

**UNDERSTANDING THE READING RESPONSES  
AND CREATIVE PROCESSES THROUGH  
DIGITAL STORYTELLING AMONG READERS  
WITH DIFFERENT READING ACHIEVEMENTS IN  
A UNIVERSITY**

**ROFIZA BINTI ABOO BAKAR**

**UNIVERSITI SAINS MALAYSIA  
2015**



**UNDERSTANDING THE READING RESPONSES  
AND CREATIVE PROCESSES THROUGH  
DIGITAL STORYTELLING AMONG READERS  
WITH DIFFERENT READING ACHIEVEMENTS  
IN A UNIVERSITY**

**by**

**ROFIZA BINTI ABOO BAKAR**

**Thesis submitted in fulfillment of the requirements  
for the degree of  
Doctor of Philosophy**

**September 2015**

## ACKNOWLEDGEMENTS

Alhamdulillah, all praises be to Almighty Allah, the most merciful and the most benevolent for granting me the fortitude to embark on this journey.

This work would not have been completed without the support of many individuals whose kindness I have to acknowledge here. First, my appreciation goes to the main supervisor of this research, Associate Professor Dr Hairul Nizam Ismail, for his endless guidance, encouragement and help in my study. Second, I am truly indebted to Dr Aswati Hamzah who did not only provide her insight and expertise, but also reassuring words in difficult times. I am also thankful to the respondents of this study for their willingness to participate in the study and for teaching me what reading and creativity really are. I cannot possibly name everybody else who has helped me but my loving thoughts are always with them.

I would also like to express my forever thanks to my beloved mother and my late father whose lives have been devoted to the happiness of others, especially me.

Not forgetting, my deepest and utmost gratitude goes to my better half who has provided me continuous support and motivation, and who is the source of my strength and contentment.

Last but not least, this thesis is affectionately dedicated to the remembrance of Wildan whose laughter and joy I have not had the chance to witness; maybe in the hereafter.

## TABLES OF CONTENTS

	<b>Page</b>
<b>ACKNOWLEDGEMENT</b>	ii
<b>TABLE OF CONTENTS</b>	iii
<b>LIST OF TABLES</b>	x
<b>LIST OF FIGURES</b>	xii
<b>LIST OF ABBREVIATIONS</b>	xiii
<b>LIST OF APPENDICES</b>	xv
<b>ABSTRAK</b>	xvii
<b>ABSTRACT</b>	xix
<b>CHAPTER ONE - INTRODUCTION</b>	
1.0 Introduction	1
1.1 Background of the Study	6
1.2 Statement of the Problem	10
1.2.1 The Reading Difficulties in Expository Texts among Engineering Students	10
1.2.2 The Lack of Creativity Skills among Engineering Students	14
1.3 Objectives of the Study	18
1.4 Research Questions	18
1.5 Rationale of the Study	19
1.6 Significance of the Study	22
1.7 Limitations of the Study	24
1.8 Definitions of Terms	24
1.8.1 Digital Storytelling	25
1.8.2 A Digital Story	25
1.8.3 Reading	25
1.8.4 Reading Responses	26
1.8.5 Cognitive Elements in Reading	26
1.8.6 Metacognitive Elements in Reading	26

1.8.7	Affective Elements in Reading	27
1.8.8	Readers with Different Reading Achievements	27
1.8.9	An Above-average Reader	27
1.8.10	A Below-average Reader	28
1.8.11	The Reading Placement Test	28
1.8.12	Expository Texts	29
1.8.13	Creativity	29
1.8.14	Creative Process	29
1.9	Conclusion	30

## **CHAPTER TWO – LITERATURE REVIEW**

2.0	Introduction	33
2.1	Digital Storytelling	34
2.1.1	The Need for Digital Storytelling	35
2.1.2	Previous Studies on Digital Storytelling and the Pathway for Future Research	38
2.1.3	The Relationship between Reading and Creative Processes in the Context of Digital Storytelling	43
2.1.4	The Seven Elements of Digital Storytelling	46
2.1.4(a)	Element 1: The Point of View	47
2.1.4(b)	Element 2: A Dramatic Question	47
2.1.4(c)	Element 3: An Emotional Content	48
2.1.4(d)	Element 4: The Gift of Voice	48
2.1.4(e)	Element 5: The Power of Soundtrack	49
2.1.4(f)	Element 6: Economy	49
2.1.4(g)	Element 7: Pacing	50

2.2	Reading	51
2.2.1	Reading Responses	52
2.2.2	The Above-average and Below-average Readers	56
2.2.2(a)	The Identification of the Above-average Readers and Below-average Readers	56
2.2.2(b)	The Characteristics of the Above-average and Below-average Readers	59
2.2.3	Rosenblatt's (1978) Reader-response Theory	61
2.2.4	The Connection between Rosenblatt's (1978) Reader-response Theory and the Cognitive, Metacognitive and Affective Elements in Reading	62
2.2.4(a)	Cognitive Elements in Reading	63
2.2.4(b)	Metacognitive Elements in Reading	71
2.2.4(c)	Affective Elements in Reading	74
2.2.5	The Relationships among the Seven Elements of Digital Storytelling, the Cognitive, Metacognitive and Affective Elements in Reading, and Rosenblatt's (1978) Reader-response Theory	77
2.3	Creativity	79
2.3.1	Wallas' (1926) Creative Process Model	81
2.3.2	Lindstrom's (2006) Creative Process Criteria	82
2.3.3	The Similarities between Wallas' (1926) Creative Process Model and Lindstrom's (2006) Creative Process Criteria	83
2.3.4	The Creative Processes which may be Exhibited while Applying the Seven Elements of Digital Storytelling	85
2.4	The Relationships among the Seven Elements of Digital Storytelling, the Cognitive, Metacognitive and Affective Elements in Reading, and Creative Processes	90
2.5	Studies Related to Creative Process	92
2.6	Theoretical Framework	95
2.7	Summary	98

## **CHAPTER THREE – METHODOLOGY**

3.0	Introduction	100
3.1	Research Design	100
3.2	Sample Selection	103
3.2.1	Sampling Technique	103
3.2.2	Respondents	104
3.3	Research Instruments	104
3.3.1	The Reading Placement Test	105
3.3.2	The Expository Reading Texts	106
3.3.3	The Digital Story Grading Rubric	106
3.3.4	The Creative Process Grading Rubric	107
3.3.5	The Classroom Observational Instrument	108
3.3.6	The Interview Instrument	109
3.4	Data Collection	110
3.4.1	Classroom Observations	110
3.4.2	Interviews	111
3.4.3	Document Analysis	116
3.4.3(a)	Reading Log Worksheets	117
3.4.3(b)	Digital Storytelling Elements Worksheet	119
3.4.3(c)	Storyboard	120
3.4.3(d)	Student Journal	121
3.4.3(e)	Digital Stories	122
3.5	Triangulation of Data Collection Methods	123
3.6	Pilot Study	123
3.6.1	The Analysis of the Pilot Study Data	124



