

**ASEAN 4 KIDS: AN INTERACTIVE APPLICATION FOR
LEARNING ASEAN CULTURE**

By

Aris Chema

Dissertation submitted in partial fulfilment of
the requirements for the
Bachelor of Technology (Hons)
(Information and Communication Technology)

JANUARY 2013

Universiti Teknologi PETRONAS
Bandar Seri Iskandar,
31750 Tronoh
Perak Darul Ridzuan

CERTIFICATION OF APPROVAL

**ASEAN 4 KIDS: AN INTERACTIVE APPLICATION FOR LEARNING
ASEAN CULTURE**

by

Aris Chema

A project dissertation submitted to the
Information & Communication Technology Programme
Universiti Teknologi PETRONAS
in partial fulfilment of the requirement for the
BACHELOR OF TECHNOLOGY (Hons)
(INFORMATION & COMMUNICATION TECHNOLOGY)

Approved:

(Assoc. Prof. Dr. Dayang Rohaya Bt Awang Rambli)
Project Supervisor

UNIVERSITI TEKNOLOGI PETRONAS
TRONOH, PERAK

January 2013

CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project, that the original work is my own except as specified in the references and acknowledgements, and that the original work contained herein have not been undertaken or done by unspecified sources or persons.

ARIS CHEMA

ABSTRACT

With three years to the implementation of ASEAN Community in 2015, knowledge about ASEAN is the basic fundamental building block to the success of the ASEAN Community. A research has revealed that currently there is still a significant knowledge gap about ASEAN among young generation. Therefore, this project aims to fulfill this gap by designing and developing an interactive application for learning ASEAN culture named “ASEAN 4 KIDS”. Objective of this project are to develop an interactive application that encourages young children especially primary school students to learn some basic knowledge about ASEAN and culture of each member countries. The project also aims to raise awareness and understanding of ASEAN, its people and cultures to the target users through ICT.

Additionally, the objectives are to explore the use of game-based approach in promoting culture learning as well as to evaluate the effectiveness of the application in learning ASEAN culture. Currently in the market, there are limited numbers of culture teaching applications that integrate various aspects of culture. Furthermore, the products that actually focus on teaching ASEAN Culture are very scarce. Using Flash and Augmented Reality, the system exposes the young children to the technology while they learn from the animation lessons and play the interactive games which are the mechanism to teach about ASEAN and deliver the educational content.

Besides, the proposed system, this project also involves the study of how culture is being taught in school and the study of young children nature. As a result, the lessons and games are age-appropriate and match the abilities of the children. As a consequence the system is not only creating a joyful learning for the children but also help create awareness and understanding about ASEAN among them.

The prototype system was tested with 5 primary school children aged between nine to twelve years old under the instruction of the developer and parents. The result of the testing showed the excitement of the children towards the system which is a good sign for the implementation in the real learning environment later on.

ACKNOWLEDGEMENT

First and foremost, all praises to The Almighty for His mercy, graces, blessings and guidance in giving me inspiration to take on this project and giving me strength to get through the challenges in completing this project.

Upon completing this project, I am particularly grateful for the assistance given by all parties who have contributed along the process of completion of this project. Firstly, I would like to express my gratitude to Universiti Teknologi PETRONAS for giving me this precious opportunity to learn new things through accomplishing the final year project.

This gratitude and appreciation also dedicated towards my project supervisor, Associate Professor Dr. Dayang Rohaya Bt Awang Rambli, who had continuously monitored the progress throughout the duration of the project. Her constructive comments and advices, continuous positive support and guidance have led the project towards its successful final outcome.

A Special thanks to my mother, brothers, and sisters for their endless love, support and encouragement. Thanks for all the sacrifices that you've made on my behalf. Your prayer for me was what sustained me thus far.

Last but not least, Thanks to all my fellow friends, seniors (Wannisa Matcha, Yossawadee Kaeomanee) and anybody who has contributed directly or indirectly toward accomplishing this project. Without your support and cooperation this project would not be possible. Thank you very much and May god blesses all of you

