when it came to doing their own learning and thus, preferred the traditional approach. There were, however, students who could see the benefits of using PBL. For instance, one student explained that through PBL, the student could 'see the picture online and could read more things that are not in the textbook'. Hence, PBL had helped the student to understand the topic further. Another student had mentioned that PBL was preferred because 'the textbook does not really give much understanding' and 'when using the traditional approach, [they] just copy straight without trying to understand the events.' The students were also asked if the use of PBL had had any impacts on their opinions regarding the subject. The findings showed that the limited time spent using the PBL approach was not effective in changing the mind-set of the students as most of these students still felt that 'history was difficult' and thus, 'still do not really like history.' It was also important to note that despite providing the instructions and guidelines at the beginning of the cycle, there were still students who, during the process of carrying out their work, found it confusing as to what should be done and what was needed to be done. This had no doubt affected the students' opinions regarding the use of PBL. To overcome this, the teacher had to regularly remind the students on the context of the exercise to ensure that the students did not lose track as to what should be done.

Overall, as this was the first time that the students had experienced PBL. The findings from this study suggested that despite the obstacles in the use of this approach, there was potential for a change in the students' mind-set regarding the approach which will eventually lead to improvements in their overall performances. Through subsequent cycles of action research, these obstacles and drawbacks could potentially be resolved.

#### 4. CONCLUSION

The findings yielded from this study highlighted several important points that should be noted. It was found that the implementation of PBL was only successful to an extent as was reflected in the slight improvements in the students' understandings as well as overall performances especially in regards to their behaviours towards learning history. However, the researchers found that students were still sceptical of the use of PBL and preferred the use of the traditional approach. This might be due to the inexperience of the teacher in making PBL seem more appealing to the students, yet this could be improved with more practices on the use of PBL in teaching history.

This study suggested that if PBL was to be implemented properly through the use of more practices, PBL can be a good pedagogy in the classroom that will not only make learning fun for the students but to also help them in their development of 21st century skills. In other words, as most Bruneian students are new to the PBL approach, the implications from the findings suggested that sufficient time should be put aside for scaffolding students' knowledge as they need to get used to the idea of PBL. This was to say that the teacher should not implement PBL in the classroom and expect students to carry out all the work themselves without a lot of guidance. Therefore, it is recommended that the worksheets that will be given to the students will need to be thoroughly checked and tested out before the implementation of PBL in the classroom. This is to ensure that mistakes such as the one made by the researchers will be addressed beforehand so that students' learning process will not be affected. Furthermore, it will be more beneficial for the teacher to employ a bit of the traditional approach especially when it comes to explaining main concepts to the students to ensure that the students will grasp onto the idea first before carrying out their own research. Careful planning should be done by the teacher before the employment of PBL in the classroom to ensure that it fits into the scheme of work of the school and curriculum. Hence, before implementing PBL in the classroom, it is recommended that the teacher will need to ensure that there will be resources that are readily available for the students to use especially when it comes to resources on the history of Brunei.

In conclusion, the findings from this study had revealed that majority of the students had difficulties in expressing their understandings of the topic in writing. Yet, the results from the post-test as well as the interviews with the students, had shown that there was indeed a slight improvement, to not only the students' overall understanding in history, but also to their understanding of what the questions had asked. It needs to be taken into consideration that since this was the first time that the students had been exposed to PBL, the results obtained from this study would not have highlighted a great change in the students' performances.

However, it was plausible to say that these students did show potential in further improving their performances and thus, with more practice and exposure to PBL, there was no doubt that these students will grow to like PBL and will continue to further improve on their understandings of the subject.

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