

PROJECT BASED APPROACH TO STIMULATE CHILDREN'S CURIOSITY: THE CONTEXT OF PRESCHOOL CLASSROOM IN BRUNEI

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Abstract

Curiosity, defined as the 'desire to learn more about something or someone' (Merriam Webster Online) has always been positively linked with the positive drive in attaining knowledge. However in school, the importance of curiosity is hardly addressed. Even children, who are always curious, risk slowly losing their sense of curiosity as they enter preschool (Parvanno, 1990) because of the formal education that they receive in school. Therefore, this study aimed to explore and examine implementing Project Based Approach as a valuable pedagogy in stimulating children's curiosity within Brunei's preschool context. This research aimed at addressing the benefits and the difficulties not only in understanding the concepts of Curiosity and Project Based Approach, but also during the implementation of the pedagogy within Brunei's preschool context. The study was conducted using a qualitative action research approach. Data was collected from the field notes taken from Observation, Brief Interviews and also from the Researchers' reflection notes. Results from the inductive content analysis revealed that Project Based Approach could provide a lot of benefits. In addition to stimulating children's curiosity, it has also helped in improving children's peer collaboration and improving children's confidence. Finally, this study has also shed some light on the difficulty of translating Project Based Approach into Brunei's preschool context and how it has managed to overcome this issue.

Keywords: Action research, project-based approach, curiosity, preschool classroom.

INTRODUCTION

Children without having much knowledge on the world are always full of curiosity. Thus preschool teachers should be able to take advantage of this and therefore prepare lessons that could arouse their curiosity to learn more on the particular subject. Most of the time what happens after children go into school is that they tend to lose their sense of curiosity. As they experience formal education, children get used to receiving knowledge from the teachers and as a result they became passive learners, going more into *rote learning*, learning without understanding their knowledge (Clark, 2000). Schools have been said to be one of the reasons why students started to lose their curiosity or their interest on the subjects they are learning because school is perceived to be a place where students can only get their academic knowledge and nothing else. According to Gardner (1999), education is about shaping individuals to the kind of persons that he desired the young of the world to become (Gardner, 1999). He believed that it is more important to promote a deep understanding in the workings of meaningful participation in today's and tomorrow's world (Gardner, 1999). He understood that this would be difficult to achieve as education is actually constrained to time and place. What this means is that what we learned in school usually happened in the past or seemed purely theoretical and therefore making it relevant for students or in Gardner's own word "meaningful" would be difficult. This is why Gardner suggested that educators should constantly *explore ways* to ensure that teaching to be relevant for their students. We tend to say that what we learn in school is not applicable when we enter the real life environment. It is the time to change this notion. With both beliefs of curiosity and meaningful should be included within teaching and learning, we set out to discover that we could try and achieve both using Project Based Approach as a pedagogy. Please note that Project Based Approach will be referred to as PBA throughout this article.

Project Based Approach

PBA is a student-centered pedagogy that highlights projects as being its vehicle in transmitting knowledge. What had me interested the most in PBA is that it features on teaching and learning what the students wanted to know, in other words, what they are curious about. Ann-Marie Clark (2006) who believes that children should be investigative about the environment around themselves and they should be given the opportunity to do so concluded that PBA is one of the best ways to do this (Clark, 2006). However at the same time, Clark (2006) also acknowledges that PBA is not an easy pedagogy to replicate especially by novice teachers, thus she planned out guidelines or the 5 processes that she believed should be included in the projects so that it could count as a genuine PBA. These are the 5 processes that she believed should be included; 1) develop their own questions about the topic under investigation, 2) make predictions about possible answers, 3) think of ways to test their hypotheses, 4) negotiate with the teacher various ways they might represent their findings, and 5) take time to solve their own problems through trial and error (Clark, 2006).

