STUDENTS' ENGAGEMENT IN 'DESIGN THINKING' FOR SCHOOL INNOVATION PROGRAMME: A CASE STUDY OF SBPI GOMBAK

BY

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ABSTRACT

The main objective of this research is to study students' level of thinking in posing questions for design thinking process. The other objective is to explore students' level of creativity in developing a draft prototype. In addition, this study also explores students' perceptions in design thinking programme. This research used purposive sampling. Twenty students aged thirteen and fourteen from Sekolah Berasrama Penuh Integrasi Gombak were chosen to conduct this research. The data collected through three aspects which are interview, observation and reflection. The interview data are then synthesized to understand better. The overall analysis indicates that students in SBPI Gombak were still not fully understand the design thinking process. From observation, teachers are more concern on teaching subject rather than allowing students to develop their creative thinking. Students' level of creativity can be reinforced if the group size is limited to six or fewer. Creativity of students is not achievable in design thinking process because students do not know which step to be used or in what situation should be used. It is also found that students got demotivated to integrate design thinking in their learning because of heavy school work load and syllabus.

ملخص البحث

الهدف الرئيسي من هذا البحث هو دراسة مستوى تفكير الطلاب في طرح الأسئلة لعملية التفكير التصميمي. والهدف الآخر يكمن في استكشاف مستوى إبداع الطلاب في تصميم النموذج المبدئي. علاوة على ذلك، فإن هذه الدراسة تلقي نظرة على تصوّرات الطلاب فيما يخصّ برنامج التفكير التصميمي. أخذت هذه الدراسة عيّنات بشكل هادف، حيث تم اختيار 20 طالبا تتراوح أعمارهم بين 13 و14 من مدرسة كومبق الداخلية المتكاملة (Sekolah Berasrama Penuh Integrasi Gombak) للمشاركة في هذا البحث. وقد تم جمع البيانات باستخدام 3 أدوات: المقابلة، والملاحظة، والتفكير. ثم يتم تجميع بيانات المقابلة لأجل فهم أوضح. أظهر التحليل العام أن طُلاب مدرسة SBPI جومباك ما زالوا لا يفهمون عملية التفكير التصميمي بشكل كامل. كما استنتج البحث من خلال الملاحظة أن المدرِّسين يعطون اهتمامًا أكبر لتدريس المادة على إعطاء الطلاب فرصة لتطوير تفكيرهم الإبداعي. أشار البحث إلى أنه يُمكن تعزيز المستوى الإبداعي للطلاب إذا تم تحديد حجم المجموعة لستة أفراد فقط أو أقل. ويتعذر تحقيق إبداعية الطلاب في عملية التفكير التصميمي لجهلهم بالخطوات التي ينبغي عليهم اتباعها، أو بالمواقف التي تتطلب استخدام إبداعهم فيها. وتبيّن من البحث كذلك أن الطلاب يشعرون بفقدان الدافعية لدمج التفكير التصميمي في تعلمهم وذلك بسبب الضغوط المدرسية والمقرر الدراسي الثقيل.

APPROVAL PAGE

I certify that I have supervised and read this study and that in my opinion, it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Master of Education.

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Suhailah Hussien
Supervisor

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Master of Education.

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DECLARATION

I hereby declare that this dissertation is the result of my own investigations, except where otherwise stated. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at IIUM or other institutions.

Nazatul Syirin Binti Mohammad Mokhtar

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF THE STUDY

It is becoming more and more evident that educators encounter numerous challenges in order to cater to good learning for their students and prepare themselves for the rapidly changing world. They would like to see that the graduates of the education system are able to perform various responsibilities with more confidence and efficiency. Innovative approaches have also become a major concern in recent years because creativity and innovation are important tools for students to express themselves in terms of emotional development and also communication. According to Ginsburg (2007), creative expression is important to a child's development. Therefore, that is why teachers need to find ways to allow their students to be creative and inspire them with new ideas and concepts.

Undeniably, a number of inspirational educators have changed their ways of teaching in order to make their students more creative. However, most of their great ideas and innovations fail due to the incorrect way of implementation. Teachers do not have proper and structural approaches which minimise the chances of success of their new practices and ideas in the classroom. Good structural approaches such as Design Thinking can be an effective tool for teachers to improve their practice and students' learning outcomes. The problems faced by society today are very complex, therefore, more creative solutions are needed (Cole, 1999).