TABLE OF CONTENT

CHAPTER 1: INTRODUCTION	1
1.1 Background of Study	1
1.2 Problem Statement	2
1.3 Objectives and Scope of Study	5
1.4 Limitation and Feasibility Studies	6
CHAPTER 2: LITERATURE REVIEW	8
2.1 Culture	8
2.1.1 Definition of Culture	8
2.1.2 How Culture and History being taught in school	9
2.1.3 Culture and Internet	10
2.2 ASEAN and ASEAN Community	14
2.2.1 Why is ASEAN Community Important?	14
2.2.2 What is ASEAN?	15
2.2.3 History of ASEAN.	16
2.3 Computer/Online Games and Children.	19
2.3.1 Understanding what is motivation	19
2.3.2 Game base learning	19
2.3.3 Motivation and game based learning.	20
2.3.1 Flash-based learning approach.	21
2.4 Analysis on related projects	23
2.4.1 Children’s Game in South-East Asia	23
2.4.1 Cute Cultures Game	24
2.4.2 My Culture Quest	24
2.4.3 The China Game	25
2.4.4 Flags Flags Game	26
2.4.5 National Clothes Game	26
2.4.6 World Class Chef: Japan	27
2.4.7 Edwin Van Moon, Balloon Tycoon	27
2.4.8 Summary of related projects	29
2.5 Augmented Reality.	32
2.5.1 What is Augmented Reality?	32
2.5.2 Augmented Reality and Education.	33
2.6 Proposed Solutions	35
CHAPTER 3: METHODOLOGY	36
3.1 Research Methodology.	36
3.2 System Architecture	38
3.3 Activity Diagram and Use Case Diagram.	39
3.4 Lesson and Game Design	40
3.5 Graphical User Interface	40
3.7 Development Tools	41

CHAPTER 4: RESULT AND DISCUSSION	45
4.1 System Interface, Lesson and Game Screenshots	45
4.1.1 Homepage	45
4.1.2 “Know ASEAN” menu page	46
4.1.3 What is ASEAN	46
4.1.4 History of ASEAN	47
4.1.5 Member of ASEAN	47
4.1.6 Future of ASEAN	48
4.1.7 “Play Games” Game Menu Page	49
4.1.8 Geography Game	49
4.1.9 Food Game	50
4.1.10 Local Costume Game	50
4.2 Evaluation Results	51
CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS	56
5.1 Conclusions	56
5.2 Recommendations	57
REFERENCES.	58
APPENDICES.	62
7.1 Questionnaire	62
7.2 Key Milestones.	64
7.3 Gantt Chart	64
7.4 Technical Paper	66

LIST OF FIGURES

Figure 2.1: Homepage of SEAsite	11
Figure 2.2: Homepage of China Family Adventure	12
Figure 2.3: Homepage of Kids Web Japan	13
Figure 2.4: Three pillars of ASEAN Community and its Blueprint	15
Figure 2.5: Map of ASEAN and flag of member states	16
Figure 2.6: ASEAN Emblem	17
Figure 2.7: Children’s Game in South-East Asia	23
Figure 2.8: Cute Cultures Game	24

Figure 2.9: My Culture Quest Game	24
Figure 2.10: The China Game	25
Figure 2.11: Flags Flags Game	26
Figure 2.12: National Clothes Game	26
Figure 2.13: World Class Chef: Japan Game	27
Figure 2.14: Edwin Van Moon, Balloon Tycoon Game	27
Figure 2.15: How AR looks like	32
Figure 2.16: MagicBook	34
Figure 3.1: Throwaway Prototyping Methodology	36
Figure 3.2: System Architecture	39
Figure 3.3: Use Case Diagram	40
Figure 3.4: Activity Diagram	41
Figure 3.5: Early Designs for the Homepage Screen for the ASEAN 4 Kids	42
Figure 3.6: Early Designs for the Homepage Screen for the ASEAN 4 Kids	42
Figure 3.7: Characters	43
Figure 4.1: Homepage of the System	45
Figure 4.2: “Know ASEAN” Menu Page	46
Figure 4.3: What is ASEAN Lesson	46
Figure 4.4: ASEAN Timeline	47
Figure 4.5: Cambodia Introductory Page	47
Figure 4.6: Member of ASEAN Lesson	48
Figure 4.7: Future of ASEAN Lesson	48
Figure 4.8: “Play Games” Menu Page	49
Figure 4.9: Geography Game	49
Figure 4.10: Food Game	50
Figure 4.11: Local Costume Game	50
Figure 4.12: System Testing	51
Figure 4.12: Knowledge about ASEAN (pre-survey)	52
Figure 4.13: Knowledge about ASEAN (post-survey)	53
Figure 4.14: Users’ feedback for the system testing	54

LIST OF TABLES

Table 2.1: Summary of related projects	29
Appendix:	
Table 1: FYP1 Milestone	64
Table 2: FYP2 Milestone	64
Table 3: Final Year Project 1 Gantt Chart	65
Table 4: Final Year Project 2 Gantt Chart	65

ABBREVIATIONS AND NOMENCLATURES

ASEAN	Association of Southeast Asian Nations
ASCC	ASEAN Socio-cultural Community
ASC	ASEAN Security Community
AEC	ASEAN Economic Community
AFTA	ASEAN Free Trade Area
AR	Augmented Reality
VR	Virtual Reality

CHAPTER 1

INTRODUCTION

1.1 BACKGROUD OF STUDY

The history of the Association of Southeast Asian Nations or ASEAN can be traced back to its origin on 8 August, 1967 when the leaders of five founding members namely the Republic of Indonesia, Malaysia, the Republic of the Philippines, the Republic of Singapore and the Kingdom of Thailand signed the ASEAN Declaration (Bangkok Declaration) in Bangkok, Thailand. This marks the official establishment of ASEAN. ASEAN continues to grow bigger when Brunei Darussalam joined on 7 January 1984, followed by the Socialist Republic of Vietnam on 28 July 1995, the Lao People's Democratic Republic and the Union of Myanmar on 23 July 1997. And finally the Kingdom of Cambodia on 30 April 1999, completing the ten member states as today.