3.6.2	Case/Subject 1: Mizzi (An Above-average Reader)	124
3.6.2(a)	Mizzi's Reading Responses	125
3.6.2(b)	Mizzi's Creative Processes	129
3.6.2(c)	Mizzi's Level of Reading Responses	130
3.6.2(d)	Conclusion	131
3.6.3	Case/Subject 2: Alif (A Below-average Reader)	132
3.6.3(a)	Alif's Reading Responses	132
3.6.3(b)	Alif's Creative Processes	135
3.6.3(c)	Alif's Level of Reading Responses	138
3.6.3(d)	Conclusion	139
3.6.4	The Cross Analysis of Cases	139
3.7	Research Procedures	142
3.8	Data Analysis	150
3.9	Research Matrix	155
3.10	Validity and Reliability in Qualitative Research	156
3.11	Research Ethics	157
3.12	Summary	159

## **CHAPTER FOUR – DATA ANALYSIS AND RESULTS**

4.0	Introduction	161
4.1	The Profiles of the Respondents	161
4.2	The Identified Themes for the Study	164
4.3	The First Research Question	166
4.3.1	Reading Responses in Relation to Cognitive Elements	167
4.3.2	Reading Responses in Relation to Metacognitive Elements	176

4.3.3	Reading Responses in Relation to Affective Elements	184
4.4	The Second Research Question	189
4.4.1	The Level of the Reading Responses	190
4.5	The Third Research Question	196
4.5.1	The First Stage of Creative Process: Preparation	196
4.5.2	The Second Stage of Creative Process: Incubation	203
4.5.3	The Third Stage of Creative Process: Illumination	205
4.5.4	The Fourth Stage of Creative Process: Verification	207
4.6	The Fourth Research Question	212
4.6.1	The Levels of the Creative Processes	212
4.7	The Summary of the Findings of the Study	224

## **CHAPTER FIVE – DISCUSSION AND CONCLUSION**

5.0	Introduction	226
5.1	The Summative Findings of the Study	226
5.2	Discussion on the Findings	231
5.2.1	Discussion on the First Research Question Findings	231
5.2.2	Discussion on the Second Research Question Findings	240
5.2.3	Discussion on the Third Research Question Findings	241
5.2.4	Discussion on the Fourth Research Question Findings	247
5.3	Research Implications	250
5.3.1	Research Implications to Theory	250
5.3.2	Research Implications to Educational Practices	254
5.4	Recommendations for Future Research	256
5.5	Conclusion	258

<b>REFERENCES</b>	261
<b>APPENDICES</b>	280

## LIST OF TABLES

		<b>Page</b>
Table 2.1	The summary of the relationship between reading and creative processes in the context of digital storytelling	45
Table 2.2	The summary of the seven elements of digital storytelling	50
Table 2.3	The relationship between the cognitive, metacognitive and affective elements in reading and the reader-response theory (Rosenblatt, 1978)	76
Table 2.4	The relationships among the seven elements of digital storytelling, the cognitive, metacognitive and affective elements in reading, and Rosenblatt's (1978) Reader-Response Theory	78
Table 2.5	The similarities between Wallas' (1926) model creative process and Lindstrom's (2006) creative process criteria	84
Table 2.6	The relationship among the seven elements of digital storytelling, Wallas' (1926) model creative process and Lindstrom's (2006) creative process	85
Table 2.7	The relationship among the seven elements of digital storytelling, the cognitive, metacognitive and affective elements in reading , and creative process	90
Table 3.1	The research procedures	147
Table 3.2	The summary of the class activities, classroom observations and investigations of reading responses and creative processes	149
Table 3.3	The research matrix	155
Table 4.1	The summary of the above-average and below-average readers' reading responses in relation to cognitive elements	167
Table 4.2	The summary of the above-average and below-average readers' reading responses in relation to metacognitive elements	177
Table 4.3	The summary of the above-average and below-average readers' reading responses in relation to affective elements	184

Table 4.4	The summary of the above-average and below-average readers' levels of reading responses and examiners' comments	190
Table 4.5	The summary of the above-average and below-average readers' creative processes in relation to preparation or investigative work	196
Table 4.6	The summary of the above-average and below-average readers' creative processes in relation to incubation or investigative work	203
Table 4.7	The summary of the above-average and below-average readers' creative processes in relation to illumination or inventiveness and the ability to use models	205
Table 4.8	The summary of the above-average and below-average readers' creative processes in relation to verification or capacity for self-assessment	208
Table 4.9	The summary of the above-average and below-average readers' levels of creative processes	214

## LIST OF FIGURES

		<b>Page</b>
Figure 1.1	The schematic diagram of key aspects in the study	32
Figure 2.1	The theoretical framework of the study	97
Figure 2.2	The schematic diagram of key literature review in the study	99
Figure 3.1	The flowchart of the research methodology	160
Figure 4.1	The schematic diagram of the first research question findings	189
Figure 4.2	The schematic diagram of the second research question findings	195
Figure 4.3	The schematic diagram of the third research question findings	211
Figure 4.4	The schematic diagram of the fourth research question findings	223
Figure 5.1	The schematic diagram of some key aspects in discussion and conclusion	260

## LIST OF ABBREVIATIONS

WRL	Wajihah's reading log worksheet
WDSE	Wajihah's digital storytelling elements worksheet
WS	Wajihah's storyboard
WSJ	Wajihah's student journal
WDS	Wajihah's digital story
WIT	Wajihah's interview transcript
FRL	Fayyad's reading log worksheet
FDSE	Fayyad's digital storytelling elements worksheet
FS	Fayyad's storyboard
FSJ	Fayyad's student journal
FDS	Fayyad's digital story
FIT	Fayyad's interview transcript
SRL	Siraj's reading log worksheet
SDSE	Siraj's digital storytelling elements worksheet
SS	Siraj's storyboard
SSJ	Siraj's student journal
SDS	Siraj's digital story
SIT	Siraj's interview transcript
MRL	Mazli's reading log worksheet
MDSE	Mazli's digital storytelling elements worksheet
MS	Mazli's storyboard
MSJ	Mazli's student journal
MDS	Mazli's digital story
MIT	Mazli's interview transcript