Design thinking was introduced by Peter G. Rowe in 1987. Numerous scholars such as Richard Buchanan, Tim Brown, and Nigel Cross played a vital role in developing the concepts and theories of design thinking. Design thinking is not just a

process of brainstorming but is more than that. It helps in seeking insights, develops multiple creative solutions that can lead to possible outcomes and solutions. A number of studies have highlighted that design thinking practices can help students from all fields in gaining skills such as creative thinking, communication, and teamwork. In another study conducted by Dukes and Koch (2012), design thinking is a great tool that enhances students' capabilities. From time to time, students will be able to familiarise themselves with design thinking tools. Wagner, and Chan (2017) argue on the use of design thinking concepts in medical education. Both writers use the five stage process of discovery, interpretation, ideation, experimentation, and evolution with specific cases in medical education. In another research by Bissola, Imperatori, and Biffi (2017), they highlight the successfulness of design thinking in promoting and enhancing entrepreneurial capabilities. Mosely, Wright, and Wrigley (2018) applied design thinking concept to non - designers where the results came up to show positive impact on their learning experience.

Similarly, in Malaysia, the 21st century has brought many challenges to the education system. The Malaysian education system keeps on experiencing changes and reviews in order to meet education policies (Pihie, Asimiran, & Bagheri, 2014). One of the aims of education is to help students to develop their thinking skills. According to Rosnani and Suhailah (2003), most studies in the past have proven that the ability of students to think well has been declining, especially when schools start to focus on the mastery content rather than the process of deriving it. Memorising and taking orders are part of the culture in the East (Mohd Dom, 2008). Because of this, a good and effective way to teach thinking skills must be figured out.

In September 2013, the Ministry of Education Malaysia launched Malaysia Education Blueprint 2013-2025 where a lot of transformations have been done starting

from students, teachers, and instructional leaders. The decision was made in order to have international education standards and to prepare students for the needs of the 21st century. In order to properly prepare students for the needs of the 21st century, it is important for the education system to be well accomplished so that Malaysia can perform well at the international level just like other countries. In order to build students with problem-solving skills and prepare them for college and careerwise, skills such as design thinking and teamwork should be enhanced (Rotherham & Willingham, 2009; Shute & Torres, 2012).

The Ministry has prepared 11 shifts that have their own roles respectively. Some of the shifts represent a change in strategy and direction. Under the first shift, the Ministry launched the Secondary School Standard Curriculum or *Kurikulum Standard Sekolah Menengah* (KSSM) and revised the Primary School Standard Curriculum or *Kurikulum Standard Sekolah Rendah* (KSSR). This curriculum stresses knowledge and skills such as creative thinking, innovation, problem-solving, and leadership.

Hence, it is important for the education system to help teachers to understand better about their roles. It is also crucial for researchers to conduct studies that can reveal the right way and techniques to facilitate better understanding for students so that the mission and vision of the latest Blueprint could be achieved. The infusion of CCTS (Critical and Creative Thinking Skills) was introduced in KBSM (Integrated Curriculum for Secondary Schools) in order to produce students who are good in rational, critical, and also creative thinking.

Although there are a lot of studies conducted on critical thinking skills, the number of studies conducted on creative thinking and innovation are still limited because these thinking skills are rarely conducted and introduced in Malaysian

schools. One of the creative thinking programs conducted in Malaysia is the Gifted program. However, this program is not well structured and organised, which is why not much attention is given to this program. On the other hand, design thinking is a well-structured programme. According to our Prime Minister Datuk Seri Najib Tun Razak, Malaysians should quickly embark on Design Thinking as the small step towards securing incremental increases of the aspiration, which was one of the goals set under the National Transformation 2050. If design thinking is well implemented in Malaysia, its culture could be the norm for future generations.

Indirectly, this research provides an insight that creativity such as design thinking is important for the Malaysian educational context. Design thinking can be a great module as it helps in creating ideas and finding good solutions that are novel (Lindberg et al., 2010). It clearly shows that design thinking would create a good future for the Malaysian education system.