The primary goal of ASEAN in the beginning is to strive for peace and security in the Southeast Asia. However, in January 1992, the leaders of all member countries has agreed to take on another step to improve their trade liberalization efforts to a higher level by setting up ASEAN Free Trade Area (AFTA). In December 1997, ASEAN leaders have come to agreement to establish ASEAN Vision 2020, a long-term road map for the growth of ASEAN. In 2003, leaders of ASEAN have launched their decision to establish an ASEAN Community – the regional community comprising of three different pillars: an ASEAN Socio-cultural Community (ASCC), an ASEAN Security Community (ASC) and an ASEAN Economic Community (AEC). The ASEAN Community is aimed to achieve by the year of 2015.

This year ASEAN celebrates its 45th year anniversary with more than a total of 500 million populations with a combined gross domestic product of with a gross domestic product equal to China's (Rodolfo, 2002) ASEAN is now on its journey towards becoming an ASEAN Community and a Zone of Peace, Freedom and Prosperity.

As the ASEAN Community get closer each day. Sooner or later, ASEAN will become part of people's daily life, for example in trading, education, working, travelling, and other regional cooperation. Thus, it is important to create the awareness and basic understanding of the ASEAN Community and the association to the people especially to young children as they are the future generation that will one day become the leaders and help in developing the region as well as improving the betterment of people in the region. However, knowledge about the ASEAN Community and the association are still poorly integrated in today's learning of young children. This research is aimed to fulfill this gap.

1.2 PROBLEM STATEMENT

In line with ASEAN vision 2020; all leaders of ASEAN has come forward at the 12th ASEAN Summit in January 2007 to affirm their commitment to bring the idea of ASEAN community to reality by 2015. The ASEAN Community is a regional community comprising of three different pillars: an ASEAN Socio-cultural Community (ASCC), an ASEAN Security Community (ASC) and an ASEAN Economic Community (AEC). It aims to create a regional stable community with durable peace and shared prosperity.

Among those three pillars, the ASEAN Economic Community is among the hot topics being discussed in all country states. AEC aims to transform ASEAN into a single market and production base. A highly competitive economic region with free movement of goods, services, investment, skilled labour, and freer flow of capital (ASEAN Secretariat, 1992) This bring about many of opportunities as well as threats to all country states. The countries that are well-prepared will definitely enjoy lots of benefit from the AEC. However, to be able to gains those benefits, a country must ensure that their citizens are equipped with basic needed skills and knowledge in order to interact with other people from different countries. Among these is ability to understand the basic knowledge about other country such as language, culture and traditions, etc.

A study conducted by two researchers from Singapore and Thailand in 2007 and was commissioned by the ASEAN Foundation has shown that knowledge of undergraduate students regarding ASEAN are still varies from country to country. The research aimed to

assess ASEAN knowledge and awareness among undergraduate students of 10 universities in ASEAN. The result of the study shows that, on average, students could list nine out of ten ASEAN countries. Moreover, the student could identify seven on a map of Southeast Asia and only about 70% of the students could identify the flag of each country. However, the knowledge of students varies from country to country. Vietnam and Lao PDR show the greatest sense of familiarity with ASEAN while Brunei Darussalam, Singapore and Myanmar show the least sense of familiarity (Thompson & Thianthai, 2008). This indicates that there is significant knowledge gap about ASEAN among the youths. Therefore, this project aims at building a basic knowledge understanding of ASEAN and its cultures to the young children in the region, more specifically to the primary school children.

One of the problems identified during finding stage is that children nowadays seem to have their passion for learning shrink as they grow. Learning often becomes associated with drudgery instead of delight. Many of students these days are physically present in the classroom but largely mentally absent; they fail to invest themselves fully in the experience of learning. This is due to the ineffective of the traditionally teacher-centered didactic instruction which put teacher as a center of learning instead of students. Moreover the classical text-based learning are no longer applicable to children these days as they are often attracted by the entertaining sound and light effects in multi-media instead of the normal text-based medium. In other word, they lack of motivation in learning which can be considered as a drive force in pushing them to learn.