CO	Classroom observations
DSGR1	Examiner 1 for Digital Story Grading Rubric
DSGR2	Examiner 2 for Digital Story Grading Rubric
DSGR3	Examiner 3 for Digital Story Grading Rubric
DSGR4	Examiner 4 for Digital Story Grading Rubric
DSGR5	Examiner 5 for Digital Story Grading Rubric



## LIST OF APPENDICES

	<b>Page</b>	
Appendix A	Permission from the University Rector	281
Appendix B	The Consent Form	282
Appendix C	The Reading Placement Test	283
Appendix D (a, b and c)	The Expert Validation Form for the Reading Placement Test	291
Appendix E	The Expository Reading Texts	294
Appendix F (a, b and c)	The Expert Validation Form for the Expository Reading Texts	298
Appendix G	Personal Communication	301
Appendix H	Reading Log Worksheet	302
Appendix I (a and b)	The Expert Validation Form for the Reading Log Worksheet	309
Appendix J	Digital Storytelling Elements Worksheet	314
Appendix K	Personal Communication	318
Appendix L	Personal Communication	319
Appendix M	Digital Story Grading Rubric	320
Appendix N (a and b)	The Expert Validation Form for the Digital Story Grading Rubric	323
Appendix O	Personal Communication	327
Appendix P	Creative Process Grading Rubric	328
Appendix Q	The Expert Validation Form for the Creative Process Grading Rubric	329
Appendix R	Classroom Observational Instrument	330
Appendix S (a, b, c and d)	The Expert Validation Form for the Classroom Observation Instrument	334
Appendix T (a, b, c and d)	The Expert Validation Form for the Interview Instrument	347

Appendix U	Interview Instrument	360
Appendix V	Interview Transcript	364
Appendix W	Storyboard	374
Appendix X	A Respondent's Journal Entry	376

**MEMAHAMI RESPONS PEMBACAAN DAN PROSES KREATIF MELALUI  
*DIGITAL STORYTELLING* DALAM KALANGAN PEMBACA PELBAGAI  
PENCAPAIAN DI SEBUAH UNIVERSITI**

**ABSTRAK**

Dewasa ini, pasaran global memerlukan tenaga kerja profesional yang mahir berbahasa Inggeris dan kreatif. Walau bagaimanapun, didapati bahawa pelajar-pelajar jurusan kejuruteraan di sebuah universiti di mana kajian ini dilakukan mempunyai pencapaian terendah di dalam Bahasa Inggeris. Keputusan ini memberi petunjuk bahawa kebanyakan daripada mereka mungkin tidak menggunakan elemen-elemen kognitif, metakognitif dan afektif dengan baik di dalam pembacaan. Firma-firma perusahaan turut memberi maklumbalas bahawa graduan-graduan kelulusan kejuruteraan kurang kreatif. Justeru, pelajar-pelajar kejuruteraan harus didedahkan kepada suatu mekanisme yang membolehkan mereka meningkatkan kefahaman pembacaan serta kreativiti seperti *digital storytelling* yang telah terbukti keberkesanannya di dalam meningkatkan mutu kefahaman serta kreativiti para pelajar sepertimana yang dicadangkan oleh pengkaji-pengkaji sebelum ini. Walau bagaimanapun, kajian lepas tidak membincangkan secara mendalam akan respon pembacaan yang terhasil di dalam percubaan pelajar memahami sesuatu pembacaan. Kajian yang lepas juga tidak mengupas dengan mendalam tentang proses kreatif pelajar yang terhasil semasa pembinaan *digital storytelling*. Memahami proses kreatif adalah perlu kerana kreativiti terhasil melalui proses tersebut. Maka, penyelidikan ini bertujuan memahami respon pembacaan dan proses kreatif melalui *digital storytelling* dalam kalangan pembaca pelbagai pencapaian. Pelajar-pelajar yang terpilih menjadi responden adalah pelajar-pelajar diploma kejuruteraan di

sebuah universiti. Teori respon pembaca oleh Rosenblatt (1978), model proses kreatif oleh Wallas (1926), kriteria proses kreatif oleh Lindstrom (2006) dan elemen-elemen yang terkandung di dalam *digital storytelling* yang diketengahkan oleh Lambert (2003) diolah menjadi kerangka teori kajian. Memandangkan maklumat yang diperlukan adalah terperinci, rekabentuk penyelidikan ialah kajian kes bercorak kualitatif. Persampelan bertujuan yang mengandungi dua orang pelajar yang mempunyai pencapaian aras tertinggi serta dua orang pelajar yang mempunyai pencapaian aras terendah di dalam pembacaan telah dipilih menerusi sebuah ujian penempatan pembacaan. Jangkamasa yang diberi kepada responden untuk menyiapkan projek *digital storytelling* mereka ialah selama tiga minggu. Sumber-sumber data diperolehi menerusi pemerhatian dalam kelas, dokumen-dokumen responden, transkrip temu bual dan *digital storytelling* yang dihasilkan. Penemuan menunjukkan bahawa menerusi *digital storytelling*, seseorang responden yang telah menggunakan elemen-elemen kognitif, metakognitif dan afektif boleh mencapai kefahaman yang baik walaupun berpencapaian aras terendah di dalam pembacaan. Penemuan juga menunjukkan bahawa menerusi *digital storytelling*, proses kreatif lebih banyak dipraktikkan oleh responden yang mempunyai minat mendalam, berdaya tahan dan berdisiplin, dan proses kreatif tidak dipengaruhi oleh kebolehan kognitif seseorang semata-mata. Oleh kerana pelajar-pelajar berupaya membina respon pembacaan serta berkreativiti dengan baik menerusi *digital storytelling*, adalah diharapkan bahawa *digital storytelling* akan mendapat perhatian sewajarnya di dalam sistem pendidikan di Malaysia.