We were reviewing various literatures on PBA, we were inspired by a study done by Mitchell, Fougler, Wetzel and Rathkey (2009). With their own set of understanding on PBA, they tried to incorporate PBA within the curriculum without trying to leave out the curriculum standards behind (Mitchell, Fougler, Wetzel & Rathkey, 2009). Hence this drives us on exploring on whether PBA could be done within Brunei preschool context

Brunei Education System and Vision 2035

Brunei's current education curriculum termed as Sistem Pendidikan Negara Abad ke-21 (SPN-21) was first implemented in 2009. The introduction of this new curriculum becomes the start of a change in the education system, gearing into a more student centric learning rather than teacher centric. The curriculum was designed in a certain way that would help in achieving one of Brunei's visions for 2035 that is to produce well-educated and highly skilled generation of people (Organisation for Economic Cooperation and Development [OECD], 2014). The curriculum has presented different types of teaching methodologies in trying to achieve this vision and we personally believe that PBA could be a suitable pedagogy to be implemented in the preschool classroom. This is because PBA could develop 'children's high thinking skills such as problem solving, planning and self monitoring' (Brown & Champione, 1996) which inadvertently are some of the objectives listed under SPN-21.

PURPOSE OF THE STUDY

The purpose of this research is to explore PBA as a tool to stimulate children's curiosity. Secondly to examine children's reaction to PBA and thirdly, to explore and examine the challenges of implementing PBA into Brunei's preschool context

METHODOLOGY

We used the Commonwealth of Learning action research model as the framework of this study. We have opted to use this particular action research framework mainly because it helps to give us as researchers a clear guide on how to implement the research.

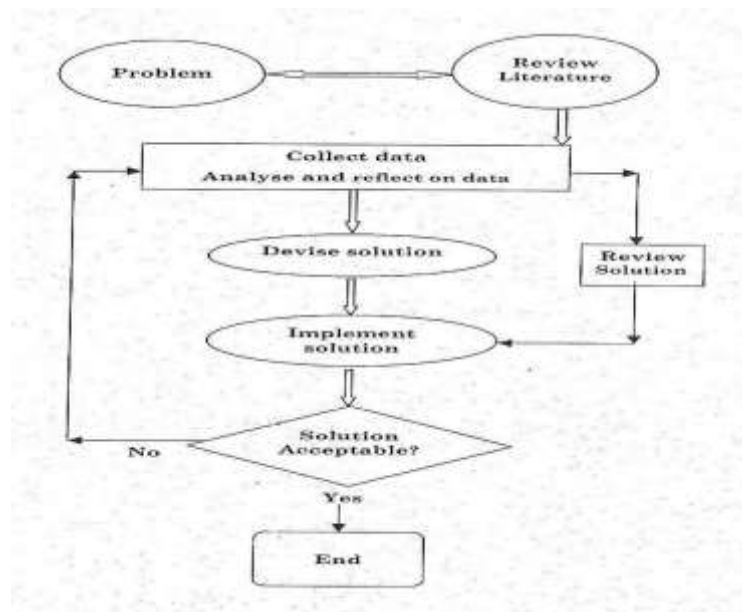


Figure 1: The Commonwealth of Learning action research model

Through using the above research model, after we have identified the problem that we are interested in, we would then read on the particular subject matter to have a deeper understanding on the problem. Afterwards we will collect the initial data and analyze whether it is a problem that is worth researching on and reflect on what should be done. With this data in hand, we could also try to devise a solution to try and tackle the issue and then to try and implement it. Like any other action research model, we would then reflect and review the solution to see whether it is adequate. If further clarification is needed then as being shown in the figure above the cycle starts again from recollecting the data and this is repeated until the solution is acceptable.

Sample

The research was carried out in a Preschool classroom of a Government Primary School located in Brunei Darussalam. The participants are aged around 4-6 years old at the time of research. There are 18 children in the classroom.

Data Collection

Data collection started with pre-intervention followed with during the intervention and at the end of the intervention. Data included field notes obtained from participant observation during the intervention and reflection diaries after each lesson. In addition, interviews are also conducted with the children and also the class teachers who were observing the lesson intervention. Video recordings were also taken during the intervention, which could provide more valuable data for the researcher as an assurance that no vital data would be missed out from the field notes. Furthermore, the video recordings allows the researcher could analyze the data at it's own leisure time to ensure a deeper understanding of the data (Edwards & Westgate, 1987). With the availability of the data from video recordings, the researcher is able to discern whether the children are showing their curiosity throughout the PBA intervention lessons. To help the researchers in identifying what should be identified as curiosity, Heswick's elements of curiosity would be used as a basis while writing the

field notes. Heswick has identified 14 mannerisms that people tend to project when they are curious (Heswick, 1964; Greenberger, 1969). The checklist used based on Heswick's elements of curiosity could be found in the Appendix 1.