Another problems arose during the finding stage of this project is the lack of culture teaching application for children. Currently, there are not many of educational applications that mainly focus on culture teaching in children available in the market. Moreover, most the culture teaching applications in the market are only focus on a single aspect of culture rather than culture as a whole such as language, food, traditional costume, etc. As of the finding, there are very few of educational applications in the market that actually integrate various aspects of culture. Furthermore, most of them focus on culture of individual country.

As for ASEAN, to date, there are few ASEAN computer games that made available online such as Children's Game in South-East Asia, ASEAN Chronicles - The Legend of the Golden Talisman and ASEAN Quest. The goals of these games were to raise awareness of ASEAN, its people, places and cultures, and to inform and educate youths about ASEAN member countries. Unfortunately, two of these games are no longer available for download. This creates an issue when teachers or parents who wish to use these games as a reference tool to teach about ASEAN to their students/children. Hence, there is a need to produce an interactive educational application to use as a reference tool for teaching ASEAN culture to children.

In conclusion, problems statements for this project are:

- There is significant knowledge gap about ASEAN among young generation.
- Students are lack of motivation in learning due to the ineffective of a traditionally teacher-centered instruction and text-based learning.
- Limited number of culture teaching applications that integrate various aspects of culture.
- Very few existing application in the market that focuses on teaching ASEAN Culture

1.3 OBJECTIVES

The objectives of this project are as follows;

1. To raise awareness and understanding of ASEAN, its people and cultures to primary school students through ICT.
2. To design and develop a web-based interactive application that encourages primary school students to learn some basic knowledge about ASEAN and culture of each member countries.
3. To explore the use of game-based approach in promoting culture learning.
4. To evaluate the effectiveness of the application in learning ASEAN culture.

1.4 SCOPE OF STUDY

The primary objective of this project is to develop an interactive web based game to teach young children about ASEAN and its country members. The game is designed specifically for primary school children and will be used throughout ASEAN. Therefore, the first task for this project is to study about ASEAN – its history, policy, as well as basic knowledge of its country members. Besides, another main task is to study about nature of children, culture learning in young children.

The software platforms that will be used in this project are Adobe Flash CS4 which will be used for developing the main contents of the game and Adobe Illustrator CS4 for creating graphic which will be imported into Adobe Flash. Since the game will incorporate some element of Augmented Reality (AR), another main tool used is FLARToolKit – a Flash Actionscript (v3) which can be used to develop a flash-based AR application.

1.5 LIMITATION

The limitation of the system is Internet connection since the system will be a web based application. The speed of Internet will determine the amount of time that will take to download the system. It is advisable for parents to invest on high speed internet in order to avoid disruption while children are playing game.

1.6 FEASIBILITY STUDIES

1.6.1 Technical Feasibility

Taking into account familiarity of developer with tools and technology used, project size and duration, the project is considered to be moderate technical from developer point of view.

In terms of familiarity of developer with tools and technology used, both developer and users are familiar with web-based and Flash application. However, Augmented Reality (AR) technology seems to be something new to developer as it did not included in university syllabus. Nevertheless, with proper planning and research done, developer should be able to understand basic knowledge of AR and able to incorporate it into the system.

The size of the project is small; duration to complete the whole project is approximately eight months which can be divided into two semesters. The first semester will be reserved for research purposes. The research will mostly covers about ASEAN and culture learning in young children. Besides, research on similar application is also crucial to help developer to get an idea on how to design and build the system that suit the need of the children. Another remaining semester will be reserved fully for development purposes as well as some related paper works. Approximately four months of time for development of the system should be enough to complete the whole system.

1.6.2 Economic Feasibility

The primary goal of this project is to produce an interactive game for young children to learn basic knowledge about ASEAN. The project requires no cost for development purpose. However, since the game will be a web based application, therefore, there will be a cost for a domain registration as well as cost for hosting of the website. Therefore, the project is considered to be economic feasible as the overall cost is low.

1.6.3 Organizational Feasibility

Game is well-known to be one of the effective tools to teach young children to learn basic knowledge of any topics. It gives children a fun and interactive learning experience. For this project, the game will be used by primary school children throughout ASEAN. Parents and school can log in to website to let the children use the system. The game is designed to suit the need of primary school children which always eager to learn new things especially new technology i.e. Augment Reality. Hence, the system is organizational feasible in the perspective of school and parents.

CHAPTER 2

LITERATURE REVIEW

2.1 CULTURE

2.1.1 Definition of Culture

The definition of the word culture is difficult to define due to its complex nature. There is no one specific definition that can fully describe what is culture. Hinkel (1999), states that there are “as many definitions of culture as there are fields of inquiry into human societies, groups, systems, behaviors and activities”. Culture in broadest meaning can be described as all environment created by human for all our thoughts and actions (Tepperman, Curtis, Wilson & Wain, 1994). Culture usually comprises of “*history*, geography, institutions, literature, art and music as well as scientific, economic, sports and other achievement that are valued and that people take pride in” (Saluveer, 2004).

