

UNIVERSITI TEKNOLOGI MARA

**THE DEVELOPMENT AND
EVALUATION OF A DESIGN
THINKING MODULE TO
FACILITATE CREATIVITY AMONG
LOWER SECONDARY SCHOOL
STUDENTS**

ADILA BINTI MD HASHIM

Thesis submitted in fulfilment
of the requirements for the degree of
Doctor of Philosophy
(Education)

Faculty of Education

September 2023

ABSTRACT

This study focuses on developing a design thinking module to facilitate creativity among lower secondary school students. The module development is to overcome students' lack of creativity in creating solutions to real-world problems. The study adopted the Design and Development Research in three phases: needs analysis, design and development, and evaluation. A structured interview was used with nine lower secondary school teachers in phase one to identify the needs to develop the module. Content analysis was utilised to determine the relevant themes. As mentioned by the teachers, there is a lack of creativity among lower secondary school students. They also mentioned that design thinking can facilitate students' creativity and agreed that a design thinking module is needed to guide students in executing design thinking in schools. During the second phase, a semi-structured interview based on phenomenology was conducted face-to-face with four design-thinking practitioners. The interview transcripts were analysed using thematic analysis to decide the content of the module. It was further selected using the design thinking content selection instrument by eight teachers experienced in implementing design thinking in schools. The data was then analysed using the Fuzzy Delphi method to determine experts' consensus on suitable content for lower secondary school students. Once the design thinking module was developed, the four stages of Tessmer formative evaluation were performed to measure and improve its usability. The first stage was conducted with two creativity experts via email. The second stage was conducted face-to-face with two teachers and two students. The third and fourth stages were implemented at a secondary school with eight and thirty-two lower secondary school students, respectively. They used the module to apply design thinking in an actual environment. It was found that the usability of the design thinking module was first rated at 3.76, followed by 3.63 in stage two and 4.43 in stage three. The final usability of the design thinking module was rated at 4.27, indicating good. Meanwhile, students' creativity was assessed based on three indicators; think creatively, work creatively with others and implement innovations. The data retrieved during the formative evaluation's third and fourth stages were based on creativity observation while students executed design challenges. Based on the findings, it can be concluded that the design thinking module can facilitate lower secondary school students' creativity and be used as a guide in executing the design thinking approach in schools with close supervision of teachers.

ACKNOWLEDGEMENT

First and foremost, praise Allah S.W.T. for His blessings in making this thesis a success.

Firstly, my sincere gratitude and utmost appreciation to my main supervisor, Associate Professor Ts Dr Sharipah Ruzaina Syed Aris, for her invaluable guidance, continuous constructive ideas, and intellectual advice in the preparation and completion of this thesis. My sincere appreciation and thanks to my co-supervisor, Professor Dr Chan Yuen Fook for his guidance, advice, and assistance in the completion of this thesis.

Secondly, my special thanks to the validation panel members for their assistance and generously allocated time and energy to assure my study instruments were valid and reliable. I would also like to extend my deep gratitude to the expert panel members in three phases of the Design and Development Research (DDR) method that has helped me in this study. My special gratitude to the Ministry of Education and the Selangor Education Department for the approval given in conducting this study. My thanks also go to the respective principal, teachers, and students of the secondary school where this study was held for their cooperation, participation, and support in this study.

Finally, my heartfelt thanks to my parent, M Hasim Jalani and _____, who has been very supportive since the conception to further my studies at the doctorate level. My appreciation also goes to my husband, Rasnijeery Mat Rashid. He has shown me support, tolerance, and a pillar of strength throughout this challenging period. Last but not least, I would like to thank my children and siblings for being understanding and patient that had given me the drive and courage. Alhamdulillah.

TABLE OF CONTENTS

	Page
CONFIRMATION BY PANEL OF EXAMINERS	ii
AUTHOR’S DECLARATION	iii
ABSTRACT	iv
ACKNOWLEDGEMENT	v
TABLE OF CONTENTS	vi
LIST OF TABLES	x
LIST OF FIGURES	xiii
LIST OF ABBREVIATIONS	xv
CHAPTER 1 INTRODUCTION	1
1.1 Research Background	1
1.2 Problem Statement	5
1.3 Research Objectives	9
1.4 Research Question	10
1.5 Significance of Study	10
1.6 Scope of the study	13
1.7 Assumption and Limitation of the study	14
1.8 Operational definitions	15
1.9 Summary	16
CHAPTER 2 LITERATURE REVIEW	19
2.1 Introduction	19
2.2 The 21st Century Skills	20
2.3 Theories of Creativity	24
2.3.1 The Four Ps of Creativity (4Ps)	26
2.3.2 Creativity Indicators for 21st Century Skills	33
2.3.3 Creativity of Lower Secondary School Students	37
2.3.4 Assessing Creativity	40
2.4 Design Thinking Approach	46

CHAPTER 1

INTRODUCTION

1.1 Research Background

Imagine a classroom where students roam freely to pick up tools and materials and not hesitate to build something from scratch. The students follow their inquiries, create meaningful works, and intentionally utilize various equipment as learning tools. They try to finish the task as soon as possible and have a sharing session with their classmates and the teacher to gain feed-forward feedback. The students also collaborate, and the teacher only acts as a facilitator throughout the activity. It is the visual image of 21st century creative learning environment setting which concentrates on active engagement for transformative learning experiences (Henriksen et al., 2016; Trainor, 2014).

Creative education is grounded in the belief that fostering creativity is essential for personal growth, innovation, and adaptability in a rapidly changing world. It promotes the development of personality, critical thinking, and the ability to generate original ideas (Tudor, 2008). This philosophy views creativity as a fundamental aspect of human nature that can be nurtured and cultivated through education. Education today is more complicated and challenging compared to 50 years ago. In order to face the challenges, the Ministry of Education Malaysia (MoE), 2013 focused on the need to nurture 21st century skills. The inculcation of 21st century learning describes the student-centred learning process based on five key elements, which are communication, collaboration, critical thinking, creativity, and the application of positive attributes and ethical values (4C1V) (Ministry of Education Malaysia (MoE), 2018).

21st century learning defines the pertinent knowledge and skills students should possess to be competitively relevant and empowered to take on the 21st century learning challenges. The need for 21st century learning contributes to the future competitiveness and success of a nation in the global marketplace. Workforce skills and demands have rapidly changed in the last 20 years. The students need to be equipped with relevant skills that suit today's job market requirements (Julaihi & Hamdan, 2019).