During the intervention phase, 3 different thematic lessons are carried out using PBA according to what is set in the curriculum: (a) Plants Theme (Lesson 1), (b) Occupation Theme (Lesson 2), (b) My Toys Theme (Lesson 3)

FINDINGS

Before we started devising and implementing the lesson interventions, we spent about a week observing the classroom trying to get an understanding on whether and how curiosity is being stimulated within the classroom.

Lesson Intervention Data & Post Intervention Data Lesson 1 – Theme: My Plants [Project: Making a Flower]

Mind-mapping and curiosity. This stage was supposed to be the most important for us as researchers to explore as Project Based Approach boasted that it is through Mind-mapping that it could stimulate curiosity. Therefore when we started as teacher researcher we wanted to see how it would work. At the start of the lesson, it was already quite difficult for us to implement the mind-mapping exercise. The children took a long time to settle down in a circle so that we could start sharing ideas. When the mind-mapping started, they also looked confused and did not look quite ready to share their ideas. Some children also prefer to talk amongst themselves during the mind-mapping activity.

Children's reaction to PBA. When we first told the children that they are going to make a flower out of the materials that we have prepared for them, they did not look excited or happy to do it especially when we told them that they were going to work into 2 groups, the boys and the girls respectively.

They also had a hard time understanding that they had to discuss and create the flower themselves. They kept on going back to us and asking whether they have done it the 'correct' way, even though we have told them that it does not matter.

Throughout the lesson, we could see that the children are not working well together. Only a handful of the children worked on the flower themselves and the others only looked at their friends and around 3 children decided to make a flower on their own.

PBA and pre-school context. It was quite difficult for us to integrate the two concepts together. As we were given the Early Mathematics periods, we were supposed to make sure that we would follow and ensure that we would teach the children according to the lesson objectives stated in the scheme of work given to us by the school. When we tried to integrate the week's lesson objectives with the project, it seemed a little forced and not organic at all.

Researchers' reflection. By the end of the first lesson we were already feeling quite uneasy with introducing Project Based Approach to the children. From what we have observed we could see how they rely so much on their class teacher, and as being suggested in the literature review, for a PBA to be a genuine PBA, much of the work have to be done by the children themselves. The lack of curiosity that they have shown during the Mind-mapping exercise again worries us. If the sharing of ideas on how to make the flower could not enhance their curiosity on the particular theme, what is the best way to do it? However further reflection on the lesson itself, we realized that I did not follow Clark's 5 processes of PBA within this first intervention, which

could have been the reason why this intervention did not go as well as expected.

Before starting on the first intervention the researchers have this idealistic vision that as they are able to see and experience the different types of flowers, the children would be excited to go back into their classroom and share what they have learnt. We learnt that day that it is not as easy as we thought it would be. However still insisting that curiosity is important, we went back into the reading to see whether we have missed out any vital information.

Another problem that we had to tackle was to see and understand how we could integrate the curriculum's lesson objectives with the PBA pedagogy organically. we believe that we have spent more time thinking about what to do for the project in itself rather than thinking about how to integrate all of these three concepts together. Hence this time around we decided to start with understanding the lesson objectives are first and then trying to understand the ways where we could fit in the pedagogy and in the end the curiosity part within the lesson.

Lesson 2 – Theme: Occupation [Project: Making a Uniform]

Mind-mapping and curiosity. In comparison to the first intervention lesson, the atmosphere already seemed positive. Before the start of the mind-mapping exercise, they settled down faster than before and when they saw the mind-map written on the whiteboard they seemed to be ready with sharing their ideas. Almost all of the children participated especially in sharing the occupation of their parents. When we get onto asking the children what they know about the lesson objectives of the day, they were excited and through the mind-mapping exercise, we get to know that they already have knowledge on the lesson objectives which is why after they have finished sharing their ideas, they seemed to be restless once more.