Culture generally would mean art, literature, customs and everyday life peculiar to a certain group. However, culture can also include invisible features such as belief, norms and attitudes. The definition that combines both aspects of culture is given by the *New Encyclopedia Britannica*. It says that culture is

...behavior peculiar to Homo sapiens, together with material objects used as an integral part of this behaviour; specifically culture consists of language, ideas, beliefs, customs, codes, institutions, tools, techniques, works of art, rituals, ceremonies, and so on (1991:874).

From all mentioned definitions, one could see that the definitions of culture are very broad and vary from one scholar to another. It usually includes all visible activities that human takes part in as well as invisible features embedded in human thought. Therefore, History is also included as part of Culture as it involves the study of past events, the development of a people or institution.

2.1.2 How Culture are taught in school

The goal of teaching culture is to facilitate students to develop the cultural understanding, attitudes and performance skills needed to interact appropriately with other segment of another society and to communicate with people socialized in that culture (Seelye, 1993). To achieve those goals, several of different approaches to the teaching of cultures as well as some techniques have been introduced by several of scholars. To choose the right approach or technique requires the teachers to take into account all relevant factors that may affect the instruction for example the learner's age, maturity, command of language, the preference of teacher himself, and educational level.

The teaching of cultures can take place in various situations. Stern (1992) differentiates the three most common situations that culture teaching can take place:

1. Culture is taught in language course; in this case student will be removed physically as well as psychologically from the reality of the second culture. Culture teaching will serve as a background for student to visualize the reality. This is the most widely used situation in culture teaching in various countries.
2. Culture is taught in situation, this approach will bring student to visit a new environment. Usually student will be physically far away from the culture, but they will be psychologically motivated to learn.
3. Culture is taught in cultural setting (e.g. to immigrants). This case requires teacher to help students to understand the foreign culture in order to avoid any misunderstandings. This is by far one of the best situations for second language and culture teaching.

Besides the mentioned approaches, there are many more of approaches of culture teaching being used in most schools. For example the mono-cultural approach which focuses only on the culture of a single country whose language is being studied, the comparative approach where the learner will be emphasized that learning foreign culture should be related to learner's own culture, the topic-based approach which concentrate on more general topics that involve various cultural issues, etc.

2.1.3 Culture and Internet

The development and spread of the internet has made huge impacts and created many new possibilities for teaching culture (Saluveer, 2004). One of the ways to teach culture in this era is through internet. Nowadays there are lots of website provide a learning platform for students to learn different types of culture worldwide. This section provides some of websites that provide culture learning material online for students to access anytime and anywhere.

2.1.3.1 SEAsite (www.seasite.niu.edu)

SEAsite is a website that provides an Interactive Learning Resources for Southeast Asian Languages, Literatures, and Cultures. The site is funded by The International Education and Graduate Programs Service of the U.S. Department of Education as part of the Undergraduate National Resource Center Program. The layout and color scheme of the site are very plain and simple. However, the site provides very comprehensive sources for learning languages, literatures and cultures of Southeast Asia. Each country will have its own dedicated page where users can learn its country at a glance, its people, culture, language, etc.

The author personally finds the site very useful for people who wish to learn more about Southeast Asia. However, its plain and boring template are the factors that may distract users from learning the educational contents. The site does not provide much of interactive contents where users can play with the contents.



Figure 2.1: Homepage of SEAsite

2.1.3.2 China Family Adventure (www.china-family-adventure.com)

China Family Adventure is a website founded by one Chinese lady who now lives in Germany. The site was founded many years ago when she planned to visit China with her children. Unfortunately, at that time there were few resources for traveling to China with children. Most of it was scattered all over. That is how the site was built.

The site provides very comprehensive information about China in various aspects. It contains most of information that travellers needs to know when travelling to China with children. It also provides a general knowledge on Chinese culture that young children should when they are in China.

The author finds the site interesting and will be very useful for those planning to travel to China with children. It is a one-stop portal where the travellers should look for information about China. The very basic portal-look of the site with a warm color of orange and gives users a good place for users to start their journey. Nevertheless, the site which also targets the young children somehow is not kids-friendly. The site will be more attractive to young children if it gives a more interactive and fun ways to learn all the contents inside.



Figure 2.2: Homepage of China Family Adventure

2.1.3.3 Kids Web Japan (www.web-japan.org/kidsweb/index.html)

Kids Web Japan is a website that provides comprehensive information about Japan. The target audience of the site is school children aged 10 to 14 who live outside of Japan. The site is sponsored by the Ministry of Foreign Affairs of Japan (MOFA). The site lets children explore Japan in various different aspects from Society to Culture and many more. As the site caters for young children, therefore, it was carefully designed to meet the need of young children. It provides not only lengthy articles about Japan, but also many different games that let students explore Japan through the games.