1.2 STATEMENT OF PROBLEM

In this era of globalisation, the role of teachers is very essential in order to meet the demands and needs of 21st-century teaching and learning. 21st-century curriculum must give full attention to the development of knowledge and encourage students to enhance new skills. In order to prepare the students with the new world, a good curriculum is important to support their participation, motivation, and also understanding (Lambordi, 2007). Teachers are expected to help students in becoming a person who thinks critically and creatively. In support of this, the Malaysian Ministry of Education always encourages educators to study and learn more in critical, creative, and relevant areas.

In addition, the Ministry of Education has launched its blueprint 2013-2025 in line with the government's aspiration to prepare students to meet the needs of the 21st century. One of the 11 strategies that have been introduced is creative, innovative, and critical thinking skills; this is somehow in line with 'design thinking'. However, there is an issue in its implementation. The focus of our teaching and learning in school is more towards examination-oriented and results-based. Learning becomes less meaningful due to a large number of the syllabus that needs to be finished within a year. Consequently, teachers could not provide them with valuable learning such as design thinking.

According to Brown and Wyatt (2010), 'design thinking relies on our ability to be intuitive, to recognise patterns, to construct ideas that have emotional meaning as well as being functional'. It is actually a problem-solving process that embedded three crucial parts; analytical thinking, creative thinking, and practical skills (Vanada, 2011). In order to meet the needs of 21st-century learning, design thinking can be a great tool to be used in the education field as it helps a person to solve problems and make decisions (Ray, 2012). Despite the downfall of the level of thinking skills among students as highlighted by researchers in Malaysia, the government has constantly revised and amended the policy and systems.

One of the creative programmes that are offered in some schools in Malaysia is the Gifted Programme. It is a programme which aims to prepare youth in terms of intellectual, creativity, and values. The programme is not intended to create a place for elite students, but to motivate those who are already outpacing their peers. Unfortunately, it can be seen that the Gifted programme in Malaysia has not received enough attention. This is because the module of the programme is not well-structured and not enough evaluations have been conducted to test the effectiveness of this

programme. Moreover, teachers have insufficient knowledge of the Gifted programme since they do not get proper training or any enrichment programmes to conduct this programme.

In this case, design thinking could be a selection to be introduced in school since it has a well-structured process that consists of five stages. By applying design thinking into school academic content, students could enhance skills that are not based on traditional school settings with the help of teachers. This process would educate them into different levels of creative knowledge, creative skills, and creative mindsets that can be achieved by design thinking education, resulting in a capability that is called "creative confidence" (Rauth, I. et al, 2010; Carroll et al, 2010). According to Gralewski and Karwowski (2019), there is a close association between students' divergent thinking and creativity. This somehow can be a stepping-stone for them to be innovative. Hence, this study aims to examine how students of Sekolah Berasrama Penuh Integrasi Gombak (the nearest school to IIUM) engage themselves with the design thinking process for the school innovation programme.

1.3 OBJECTIVES OF THE STUDY

The purpose of this study is to explore the engagement of students in design thinking programme conducted in school. Hence, the fulfilment of the objectives as listed below would provide beneficial insight for teachers and curriculum makers in helping them to become good design thinkers:

i. To identify students' level of questions for the Design Thinking process.
ii. To explore students' level of creativity in developing a draft prototype.
iii. To explore students' perceptions in the Design Thinking programme.

1.4 RESEARCH QUESTIONS

To address the stated objectives, the following three research questions are posed:

i. What is the students' level of questions during the Design Thinking process?

ii. What is the students' level of creativity in developing a draft prototype?

iii. What are the students' perceptions of the Design Thinking programme?

1.5 SIGNIFICANCE OF THE STUDY

The insight and findings of this study can benefit the policymakers, curriculum designers, principals, and teachers in applying the innovation programme in school to inculcate design thinking among students. By implementing design thinking in the curriculum content, automatically traditional classroom settings could be minimised because it encourages students to see problems deep down from an issue and make thinking essential to solve any problem (Barseghian, 2009). This is in line with Malaysia's curriculum goal to have students who are creative and innovative in this 21st-century education since design thinking deals with these issues with an in-depth evaluative approach which is useful for any problems that occur.

Furthermore, not much attention is given to innovative programmes conducted in schools in Malaysia, so this could be a great starting point in identifying how an innovation programme particularly design thinking can be developed in Malaysian schools. This study can also help teachers to enrich their roles at school in adjusting their teaching methods and strategies to enhance the students' design thinking. The fulfilment of these objectives would also provide beneficial insight for society as a whole since design thinking can be practiced by everyone.