**UNDERSTANDING THE READING RESPONSES AND CREATIVE  
PROCESSES THROUGH DIGITAL STORYTELLING AMONG READERS  
WITH DIFFERENT READING ACHIEVEMENTS IN A UNIVERSITY**

**ABSTRACT**

The 21st century global market demands highly skilled workforce who are articulate in English and creative. However, in a university where this study was administered, the participating engineering students were found to be the least proficient students in English. Their poor results may give an indication that the majority of them may have not employed the cognitive, metacognitive and affective elements in reading well. Malaysian employers have also complained that engineering graduates lack creativity skills. Therefore, engineering students need to be exposed to a learning means that can help foster both their reading comprehension and creativity. As such, a rational action would be requesting them to develop digital storytelling since literature has claimed it to be influential in enhancing students' reading comprehension and creativity. However, what previous studies have not discussed are the different responses readers of different reading abilities have produced in their digital stories in achieving good comprehension. The previous studies have also not discussed the creative processes that students may exhibit while they are developing their digital stories. Understanding students' creative processes is necessary as creativity is the byproduct of these processes. Thus, this study sought to understand the reading responses and creative processes through digital storytelling among the above-average and below-average readers of diploma in engineering students in a university. Rosenblatt's (1978) reader-response theory, Wallas' (1926) creative process model, Lindstrom's (2006) creative process criteria and Lambert's (2003) digital storytelling elements were used as the theoretical framework for this study. The detailed nature of the information required in this

study indicated the need to apply a qualitative case study research design. A purposive sample of two above-average and two below-average readers was selected based on their reading performance in an English reading placement test. The duration for the digital storytelling project was three weeks. Data sources included class observations, respondents' documents, interview transcripts and digital stories. Findings indicated that by developing digital stories, above-average and below-average readers alike who had utilized a repertoire of cognitive, metacognitive and affective reading elements could achieve meaningful understanding. Findings also indicated that creative processes were exercised more by highly interested, resilient and disciplined respondents, and were not necessarily influenced by one's cognitive abilities alone. Now that it is understood that multiple reading responses and good creative processes can be exercised through digital storytelling regardless of one's reading achievement, it is hoped that digital storytelling will have its place in the Malaysian educational system.

## CHAPTER ONE

### INTRODUCTION

#### 1.0 Introduction

The 21st century global market demands highly skilled workforce who are articulate in English and creative (Faizah Abd Majid, 2010; Kalaimagal Ramakrishnan & Norizan Mohd Yasin, 2012; Spence & Liu, 2013). The ‘Kementerian Pengajian Tinggi’ or Malaysian Ministry of Higher Education (2011) acknowledges these challenges and has thus outlined in its national strategic plan for the years of 2011 to 2015 that its focus areas lie, among others, in the advancement of academic excellence and creativity.

Having academic excellence and being articulate also depends profoundly on reading comprehension, especially of the expository texts (Guthrie, Wigfield, & Klauda, 2012). Nevertheless, what is worrying is that at the university level, there are students who face difficulty in understanding, extracting and organizing main ideas, drawing inferences and applying the information read from their assigned expository texts (De Simone, 2007). Naughton (2008) stated that the main objective of reading is comprehension but not all university students know how to process or organize information effectively as many have never undergone a formal training on information organization (Cornford, 2002). Although university students should be able to make inferences or perform in-depth text analysis while reading (Yahya Othman, 2008), there are still many who have not been able to do so. This is especially true among below-average readers who have difficulty in making inferences, identifying main ideas and themes from reading texts (Long,

Oppy & Seely, 1997; Nation & Angell, 2006) as compared to above-average readers who can comprehend implicit and inferred information, author's point of view and tone, persuasive arguments, as well as appreciate the richness of written language (American Council on the Teaching of Foreign Languages, 2012).

In an English reading test done with a group of thirty-five diploma engineering students in a university, it was found that below-average readers had difficulties in literal comprehension, inferential comprehension and evaluation comprehension (Rofiza Aboo Bakar, Hairul Nizam Ismail & Aswati Hamzah, 2012). This confirms Cain's (2009) report that below-average readers do not monitor their comprehension consistently, are less likely to make inferences as a result of knowledge deficits in general knowledge, and are less likely to know about the text structure of a reading text. In contrast, the above-average readers are more likely to make inference, monitor comprehension and know text structure (Cain, 2009). Thus, researchers' attention to understand and assess the reading comprehension among below-average and above-average readers is called upon. One of the aims of this research is to react to the call by investigating readers' responses. Readers' responses are reactions to the reading activity that readers make to comprehend a reading text (Rosenblatt, 2006). Cain (2009) admitted that to understand how a reader comprehends can pose a great challenge; however, he offered an assurance that the benefits to the readers, be them below-average or above-average, will be far greater.

Reading comprehension is an active, difficult and complex thinking process (Cain, 2009; Mc Whorter, 2010) which involves the reader and the



text (Nuttall, 2000; Rosenblatt, 1978; Singhal, 1998). If university students' enhancement in reading comprehension is wished for, they should be helped in reading aspects involving the cognitive, metacognitive and affective (Caldwell, 2002). Some examples of the cognitive elements in reading are visualizing and summarizing main information in diagrams (Shameem Rafik-Galea, 2002) and summarizing main information by pairing simple images with minimal use of words (Rofiza Aboo Bakar, Hairul Nizam Ismail & Aswati Hamzah, 2010). The examples of metacognitive elements in reading can be activating background knowledge (Iwai, 2011) and identifying the purpose for reading (Cromley, 2005; Oxford, 1990; Pressley, 2002). The affective elements in reading can be using music to evoke emotional aspects (Oxford, 1990).

Besides facing difficulty in reading comprehension, some university students are also feared to be lacking in creativity and imagination (Chen & Chen, 2012; "Test Takers Kill Creativity," 2011) for being too concerned with getting their answers correct in examinations that they fall into the trap of memorizing and regurgitating (Crème, 2003; Lee, 2006). Cropley (2010) explained that for many students, creativity is regarded with suspicion or described as a bad thing for it brings uncertainty for them. However, thinking creatively is an important trait which university students should possess in order to learn to collaborate, interact, be team players and contribute original ideas and thoughts (Livingston, 2010) besides being flexible, open and tolerant of uncertainty in a fast changing world (Galbraith & Jones, 2003). To some university students, especially engineering students, creativity is an essential trait for innovation and applications

(Costantino, Kellam, Cramond, & Crowder, 2010). They reported that most developed countries are now moving from an industrial economy towards a knowledge economy which calls for creativity in those who wish to successfully compete in a global economy. They stressed the importance for educators to prepare engineering students to not only be analytical and technically capable, but also be creative thinkers as creativity is vital to design and engineering. Creativity is an important 21<sup>st</sup> century skill. In fact, the 21st century has been named 'The Creative Economy Era' that stresses on creative industries, such as advertisements, architecture, software, research and design and video games which all provide 7.3 percent of the world economy (Hawkins, 2002 as cited in Mohd Azhar Abd Hamid, 2004).