However, after we pose the question that would become the premise of the project, we could see that slowly they are less disruptive and all of them become more attentive when we told them that they were going to make a soldier's uniform out of newspaper to test the theory.

Children's reaction to PBA. When we told them that they have to work in groups, this time around they were more ready to do it. There were fewer objections from the children when we asked each group to move to their designated tables.

We explained to the children that they have to do the first activity (measuring their neck) with the help of their friends and none of the children said anything. We could see that they are more willing to work with their friends as we see them helping their friends, ensuring that they got the measurement right.

When the second activity started (colouring the uniform), there were a bit of disagreement going on as most of the children wanted the 'green, brown and black' colour combination. However after much deliberation the children agreed that each group will have a different colour combination so that in the end, they were able to test their theory.

PBA & pre-school context. In the second intervention, after reviewing back the literature and understanding more of the lesson objectives, it was a little easier to find ways to integrate the two together. According to the lesson objectives, we were supposed to teach the children the numbers 11-15, this is why when we first tried to think of the project to do, we firstly tried to think of ways on how and where it would be possible to be integrated organically. Since the children had to learn about occupation and their uniform, we thought that we could do an activity so that they could not only learn the numbers, but also understand one of the uses of why we have to know and recognize numbers. This is done through the 'Measuring Neck' activity.

Researchers' reflection. In the second intervention, the outlook seemed much more positive than the first intervention lesson. The children thankfully showed a more positive reaction and that they seemed to enjoy the process of doing the project. The children seemed to have a better understanding on what they are doing in comparison to the previous lesson.

After much review of Ann Clark's processes and the lesson objectives, we realized that it might not be possible to replicate the entire Ann Clark's idea of PBA. Clark's idea of PBA begins with letting the children choose what they want to learn, and it is not possible in a Brunei's preschool classroom context. However, this does not mean that we cannot use Ann Clark's idea of PBA, it just means that some alterations are needed so that it could be suitable for Brunei's preschool context. What needed to be done is a deeper understanding on the processes so that we could still ensure that in some ways the method could be replicated.

Lesson 3 – Theme: My Toys [Project: Making a Toy Car]

Mind-mapping and curiosity. As the third lesson started, when they realized that it is our lesson and saw that again we have written a mind-map on the whiteboard, they began to settle down in a circle waiting for our further instruction. They also seemed ready to share what they know of the topic as they talked between their friends.

This time around, we brought a toy car with us to encourage the sharing of ideas. When they saw the car instantly everybody wants to say something. Most of them telling us that they have a toy car as well back at home. When we asked the children what they could observe from the toy car, all of them seemed excited to share anything they know. When the children started to share the reason why a car has 4 round wheels, we decided to use their theory as the premise of the whole project.

Children's reaction to PBA. As the third lesson came about, they were more excited to do the whole project. By this time they have already understood that we will assist them if they stumbled upon any difficulty thus they will try first before approaching me. They also prefer to discuss amongst themselves first before asking us.

Their peer collaboration is wonderful at this stage. As they understand that they have to work together to ensure that the process of making would go smoothly, they tend to help each other a lot. This is far different from when they first started.

We realized that as they are making the toy car, they will ask us why they needed to do this, which tells us that they are more curious about the process of making the toy car rather than the end product.

PBA and pre-school context. At this stage we have a better understanding on the processes of PBA and also the lesson objectives. It was easier for us to integrate the two concepts together. During this theme, we were asked to do a revision of the previous lesson objectives and thus picked 'shapes' as our lesson objective.

Researchers' reflection. During the third intervention, we were already quite confident with the whole process. The second intervention lesson has really helped us set the pace for this third lesson. This third intervention was done mainly because we wanted review whether the way the process that we went through in aligning the preschool lesson objectives and PBA could be duplicated. We felt again that the project and the lesson objectives were adapted quite naturally to each other.