Design thinking gives attention to end-users. Things are designed not because it looks good or trendy or even to gain profit, but they are designed to meet consumers' needs and expectations. To sum up, design thinking is a process that incorporates thinking and flexible which can be integrated into any field or discipline (Vanada, 2011).

1.6 THEORETICAL FRAMEWORK

The uniqueness of this research underlies its theoretical framework in which their thinking skills are analyzed through higher order and lower order thinking skills. In order to provide a brief framework for teachers with the aim of having a better understanding for application, a framework incorporating all the important thinking skills, process and constructs is provided. Teachers need to learn and understand how they relate to each other to avoid confusions on the overlapping of these skills and processes which seem to discourage teachers from teaching thinking skills.

Two major thinking categories incorporating various other thinking skills are the critical and creative thinking categories. The major categories of thinking skills which become the root for these categories are the higher-order and lower-order thinking skills. These skills, then lead to decision making and problem solving.

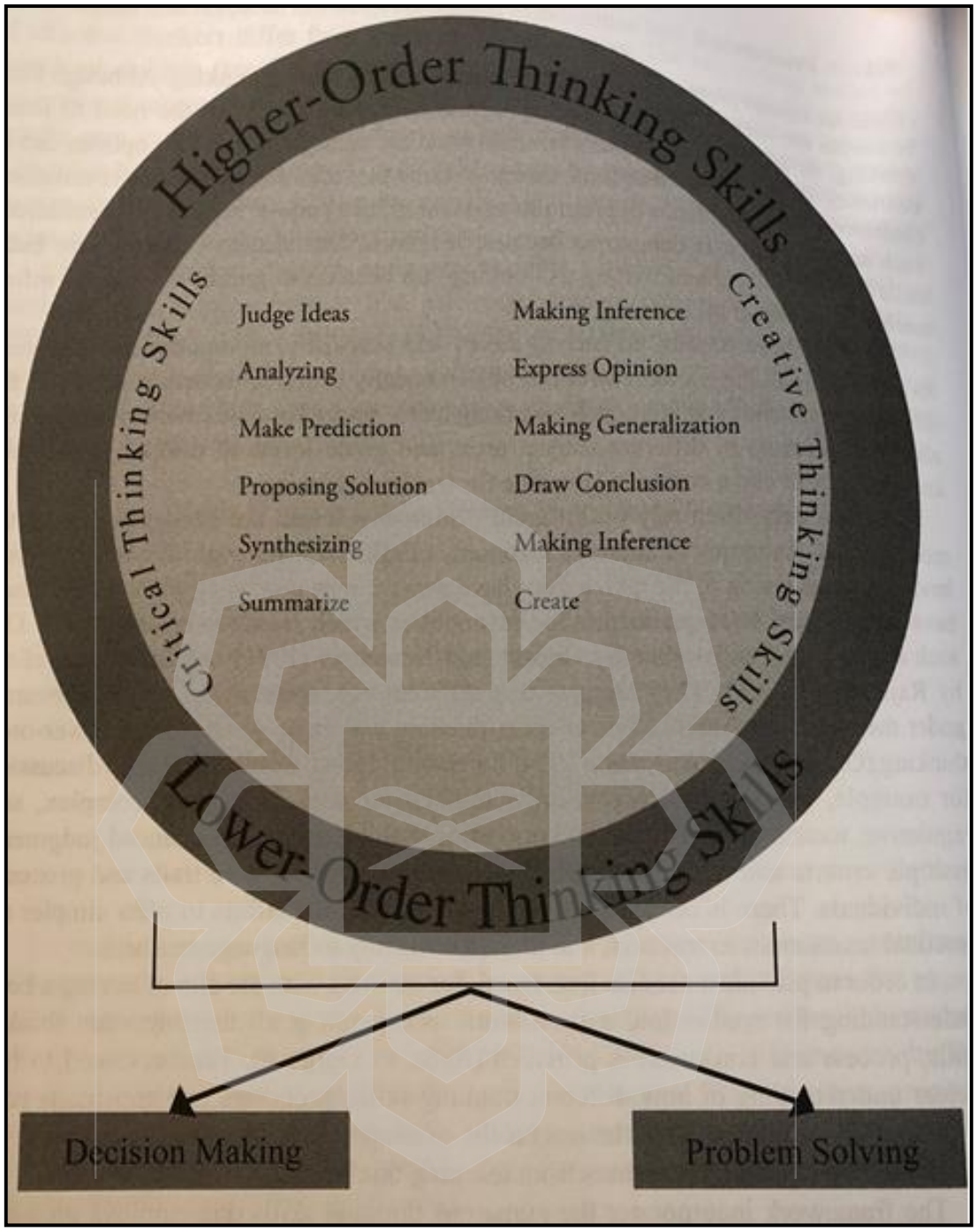

Figure 1.1 Framework of Thinking Skills

1.7 DELIMITATIONS OF THE STUDY

The following are the delimiting factors that characterized the study:

i. In terms of ***design***, the study at the very onset sets out to employ purely qualitative research design specifically case study as its research method. The exploratory case study is chosen to have a deep understanding of the real implementation and outcomes.

ii. In terms of ***samples***, the study restricted its choice of participants to twenty students from SBPI Gombak who are already involved in the innovative club established by the school. The students are Form 1 and Form 2.

iii. In terms of the nature of ***the geographic region***, the study restricted its choice to only Sekolah Berasrama Penuh Integrasi Gombak since it is the nearest school to IIUM and has a good collaboration with the Centre for Teaching Thinking, Kulliyyah of Education.

1.8 OPERATIONAL TERMS

The following terms are used for measurement and assessment in the study:

1.8.1 Design Thinking

In the field of education, design thinking can be defined as an approach to learning which focuses on problem-solving and inquiry that involves hands-on learning projects, investigation of possible solutions, sketching and prototyping, collaboration and feedback, created 'products' or ideas as well as reflection and redesigns if necessary (R. Razzouk & Shute, 2012).

1.8.2 Innovation

Innovation is the development of creativity and ideas, the starting of new and improved products, services, and work where it encompasses both creativity and innovation implementation (West, 2002).

1.8.3 Student's Engagement