Thus, it is argued here that educators need to expose university students to the learning means that can help them in both their reading comprehension and creativity. In such a case, a rational action would be asking them to create digital storytelling. The literature reviewed showed that digital storytelling is described as an art of telling stories with the incorporation of the use of multimedia tools, such as graphics, images, photographs, audio, video and animation to tell a concept in learning materials (Dupain & Maguire, 2007; Robin, 2008a; Sandars, Murray & Pellow, 2008). Robin (2008a) believed that students who create digital stories can improve their literacy skills. Mullen and Wedwick (2008), Siti Nor Amyah (2011) and Stuart (2010) experimented digital storytelling with their students in language arts classes and it was found to enable students to increase their vocabulary schemata to enjoy poetry. Digital storytelling has been portrayed as having the potential to help university students be better off

in their reading activity (Dupain & Maguire, 2007) and creativity (Robin, 2008a). Robin (2008a), however, advocated that further studies be done on testing the effectiveness of digital storytelling.

Although related studies on digital storytelling (Di Blas, Garzotto, Paolini & Sabiescu, 2009; Dupain & Maguire, 2007; Genereux & Thompson, 2008; Jenkins & Lonsdale, 2007; Robin, 2008a; Stuart, 2010) have highlighted its benefits in promoting reading comprehension and creativity, they have only briefly mentioned these aspects without elaborating on how students could achieve them. In light of the aforementioned statement, the aim of this study is to understand critical criteria in reading responses and creative processes that could emerge through digital stories that are produced by the above-average and below-average readers. This is in line with Rosenblatt's (2006) request that researchers study the different readers' responses and their relationships with the cognitive, metacognitive and affective elements. In addition, this will add to the knowledge of affective elements in expository texts since more of the discussion is found in narrative texts (Altmann, Bohrn, Lubrich, Menninghaus & Jacobs, 2012). It is also beneficial to highlight here that creativity can be defined as a process because it is an important causal agent for all expressions of creativity (Runco, 2010). Because the nature of the information in this study was very detailed, therefore it needed to apply qualitative research methods. The aim of the study, thus, was to qualitatively understand the reading responses and creative processes through digital storytelling among the above-average and below-average readers in a university. These aspects were worth explored

and understood so that digital storytelling could be suitably applied in the university classroom later.

## **1.1 Background of the Study**

Keizrul Abdullah, the Head of Malaysian Institution of Engineers, claimed that the country has one of the smallest engineering population in the South East Asian region (Chai, 2008). He revealed that in 2008, while Singapore, a relatively smaller country than Malaysia, had about 100,000 engineers, we only had about 60,000 engineers. The Malaysian Prime Minister, Datuk Seri Najib Tun Abdul Razak also admitted that the country has only achieved 18% of the Ninth Malaysia Plan which targets to have sixty engineers, scientists and researchers for every 10,000 people in the workforce, thus driving the government to do what is necessary to deal with this shortage (“Government Will Do Utmost To Address Shortage of Science Talent,” 2009). According to the ‘Unit Perancang Ekonomi’ or the Economy Planning Unit, Malaysia (2010), we need more of these professionals as they are the nation builders and one of the biggest contributors to the Malaysian economy.

Thus, making the engineering education as the biggest sector in our tertiary education could be a means to overcome the shortage of engineers (Ministry of Higher Education, 2006). In a Universiti Teknologi MARA (UiTM) campus, whereby this study is being carried out, the engineering students makes up 78% of the total student population in the diploma courses in the university; other fields offered are Hotel and Management, Health Sciences and Pharmacy, with each taken up only 13%, 5%, 4% of the total

population, respectively (Raptah Ayob, personal communication, April 11, 2011). The engineering diploma curriculum in UiTM has in fact been revised to realign with the vision of the national tertiary educational philosophy (Yoot, Wahidah Mansor, Md Mahfudz Md Zan, Yusof Md Salleh, Norashimah Khadri, Badrul Hisham Mat Tahir, Kartini Salam, & Wan Noraini Wan Abdullah, 2008) that engineers or assistant engineers produced should be resilient, competitive, innovative, cultured, intellectually rigorous and creative (Ministry of Higher Education, 2006) to prepare them to compete globally when they enter the labour force soon after they have graduated.

Since English has been established as the global language of international business, working professionals need to be competent in all skills such as writing, oral communication, listening comprehension and reading comprehension (Spence & Liu, 2013). In their study, it was reported that engineers working in factories have to read professional texts, office documents, project documents, manuals and written instructions, and reading is a skill that engineers use most commonly. However, engineering students in a university were found to be among the ones with the least sufficient vocabulary knowledge (Nor Azni Abdullah, 2012), which is feared to be affecting students' overall reading comprehension and performance in the content subject areas (Cain, 2009; Tan, Ong, Lim & Foo, 2008; Wiltgen, 2011). In addition, engineering students were discovered as the least proficient students in English in a university (Akademi Pengajian Bahasa, UiTM Cawangan Pulau Pinang, 2012) which renders a study about their understanding or responses in reading to be carried out. This problem cannot

be taken for granted since being excellent in academic depends inevitably on understanding expository reading texts (Guthrie, Wigfield, & Klauda, 2012).

Lecturers who are involved in teaching engineering students can benefit from a review of studies done by Felder and Brent (2005) and Felder and Silverman (1988) on engineering students that stated that the majority of them prefer active, sensing, visual and sequential types of learning. Most engineering students are known to be learners who are active (prefer to process information through engagement in physical activity), sensing (prefer sights, sounds and physical sensations), visual (prefer pictures, diagrams and flowcharts) and sequential (progress through logical and incremental steps). This knowledge should motivate lecturers to consider the role played by various multimedia applications, such as digital storytelling to be a teaching and learning strategy. Digital storytelling is a computer-mediated activity-based learning which involves a lot of graphic, still pictures, music and animation (Dupain & Maguire, 2007; Gordon, 2011; Robin, 2008a; Sandars, Murray & Pellow, 2008). It attends to sensory and visual learning because students working on it may use sound, music and pictures (Kajder, 2006). It also attends to sequential learning because students may need to use a storyboard to draft the organization of a digital story to achieve accuracy (Dupain & Maguire, 2007).

Dupain and Maguire (2007) stressed that by doing a digital storytelling project, students could increase their comprehension of a particular topic. Robin (2008b) stated that digital storytelling in an educational setting can allow students to enhance their information-gathering

and creative problem-solving skills. Thus, digital storytelling is assumed to be a means that could foster students' reading comprehension.

Earlier it was mentioned that engineering students need to be creative to prepare them for the global competition. Digital storytelling in that light is not only claimed to enhance students' reading comprehension, but it is also argued to improve students' ability to think creatively while constructing and interpreting reading texts through the use of media. Gurian, Stevens and King (2008) asserted that by doing such project and presenting it, students have the "opportunity to summarize, synthesize, and incorporate higher-level thinking skills in a format that is generally far more appealing than the standard paper-and-pencil book report or journal entry" (pg. 120). Livingston (2010) and Walsh (2007) suggested that to increase creativity, students need to be allowed to explore, learn and exercise technological asset in this era of information technology and to be given the opportunities to contribute their original thoughts besides being inventive. This can be likened to suggesting that students perform the digital storytelling project in the English Language class since both reading comprehension and creativity may be exercised and developed while developing digital stories.