DISCUSSION

The main purpose of this study was to explore and examine how PBA could be used as a pedagogy to stimulate children's curiosity in Brunei's preschool context. In particular, Ann Clark's (2006) definition of PBA is being used as a basis of this pedagogy. There are 5 intrinsic processes that Ann Clark suggested that would guide a teacher in ensuring that they are doing PBA: (1) develop their own questions about the topic under investigation, (2) make predictions about possible answers, (3) think of ways to test their hypotheses, (4) negotiate with the teacher various ways they might represent their findings, and (5) take time to solve their own problems through trial and error (Clark, 2006).

However as previously stated, in this study, the replication of Ann Clark's (2006) definition of PBA was already flawed from the beginning. Therefore this research tried to observe the 5 processes closely to comprehend what is the main concept that Clark has asserted in her definition of PBA. Looking closely at the words that she uses to describe her processes (develop, make predictions, negotiate various ways, trial and error) involves a lot of thinking. This lead the researchers to believe that through her definition of PBA that she is looking to improve the thinking skill of the children. This is also one of the main benefits of PBA that has been noted throughout various researches (Doppelt, 2003).

Therefore in this research, although the researchers could not entirely follow Clark's (2006) definition of PBA, it tried to at least make sure that in every stage of it's lesson activities and projects, it would ensure that a lot of thinking should be done by the children. Hence, to answer the main purpose of this study, based from the findings these three research questions needed to be answered and then further discussed below:

1. How PBA could be used to stimulate children's curiosity?

Through mind-mapping. According to Ann Clark's PBA (2006), much of the curiosity is driven by the mind-mapping exercise done at the start of every project in which students share their ideas on learning what they want to know. This is for a good reason as the premise of the whole project in PBA came from Mind-mapping. Therefore if the children are not interested in the topic then, there is a big possibility that the whole project would fail. This could be seen during the first intervention lesson. During the mind-mapping exercise during the first intervention lesson, the children did not show any mannerisms or signs of curiosity, which then lead to the failure of the first project.

However as stated above, this does not mean that it is impossible to implement the mind-mapping exercise, some alterations on the processes needed to be done. The problem that we have identified is the difficulty of expecting a theory from the children that would be the foundation for the whole project. We believe that one of the reasons for this based from our observations from the research is that they were not interested enough about the particular lesson objectives, which is difficult as much of what is taught in Brunei's preschool classroom is based on the lesson objectives. This then lead us to trying to find any adjustments that could be done during the mind-mapping exercise to accommodate the lesson objectives.

Wurdinger, Haar, Hugg and Bezon (2009) emphasizes on the importance of challenging students when it comes to devising a project, suggesting that it would enhance student's thinking skills when they have to navigate through the projects (Wurdinger, Haar, Hugg & Bezon, 2009). This research tried to replicate the idea of challenging students with the belief that it would also help in stimulating children's curiosity especially when it is a topic that the children feel that they already have knowledge on.

Through mind-mapping the teacher is able to know how much of the subject that the children already know and thus the teacher then have to amend the project in such a way that would be challenging for the children so that they would be more curious about it.

An example from the second intervention lesson displayed that the children were already confident about the issue of occupation and their various uniform that they lose their curiosity towards the end of the mind-mapping exercise. But when we ask them the question why the soldier's uniform is coloured the way it is, they become interested once more. And when we told the children that they are going to test this theory, they become curious once more and began to ask more questions on how they could try and make the uniform by themselves.

Materials used. According to Berlyne (1954) as stated in the literature review, one type of curiosity is evoked from visual, auditory and tactile stimulation (Berlyne, 1954). This type of curiosity could be seen throughout this research as when doing projects, various materials are used to accomplish it.

This could be seen during the second and third lesson interventions. During 'Measuring Neck' activity in the second lesson intervention, although we only used two main materials; the ruler and the newspaper, they were already showing signs of being curious. As they have not learnt how to measure using the rules beforehand, we decided to teach them first and all of the children observed me carefully, examining and noticing where we start and end the measurement.

During the third lesson intervention), when a group of children had the discussion on how to glue their toy car together showed how curious they are of the whole process as they tried to figure things out on how to do it the best way. This again showed us how introducing variety of materials to the children and let them navigate their way through it really helped in stimulating their curiosity.