Student engagement can be defined as "participation in educationally effective practices, both inside and outside the classroom, which leads to a range of measurable outcomes" (Kuh et al., 2007).

1.8.4 SBPI Gombak

Sekolah Berasrama Penuh Integrasi Gombak is a boarding school that has won several international awards (a sector under the Ministry of Education Malaysia). It is located in Sungai Pusu, Gombak, the nearest school to IIUM. This school has shown outstanding achievements in both academic and co-curriculum.

1.9 CHAPTER SUMMARY

Generally, this chapter discussed on Malaysian education context together with its challenges in facing 21st-century teaching and learning. It has also discussed design thinking, a tool that can be beneficial to students if it was implemented in school. Design thinking focuses on building children's creative confidence through activities that can enhance their skills in empathy, ideation, and problem-solving. Basically, the study attempts to look at the perspective of students in understanding the concept of design thinking and the challenges they face while going through the process. It also aims to look at affective elements that impact design thinking in a classroom

environment. Thus, this chapter has outlined the research objectives, research questions to investigate, the significance of the study, delimitation of the study, and terms of definitions that have shaped the major constructs of this research.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

The purpose of reviewing the literature is to analyse, review, and synthesise the existing research regarding Students' Engagement in Design Thinking and School Innovation Programme in Malaysia. Thus, this chapter comprises of the meaning and conception as defined by the previous scholar and research namely, (i) Innovation Programmes in Malaysia Education; (ii) The Concepts of Design Thinking; (ii) Evolution of Design Thinking (iv) Key Features of Design Thinking.

2.2 INNOVATION PROGRAMMES IN MALAYSIA EDUCATION

Malaysia is a country that is developing rapidly in line with other big countries. To sustain this development, the Ministry of Education has drafted several plans that could serve as a platform to enhance the quality of education in Malaysia. The 21st-century education demands transformation in teaching so that students will be able to face challenges by applying their high-order thinking skills. Malaysia aims to become a developed nation in achieving vision 2020. Due to this country's aspirations and goals, teachers play an important role in producing students who are able to compete and enhance the country's economy.

An excellent teacher will prepare himself or herself to face the wave of globalisation that is constantly overwhelming. Teachers today should change the way they think from conventional ideas to a more creative and innovative approach. Nowadays, various facilities and infrastructures have been provided by the ministry to encourage teachers to become more innovative. A creative teacher is based on the way