The impetus for this study is derived from the desire to explore digital storytelling which is still in its infancy stage in the educational setting (Thesen & Kara-Soteriou, 2011) and requires more research being done to know more about it although it has been claimed by some researchers to be promoting advantages. Thus, understanding the potential that digital storytelling may bring about in both reading responses and creativity is the guidepost for this study.

## **1.2 Statement of the Problem**

Merriam (1988) explained that a research problem may include a range of factors extending from uncertainty, doubt or difficulty. In this research, the issues of the difficulties engineering students face in the areas of reading, the problem with accepting only one correct answer to reading texts, the lack of creativity skills among engineering students, and the uncertainty about the creative processes are discussed.

### **1.2.1 The Reading Difficulties in Expository Texts among Engineering Students**

Guthrie, Wigfield and Klauda (2012) have made a profound statement that academic excellence lies in understanding expository texts. In fact, the university-level reading is mainly made up of expository texts (De Simone, 2007). At Universiti Teknologi MARA (UiTM), the main concern is to enable students to understand expository texts by identifying main and supporting ideas, predicting, skimming, making generalization, making inferences and reading critically (Akademi Pengajian Bahasa, 2008b). Thus, the English for Academic Purposes course is introduced to prepare students to employ the language skills and strategies necessary to carry out their academic tasks (Akademi Pengajian Bahasa, 2008b) because more than 95% of the references and texts in the Malaysian university are in English (Faizah A Majid, 2007).

However, one of the fundamental concerns for language academics in UiTM is that, despite being trained and having had many hours of reading classes, many students are still incompetent in reading academic texts in English. In a study conducted by Nor Azni Abdullah (2012), the engineering



students were found among other students to be the ones with the least sufficient vocabulary knowledge to comprehend English reading materials. Vocabulary or knowing word meanings is an important evidence as to how much students have already read and learned (Gillet, Temple, & Crawford, 2008). Vocabulary is significant in understanding academic reading texts and not having sufficient vocabulary knowledge can affect students' overall comprehension and performance in the content subject areas (Cain, 2009; Tan, Ong, Lim & Foo, 2008; Wiltgen, 2011).

In the English for Academic Purposes 2012 report released by the Academy of Language Studies in the UiTM where this study is being carried out, the engineering faculty came last after the Pharmacy, Health Sciences and Hotel and Management faculties in terms of the A, B, C and F grades. The Pharmacy faculty was on top of the list with 70% of their students scoring the A grades and 30% B grades. The Health Sciences faculty had 29% of their students scoring the A grades and 72% B grades. The Hotel and Management faculty marked the third place with 25% of their students getting the A grades, 59% B grades, 6% C grades and 9% failures. Unluckily, only 14% of the Engineering students managed to get the A grades. The majority of them or 64% belonged to the B grades. The other 15% of the students were in the C grades category and 7% failed the paper. Thus, it could be assumed that the engineering students in the UiTM were the least proficient students in English in the university which leads to this research that proposes to study about their reading responses more closely.

The questions in the reading component generally tested the students' ability in identifying main ideas, making inferences and interpretations, and

drawing conclusions. Thus, the students' poor results may give an indication that the majority of these engineering students may have not exercised the cognitive and metacognitive elements in reading, such as extracting important details, activating background knowledge, questioning to construct meaning, making conclusions and summarizing. These elements are utilized by most above-average readers in their learning (Herman & Wardrip, 2012) and to improve expository text comprehension (Dymock & Nicholson, 2010). According to Norris and Phillips (2003) and Pavelich and Moore (1996), these cognitive and metacognitive elements are essential to science domain literacy to help engineering students survive through the later years of their engineering study and to recognize more sophisticated and relativism in knowledge, appreciate the social and political impact of science, as well as recognize multiple interpretations.

Students' reading comprehension can be improved, and there has been an extensive literature on digital storytelling, an art of organizing ideas or telling stories with the incorporation of the use of multimedia tools (Robin, 2008a, Sandars, Murray, & Pellow, 2008), which claims its effectiveness in enhancing the reading comprehension of students of various ages (Di Blas, Garzotto, Paolini & Sabiescu, 2009; Karan-Miyar, 2009; Malin, 2010; Rance-Roney, 2010; Siti Nor Amyah Khasbullah, 2011). However, to date, a particular dimension that has not been investigated is the different responses readers of different reading abilities have made to the same reading texts and their portrayal of these responses in their digital stories in achieving good comprehension. This should be investigated since Rosenblatt (2006) claimed that the same reading texts yield different meanings to different readers, and

that readers' responses and understanding are always influenced by their selective attitude or purpose in reading. Rosenblatt (2006) has called researchers' attention by stressing that there is a need for study of different readers' responses and their relationships with the cognitive, metacognitive and affective elements. Thus, this leads to the first objective of the research which is to investigate the reading responses that above-average and below-average readers of diploma engineering students make and their portrayal of these responses in their digital stories. This is also in line with Pang's (2008) suggestion that reading research focus on the types of readers, such as above-average and below-average readers, and their reading responses that include affective elements, which we have limited knowledge about in expository texts because more of the discussion is found in narrative texts (Altmann, Bohrn, Lubrich, Menninghaus, & Jacobs, 2012).

Rosenblatt (2006) also pointed out that in reality, the testing of reading in the education system has been based on one, absolute, correct meaning attributable to the reading texts although these texts may produce a continuum of meanings or different meanings to different readers, and that contemporary theorists are generally accepting that there cannot be just one truthful answer to the reading texts. Given that readers may generate new and alternative justifications about the reading texts, an appropriate rubric should be used to assess readers' possible and sound responses in their digital stories. Since there has been a scarcity in a standardized rubric to assess readers' digital stories (Di Blas, Garzotto, Paolini & Sabiescu, 2009; Genreux & Thompson (2008); Jenkins & Lonsdale, 2007; Karan-Miyar, 2009; Malin, 2010; Rance-Roney, 2010; Siti Nor Amyah Khasbullah, 2011),

a rubric originated from Dupain and Maguire (2007), has been modified to assess readers' alternative and possible responses. This rubric has been validated by two reading experts for its usage suitability. This leads to another objective of the research which will assess the continuum or the levels of the reading responses among the above-average and below-average readers using the digital storytelling rubric.