Teacher's role in PBA. PBA has strictly emphasized that the projects have to be done by the children themselves and there is a good reason for it. From this research, we could see how children could benefit from this. The lack of specific instructions from us, made the children think more, experiment more and thus curious about the whole process and how they could handle it. This would not happen if we give out specific step-by-step instructions to the children. Teachers have to realize that in PBA they are merely an assistant or a coach to the children (Railsback, 2002).

This is displayed during the first lesson intervention. When one of the children came to us and asked how to attach the petals onto their flower, we were at that frustrated as more of the children kept on approaching me first rather than asking their friends. However, when one of his friends approached him and explained how they would be able to do it, we could see how curious he is and they started to try and experiment whether it would work or not.

Therefore before we give out the "answers" we have to assist the children first by asking them more questions first. Let them think about it or let them discuss it with their friends first so that they could be more curious about the project itself.

2) How does the children react to PBA?

At the very beginning we thought the reaction from the children were quite negative and the first lesson was quite a mess. The children were not concentrating and they were having trouble finishing up their projects. They were not even showing any signs of being curious of the projects. However as shown through the second and third interventions, after the small adjustment done during the Mind-mapping exercise, they began to enjoy doing the project. They even enjoy trying to solve problems on their own towards the end of the third lesson intervention lesson.

This positive reaction coming from the children shows that there is a place for Project Based Approach within Brunei preschool context. Towards the end of third intervention lesson, they reacted so positively to the pedagogy that they started to feel comfortable with the whole process. The children started to collaborate with

the friends better and they are more ready when it comes to sharing their ideas.

The children enjoyed it so much that when I interviewed the children and asked them what do they think about the project, they replied with, “It was fun! Can we do it again?”

3) How to implement PBA within Brunei’s preschool context?

Integration of lesson objectives and PBA. The problem that teachers tend to have especially when it comes to student centered pedagogy is the fact that student centered pedagogy makes it difficult for them to catch up with the lesson objectives presented in the curriculum. However, we believe this research has come to show that it is not impossible to integrate the two together.

This research shows that it is easier when a teacher understood what the lesson objectives are that week and try to align it with a suitable project for the children to do. we believe that it would be easier for teachers to think of a natural way to integrate the two together. Before thinking of a project, it is vital that the teachers should think about why the project would be profound for them. Krajick, McNeill and Reiser (2008) suggested that teachers should analyze each curriculum standards and lesson objectives and understand why the children should learn these ideas before trying to integrate it into PBA (Krajick, McNeill & Reiser, 2005).

This is what we tried to do during the Second and Third lesson intervention. Before trying to combine it together, we have to understand first the underlying reasons why children should learn about numbers or shapes. How can we show to them as teachers that these knowledge that they learn in school is applicable in real life and not merely knowledge they learnt from textbooks.

It is not only about teaching lesson objectives, it provides so much more. The problem some teacher might say is that the integration of the Lesson Objectives and the Project itself is exactly a traditional way of teaching. It would not provide the space for teaching children that emphasizes in getting higher grades for the children, but it does offer the children other important real-life skills (Bell, 2010).

One of the skills that the children learnt in PBA as demonstrated in this research is peer collaboration. As the lesson moves from the First to the Third and last intervention we could see how vastly the dynamics between the children have changed. The children started with not knowing how to react and work amongst their friends to finally being able to approach their friends themselves and discuss amongst themselves how they could finish the project.

Peer collaboration is important as we live in an interconnected world and collaboration cannot be escaped as we live in a highly specialized world. A study done amongst the youth showed that the young people believed that teamwork is one of the real life skills that should be taught in school (Fitzpatrick, Gogne, Jones, Lobley & Phelps, 2005).

CONCLUSION

Therefore to answer the main purpose of this study which is ‘How Project Based Approach stimulate children’s curiosity within Brunei’s preschool classroom context’, as the result and discussion of data comes to show, although it is possible, it was quite difficult to do so. Some adjustments had to be done to Clark’s 5 processes (2006) in what she constitutes to be important to PBA, but this as the research has shown had to be done. Thus showing that although it seemed impossible the first time around, all we had to do was to find the main ingredient that ties the whole pedagogy together, which honestly speaking did took a long amount of time and frustrations but it was all worth the troubles.