The author finds this site a very good and useful website for young children who want to learn about Japan in more fun and exciting ways. The only drawback of the site is that most of the articles are very lengthy which does not suit the nature of the target audience who like to learn in a fun way not by reading a lengthy text.



Figure 2.3: Homepage of Kids Web Japan

In conclusion, it is undeniable that technology has changed how students learn history. Internet has made most information available at our fingertips. One of the problems in most culture teaching sites nowadays is that most of the sites are not kids-friendly in a sense it does not cater to children's needs. Most of them are flooded with lengthy text and pictures. The sites are not interactive enough to let children enjoy while they are learning.

2.2 ASEAN AND ASEAN COMMUNITY

2.2.1 Why is ASEAN Community Important?

With the ASEAN community coming into effect in 2015, it is important to all of us as a citizen of ASEAN to understand the basic idea of ASEAN Community as well as how does it going to affect our daily life. ASEAN Community is an idea whereby all countries members of ASEAN will come forward to form a regional community founded on three different pillars namely an ASEAN Socio-cultural Community (ASCC), an ASEAN Security Community (ASC) and an ASEAN Economic Community (AEC) (ASEAN Secretariat, 1992).

The ASSC aims to create a community that members are bonded together and live in a caring society whereas the goal of ASC is to bring peace to the region by ensuring that each member lives harmoniously and peacefully with each other as well as the world at large. The AEC is to increase the overall competitiveness of the region and to further improve economic cooperation among member states. AEC will transform ASEAN into a region with single market and production base with free flow of goods, services, capital and skill labours. (Guerrero, 2010)

Each of the three pillars will definitely affect citizen of ASEAN in one way or another. From economic point of view, ASEAN community which will transform the region into a single market will definitely bring about drastic changes to the region. Generally, single market will create a more competitive environment whereby each member states will face more competition from outside. This will somehow subsequently reduce the overall cost of goods and services in the region. Many of trade barriers will be removed resulting in more of employment opportunities for the people. This factor will help in improving the standard of living of the people as well as reduction in the numbers of poverty. Free flow of labour will cause an influx of labour from neighboring member states. Thus, it is important for all local labours to prepare themselves in such a way that they will be able to compete with foreign workers. Several of opportunities as well as threat can still be seen from the establishment of ASEAN Community. With only three years to go, there is an urgent need for intense communication, socialization and dialogue on the ASEAN

Community. It is responsible for both local government and the people to start realizing the importance of ASEAN Community and how it will affect them. Knowledge about the region and neighboring countries are among the basic factor that can contribute to the success of business. Business will not be able to compete with other countries if they fail to understand their culture, language, norm, politics, etc. Hence, there is a need to educate people of ASEAN about the association as well as their neighboring countries.



Figure 2.4: Three pillars of ASEAN Community and its Blueprint

2.2.2 What is ASEAN?

ASEAN stands for The Association of Southeast Asian Nations. ASEAN is a group of ten countries located in Southeast Asia that encourages political, economic, and social cooperation in the region. Members of ASEAN are Brunei Darussalam, the Kingdom of Cambodia, the Republic of Indonesia, Lao People’s Democratic Republic, Malaysia, the Union of Myanmar, the Republic of the Philippines, the Republic of Singapore, the Kingdom of Thailand and the Socialist Republic of Vietnam (ASEAN Secretariat, 1992).

ASEAN covers a land area of 4.46 million km², which is 3% of the total land area of Earth, and has a population of approximately 600 million people, which is 8.8% of the

world's population. The sea area of ASEAN is about three times larger than its land counterpart. The motto of ASEAN is "One Vision, One Identity, One Community".