### **1.2.2 The Lack of Creativity Skills among Engineering Students**

Recently, employers of engineers in Malaysia have pointed out that among the reasons they are not fully satisfied with the engineering graduates are that they lack creativity skills (Norlida Buniyamin, Nur Syahira Rahmat, Zainuddin Mohamad, 2010). This is a cause for concern because creativity is an important trait for innovation and applications for engineers (Constantino, Kellam, Cramond & Crowder, 2010). However, one reason for not being creative could stem from the fact that these graduates came from an exam-oriented schooling system (Hussain Othman, Berhannuddin M. Salleh, Abdullah Sulaiman, & Ahmad Esa, 2009) that has produced students who are too concerned with the 'getting-it-right' attitude and has thus stifled their development of creativity (Crème, 2003). Lovitts (2005) termed them as students who learn not for the sake of being independent thinkers, but merely good course takers and good test takers.

Kazerounian and Foley (2007) claimed that part of the fault lies with the engineering faculty in the universities. They reported that when engineering students produced creative work and presented it to the faculty, their work was often viewed as sloppy and of lower standards. The faculty

believed that engineering is a serious business that demands absolute accuracy, and thus flexibility and ambiguity, which are examples of creative traits, are not welcome. They added that no one had taught the engineering students that making mistakes could offer insights into successful discovery. Students fear mistakes, and this leaves no room for new frontiers to be explored. What educators keep on pounding is that students must use established procedures to design.

Nevertheless, with the globalization of industry, the Malaysian university academics in any discipline, especially the ones in the engineering education, has been pressured by the Malaysian Ministry of Higher Education to provide a system that fosters and enhances creativity in engineering students for them to be able to adapt to the global marketplace (Norhayati M. Nor, Noraini Rajab, & Kamsiah Ismail, 2008). Unfortunately, it is not clear how creativity can be nurtured within engineering students (Baillie, 2002) and little has been done in many universities to place emphasis on the means to develop creativity in their engineering students (Liu & Schwonwetter, 2004). In fact, in the report written by Norhayati M. Nor, Noraini Rajab and Kamsiah Ismail (2008), although creativity is a trait claimed to be important and desired among engineering graduates for the year 2020, only little has been written on how engineering students can actually acquire creativity.

To foster creativity, O'Brien (2001) proposed that educators include a multimedia project such as digital storytelling. A review of literature on digital storytelling shows that digital storytelling can allow students to showcase their creativity (Di Blas, Garzotto, Paolini & Sabiescu, 2009; Dupain & Maguire, 2005; Genereux & Thompson, 2008; Jenkins &

Lonsdale, 2007; Robin, 2008a; Stuart, 2010). Nevertheless, what has not been researched so far is the creative processes that students may undergo before they can showcase their creativity in their digital stories. Understanding the students' creative processes is necessary as this may allow educators to effectively train students to demonstrate creative thinking later.

Therefore, the third aim of this study is to understand the creative processes that readers with different reading achievements among diploma of engineering students may experience while developing their digital stories. This study can add to the scanty studies related to creativity among engineering students (Badaruddin Ibrahim, 2012) besides answering Elmerr's (2006), Giloi's (2011) and Richards' (2010) call that more research be carried out to explore the creative processes as creativity is the byproduct of creative processes.

So far, this study itself has reiterated how digital storytelling has been recommended by Di Blas, Garzotto, Paolini and Sabiescu (2009), Dupain and Maguire (2007), Genereux and Thompson (2008), and Jenkins and Lonsdale (2007) as a means to foster students' creativity. However, there is no elaboration made by the researchers as to how students' creative processes nor creative process levels can be assessed while developing digital stories. Simonton (2012) reported that there are various ways of assessing creative processes but these varied means do not have to agree with each other as creative processes is a very complex phenomenon. Thus, Lindstrom's (2006) idea on creative processes is worth being explored in this study especially when the criteria of creative processes are clearly defined and levels are given to indicate competence: whether one is a novice or expert in the creative

processes (Ellmers, 2006; Giloi, 2011). This study aims to understand whether by doing digital stories above-average readers will always be experts in the creative processes, and whether below-average readers will still be novices in the creative processes. In Kaufman's (2009) review of studies on cognition and creativity, he reported that people with high cognitive abilities were strongly linked to producing more creative products. In Tatum's (2009) study, above-average readers are found to use more cognitive abilities like using more prior knowledge, making questions and writing summaries than the below-average readers. In other words, will above-average readers exhibit better creative processes than the below-average readers since the latter are considered using less cognitive and metacognitive abilities (Tsai, 2012)? Thus, the fourth main objective of this study is to investigate the levels of the creative processes among above-average and below-average readers while developing their digital stories using Lindstrom's (2006) creative process grading rubric.

In summation, this study seeks to understand the reading responses and creative processes through digital storytelling among the above-average and below-average readers of diploma in engineering students in a university. There is a need for research to explore what possible reading responses and justifications different students may offer in portraying their understanding of reading texts in the form of digital stories, since one absolute truth attributable to reading texts are no longer sufficient these days. Furthermore, this study could also lead to discovering students' creative processes so that they can be better appreciated when they toil over their work for a completion of a project. It may also cast some light as to whether digital storytelling is

helpful to and worth being done by students, especially the below-average readers. Digital storytelling, in short, needs exploration before it can be utilized in classrooms.

### **1.3 Objectives of the Study**

This study is developed under four research objectives:

1. To investigate the reading responses in relation to cognitive, metacognitive and affective elements that the above-average and below-average readers portray in their digital stories.
2. To assess the levels of the reading responses among the above-average and below-average readers using the digital story grading rubric.
3. To explore the creative processes exhibited by the above-average and below-average readers while developing digital stories.
4. To identify the levels of creative processes among the above-average and below-average readers using the creative process grading rubric.

### **1.4 Research Questions**

This study sought to answer the following questions:

1. How have the above-average and below-average readers' reading responses in relation to cognitive, metacognitive and affective elements been portrayed in their digital stories?
2. What is the level of the reading responses of each of the above-average and below-average readers?



3. What are the creative processes that are exhibited by the above-average and below-average readers while developing their digital stories?
4. What is the level of the creative processes of each of the above-average and below-average readers?