Yes, PBA is difficult to implement and awfully chaotic. However, what this study has also come to show that beneath all of the confusion and frustration, there is a lot that this pedagogy has to offer.

It showed that it could help in stimulating children's curiosity, which in this research showed to be a powerful agent in encouraging children to learn by themselves. Therefore teachers should not ignore curiosity and should use it to their best advantage. The set of lesson objectives that the teachers are expected to follow and the pressure from school should not be a reason for teachers not to encourage children's curiosity in school because as demonstrated by this research, albeit difficult, it could still be done.

At the same time, PBA also allows the children to be more confident, enhance their thinking skills, work well together with their friends and most importantly it provided the children with a meaningful lesson.

IMPLICATIONS

The underlying message from this whole research is the problem that has long been a contentious issue within the education realm. What is the best way to teach children? Do we remain with the teacher-centered way of teaching, where it would be easier for the teacher to take control of the whole lesson and concentrate only on the academic knowledge for the students? Or do we start teaching them with student-centered pedagogies where students are responsible for their own knowledge and teachers merely act as guidance as they navigate their way through their learning experience?

This brings us back to the introduction. What is education all about? In retrospection, education has always been about preparing us for our future. Back during the times of Industrialization, it is probably acceptable to use education just to impart knowledge to secure a good future, but now things are different. Time had moved on, circumstances have changed and thus our method have to change as well. In the 21st century, it will take more than knowledge for us to survive, skills have to be learnt so that we could adapt into the dynamic society. In today's society where most of the creative minds will prosper, we should not take in knowledge as it is, instead we have to understand it and try to apply it into something new. One of Brunei's Visions for 2035 is to produce highly educated and highly *skilled* generation of people. Therefore why should not we try and use PBA as a tool to scaffold children and students into developing these qualities?

RECOMMENDATIONS

1) Teachers have to be curious themselves

This research talks about the importance of curiosity and why as teachers we have to try and encourage it in our own practices. But we realize throughout the process of devising the intervention lesson is that as teachers we should approach things with a degree of curiosity as well. If we do not show to the children that we are curious about what they are doing, they would be reluctant to display what they are feeling to us.

2) Teachers have to be prepared

This comment actually came from the class teacher who was observing us during one of the lessons. She told us that as we are expecting the children to do the project themselves, we should prepare all the materials needed by them beforehand so that it would be easier for the children to work on their own.

3) Deeper understanding of the pedagogy is needed

Throughout this research, we have felt that we have not understood the pedagogy fully to do justice on PBA.

Therefore, we believe that teachers who would want to use PBA to have a much better understanding on the pedagogy first before attempting on using it. Attending seminars and workshops on PBA whenever possible is highly recommended as most of the time learning from theory is different from learning it practically.

4) Integration of different subjects

Unfortunately what we fail to do was to integrate different lesson objectives within one PBA lesson. We believe that it is possible and perhaps important to do so. Encouraging children's curiosity as discussed in many of academic publications, could be quite dangerous. This is because curiosity could also lead the children to try and experiment something that is bad as well. Therefore we would recommend that teachers who would want to try and do PBA, to integrate moral values as well. As the children are doing the project, the teacher could go around and talk to the children and share about the importance of avoiding doing something dangerous (for example when they are using scissors for different reasons), sharing with their friends and simply taking turns. This is probably the best set-up to do so as the children get to learn and the practice it at the same time.

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APPENDICES

Appendix 1 – Guidelines/Checklist for Heswick’s Elements of Curiosity

Elements of Curiosity (Heswick 1964)	Yes / No
Tends to wonder about, become fascinated by, a variety of things	
Has developed a long-term interest in a single task or project	
Examines, observes, notices carefully	
Gets excited, interested, when something new or unexpected is introduced	
Tries to figure things out	
Actually experiments, tries things out	
Often raises questions and problems	
Interrupts with questions during lessons	
Likes to try to solve problems	
Mould rather hear a new than a familiar story	
Tries to touch, or asks questions about the new or unexpected	
Loves to learn new things	
Doesn't mind working hard to find the answer to a question he has asked	
Likes to have his expectations about things disconfirmed	