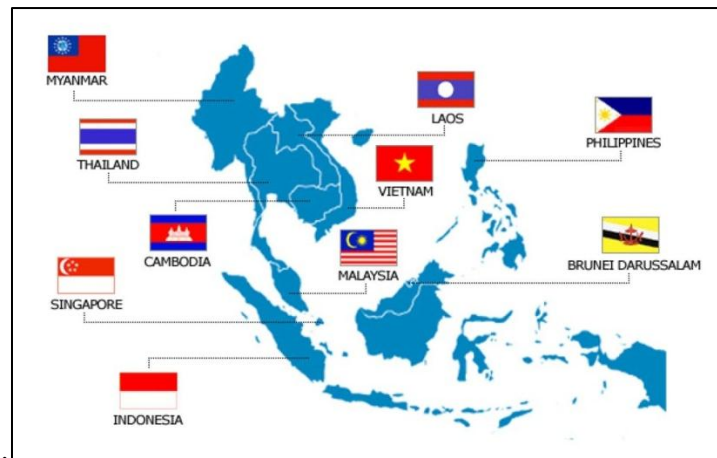


Figure 2.5: Map of ASEAN and flag of member states

2.2.3 History of ASEAN

The origin of ASEAN began when leaders of five founding fathers which are Indonesia, Malaysia, the Philippines, Singapore and Thailand came down to Bangkok, Thailand to discuss the idea of forming a regional organization for Southeast Asian nations. The result from the discussion was the signing of the Bangkok Declaration (ASEAN Declaration) on 8 August, 1967 to declare the formation of The Association of Southeast Asian Nations (ASEAN). The five founding members were represented by Adam Malik of Indonesia, Narciso R. Ramos of the Philippines, Tun Abdul Razak of Malaysia, S. Rajaratnam of Singapore, and Thanat Khoman of Thailand (ASEAN Secretariat, 1992).

Brunei Darussalam becomes sixth member of ASEAN on 7 January 1984 six days after its independence, followed by the Vietnam on 28 July 1995, Lao and Myanmar on 23 July 1997. And the last member to join was Cambodia on 30 April 1999. This comply to the statement in the ASEAN Declaration that the organization are open for participation to all Southeast Asian countries which share the same aims and purpose with the organization (ASEAN Charter, 2007)



Figure 2.6: ASEAN Emblem

Figure 1 depicts the ASEAN Emblem. The Emblem consists of four colours; blue, red, white and yellow. The blue represents peace and stability. Red depicts courage and dynamism. White shows purity and yellow symbolizes prosperity. The ten stalks of paddy represent each country members which are bonded under ASEAN.

The ASEAN Declaration laid out seven aims and principle for the association which consists of following items (Institute of Southeast Asian studies, 2010);

- Economic growth, social progress and cultural development
- Regional peace and stability
- Economic, social, cultural, technical, scientific and administrative collaboration
- Mutual assistance in training and research
- Collaboration in agriculture and industry, trade, transportation and communications and the improvement of living standards
- Promotion of Southeast Asian studies
- Cooperation with regional and international organizations

To date, ASEAN has made its long journey serving people of Southeast Asian countries for more than 45 years. ASEAN has managed to achieve many of its goals set forth in the ASEAN Declaration. One of the biggest achievement as a regional organization is the contribution in creating a stable and peaceful region without a conflict among country states. Up until now, there are none of states have gone to the war with other member states. In fact, ASEAN has help to strengthen relationship among countries states which

contribute to the promotion of regional peace and stability through abiding respect for justice and the rule of law and adherence to the principles of the United Nations Charter. (ASEAN Secretariat, 1992; Institute of Southeast Asian studies, 2010).

Besides, ASEAN has also largely contributed in helping country members to improve their economic conditions by many means for example in a form of regional cooperation i.e. ASEAN Free Trade Area (AFTA). AFTA was established in January 1992 with an aim to reduce tariffs on a wide range of products among member states. It also strives to eliminate the non-tariff barriers and other cross-border measures AFTA in a way will help to transform ASEAN into a single production base with more than 500 million consumers (Pasadilla, 2004).

ASEAN has taken further step to realize the importance of regional cooperation with an idea to form an ASEAN Community under ASEAN Vision 2020 (ASEAN Secretariat, 1992). The idea was recommended by the ASEAN Heads of Government in November 2002 to form an ASEAN Economic Community (AEC) by 2020. The idea was discussed further among leaders and they have agreed to pursue comprehensive integration towards the establishment of an ASEAN Community by 2020 instead of AEC alone. ASEAN Community is a regional community founded on three different pillars: an ASEAN Socio-cultural Community (ASCC), an ASEAN Security Community (ASC) and an ASEAN Economic Community (AEC). However, after much deliberation among ASEAN leaders, the leaders have made a decision to bring forward the timetable of achieving ASEAN Community from 2020 to 2015 (Austria, 2012).

2.3 COMPUTER/ ONLINE GAMES AND CHILDREN

2.3.1 Understanding what is motivation

Motivation is one of the main factors in determining how successful the learning is. Many of researchers have given the definition of what is motivation. Munn et al. defined that motivation, as a sort of intrinsic power such as interest, attitude and desire, can influence personal behavior (Munn, Dodge & Femald, 1969). On the other hand, Keller regarded motivation as people's choice of experiences and goal, and how they make efforts to achieve them (Keller, 1983). Besides, Reilly, Lewis & Tanner considered motivation to be the power inside oneself (Reilly, 1983). Hence motivation can be regarded as the process that initiates, guides and maintains goal-oriented behaviors. Motivation is what causes us to act, whether it is getting a glass of water to reduce thirst or reading a book to gain knowledge.