## **1.5 Rationale of the Study**

There are a few reasons on which this study is based on. First, it is to understand the reading responses in relation to the cognitive, metacognitive and affective elements that the above-average and below-average readers generate as the same reading texts may produce different meanings to these readers. This is in line with Rosenblatt's (2006) and Pang's (2008) suggestions that future research ought to concentrate on different types of readers (that is, the above-average and below-average readers in this study) and their different responses, as well as the influences of cognitive, metacognitive and affective elements on the responses. In addition, this study may cast some light on the understanding of affective elements in expository texts since previous discussion has predominantly centred on narrative texts (Altmann, Bohrn, Lubrich, Menninghaus & Jacobs, 2012).

Secondly, this study is conducted to understand what acceptable continuum or levels of responses that the above-average and below-average readers produce in regards to the same reading texts. This is in line with Rosenblatt's (2006) explanation that contemporary reading theorists believe that there cannot be just an absolute response to a reading text. Thus, a rubric

by Dupain and Maguire (2007) will be used to assess the above-average and below-average readers' levels of reading responses.

The third principle why this study is being performed is to understand the creative processes exhibited by the above-average and below-average readers while developing digital storytelling. Research on creative processes, as suggested by Richards (2010), should be performed as creative processes are the gateway to creativity – a trait looked for among engineering graduates by employers in order to be skillful players in the global market (Norhayati M. Nor, Noraini Rajab, & Kamsiah Ismail, 2008).

The fourth reason why this study is being carried out is to understand whether digital storytelling can allow students, especially the below-average readers, to increase the levels of their creative processes. Kaufman (2009) has reported that people with high cognitive abilities can produce more creative products than people with low cognitive abilities. For example, it is assumed that above-average readers can produce more creative products than the below-average readers because the former can use more cognitive abilities than the latter. However, digital storytelling requires all types of readers to perform certain creative processes such as analyzing, synthesizing and imagining (Adair, 1990). The study would like to investigate whether by developing digital storytelling, the levels of creative processes, especially among the below-average readers, will remain at the novice level or be upgraded to the master or expert level. Therefore, a creative process grading rubric by Lindstrom (2006) will be employed to assess the creative process level among the above-average and below-average readers in this study.

The students' reading responses and creative processes will be investigated and a conclusion will be made whether digital storytelling is suited to benefit university students, in particular engineering students, in their reading comprehension of expository texts and creativity. It is important to regard this study as an initial exploration whose implications are yet to be formally examined, since digital storytelling is still in its infancy in the educational setting (Thesen & Kara-Soteriou, 2011). Research has indicated that digital storytelling has been used in language arts (Malin, 2010; Siti Nor Amyah, 2011; Stuart, 2010) with secondary and high school students. In these studies, the students were shown the readily available digital stories to help them increase their reading comprehension of literary works, vocabulary and cultural schemata in order to enjoy poetry and literature. However, little is known about expository reading responses of university students who develop their own digital stories, let alone the reading responses and their relationships to the cognitive, metacognitive and affective elements that the above-average and below-average readers portray in their digital stories. Next, although Dupain and Maguire (2007), Jenkins and Lonsdale (2007), and Genereux and Thompson (2008) claimed that university students from health science, landscape design and biology fields respectively can enhance their creativity through digital storytelling, these researchers did not discuss this subject of creativity extensively nor explain the process that students undergo in order to call them creative.

Thus, in this qualitative study, by exploring the responses students make to the expository texts and studying the creative process of developing digital stories, the researcher hopes to provide a rationale for the use of digital

storytelling in the English reading class for Diploma of Engineering students and as a tool to promote creativity.

## **1.6 Significance of the Study**

This study is anticipated to be significant in some aspects. A prime significance of this study is to explore and provide empirical evidence whether digital storytelling can play a role in fostering students' reading comprehension that emerges through their reading responses. Researchers like Kajder (2006), Kajder and Swenson (2004), and Malin (2010) had reported that through the use of digital stories, reading comprehension and concepts of subject matter were constructed, and that students displayed confidence and positive attitudes towards the reading texts given. In addition, since digital storytelling emphasizes on the use of language, images and sound which can provide necessary presentation skills which can be learnt by students, the findings of this study would be useful in creating a model of instruction in the use of digital storytelling in a classroom. The Malaysian Ministry of Higher Education (2011) has introduced guidelines for schools and universities to instill literacy in information and communication technology (ICT) to better prepare the workforce to meet the challenges in the 21<sup>st</sup> century workplace. Therefore, it is imperative that digital storytelling is included in the present study.

Another importance of this study is that the dearth of a research on a creative process that can be transformative for below-average readers, especially, in the English language class. There have been several journalistic articles over the years about the values of digital storytelling on

students' creativity growth (Di Blas, Garzotto, Paolini, & Sabiescu, 2009; Dupain & Maguire, 2007; Genereux & Thompson, 2008; Jenkins & Lonsdale, 2007). However, despite the existence of these studies, there has been little research into the creative processes and on the implications that individual student experiences in undergoing them while developing a digital story. The subject on creativity in these studies has also been mentioned very briefly. Therefore, it is vital that the subject of creative processes is included in the present study. The results of this study can be added to the growing body of research, literature reviews and empirical data attempting to understand the effects of nurturing digital storytelling on students' creative processes. Digital storytelling may promote and multiply the ways students respond to reading and exercise creative processes. By knowing this, UiTM policy makers may want to consider employing digital storytelling in language classes or other subjects on the curriculum at UiTM.

This study has outlined a thorough methodology in studying students' reading responses and creative processes. The Windows Movie Maker training that was given to students, the duration of time that students were given to complete their digital storytelling projects, the classroom observation instrument, related documents and interview instrument had all been consulted about and validated by experts in their respective fields such as digital storytelling, reading, creativity and qualitative research. So, one of the contributions of this study lies in its thorough methodology, and future studies may want to replicate it to learn more about students' comprehension of content subjects and their creative processes through digital storytelling that may all add to the reinforcement of the methodology.

## **1.7 Limitations of the Study**

Although this research was carefully planned, there existed some limitations and shortcomings. The first was the length of the study. Because of the time limit, the data from the research was only collected during one single semester; consequently, the limited length of this study may only produce short-term, not long-term effects. Secondly, this research was conducted only on one class consisted of students from a type of an engineering course enrolling in their third semester attending the English language class at one of the UiTM campuses. Therefore, to generalize the results for all types of engineering courses, the study should have involved more participants from different types of engineering courses. Thirdly, the limitation for this study was the method utilized for the data collection. The respondents' responses to the semi-structured interviews might be another limitation due to the possibility that participants may have responded to the questions with 'teacher pleasing' answers. Finally, respondents' efforts and creative processes shown in developing digital stories may also be some limitations to this study, as this act of developing digital stories was imposed on them by the researcher.

## **1.8 Definitions of Terms**

The following are the conceptual and operational definitions of several important terms included in this study.