2.3.2 Game based learning.

Technology is growing rapidly over a year; it has made huge differences in how people live nowadays. It is inevitable that technology has influence people's life in one way or another. The use of technology is no longer restricted among technology geek but has widespread to people at all age including young children. Most of parents nowadays are eager to let their children exploring new technology where children can learn and play at the same time (Verenikina & Herrington, 2008).

Technology has now become part of most people's life. It has penetrated into various parts of society resulting in huge difference in how people live. Education has also adopted technology to be part of learning and teaching process. The use of technology in education has made a big impact in how children learn. Games are among technological tools being used as a medium in children's learning activity. The use of games in learning has actually changed so much in how our brain works. The widespread use of video games in society has actually re-wired our brain which causes the traditional learning method to be less effective (Prensky, 2001)

There are several of studies that support the ideas of incorporating game into a learning process. Flintoff (2002) states in his study that games are actually enhancing students' memory capacity, at the same time it also help to retain student attention and help them in the process of problem solving strategies which can indirectly improve their academic performances. Another study has revealed that games are not only motivating children but can also help in engaging and learning a serious academic contents (Garner, Brown, Sanders, & Menke, 1992).

However, there are many concerns among educators in terms of how games can be applied to education, and how to design and development educational games that can really help student in learning process. To take full advantages of using games a medium in learning, the creators of the games must ensure that the educational contents of the game are well-integrated into the structure of the game (Shalom, 2010). Research has also suggested that the games will be effective when it is designed in a pedagogical manner suitable for young children, in a manner that will allow them to explore, solve problem, look things up, and do activities which promote communication, interaction, discovery and problem solving (Downes, Arthur, & Beecher, 2001)

Currently, there are many of educational games available in the market both online and off-line. The games are available in various genres. However, there are not many games that actually incorporate Flash and Augmented Reality together. Most of the educational games available in the market are mostly based solely on Flash. Moreover, the contents of most of games are much similar for example, learning alphabet, numbers, language, etc.

2.3.3 Motivation and game based learning

Sustaining students' attention while learning is among one of the top challenges faced by many of today's educators nowadays. Successful learning requires motivation (Prensky, 2003). Motivation is a very important factor for primary school students in learning. Primary school student which by nature has very poor attention towards learning, this in a way leads to a lack of motivation in learning. Nowadays, traditionally teacher-centered

didactic instruction is progressively substituted by student-centered various interactive learning patterns (Prensky, 2001). Using computer games is one of the very effective ways to increase students' learning motivation as it takes both entertainment and education into consideration. According to Prensky, game based learning will be the main learning pattern in the 21st century; the traditional learning style such as emphasizing reading and writing is going to be replaced. Several of studies has support the use of game based learning in education, a series of studies show that e-learning which includes game based learning are not only triggers users' intrinsic motivation, but also arouses peer cooperation and coordination (). Therefore, game based learning can play a very important role in learning of primary school students as it helps to improve students' motivation towards learning by allowing them to learn through game.

However, many problems arose in game based learning, game based learning can enhance student's motivation except when students are focusing too much on playing games instead of learning itself.(Kuan, 2001) Children and adults are often attracted by the entertaining sound and light effects in multi-media games. Students' learning motivation must be maintained so that teaching activities could move on (Reod and Bium, 1998). In Mitchell and Savill's study, if game based learning turns into game addiction, game type learning will brings down learner's motivation. This is where teacher play a role in assisting learning of student and ensure that their motivation is being maintained. Thus game based learning will be a very effective tool in enhancing student's motivation in leaning, however, the teachers must ensure that students are not focusing too much on the game instead of the educational contents and guarantee the their motivation is being maintained.

2.3.4 Flash-based Learning Approach

Retaining student's attention in class is a big challenge faced by most of primary school teachers. This is due to psychological characters of young children that have poor attention and somehow will not last long (Ye & Cai, 2012). Currently there are quite a number of approaches being used to overcome this problem. Among those is the use of

multimedia in education. A research has shown that multimedia instructional environments are proved to have a strong potential to improve the way people learn (Mayer, 1999). Therefore, multimedia has a big role to play in enhancing the learning methods that will help to retain student's attention in class.

Research indicates that student can memorize only 20 percent of the content they learn, an increment to 40 percent if they could see and hear. In fact, people are capable of memorizing the contents up to 75 percent if they see and hear simultaneously (Neo & Neo, 2001,). This is where Flash application comes into picture as it allows students to see and hear at the same time while they are learning.

Flash application is a well-known authoring environment for creating animation and multimedia. Flash is a first choice for educational software developers as it excels in many aspects such as image design, animation creation, and interaction implementation. A result from the study has shown that flash-based application can have a great impact in helping students to learn, strengthen motivation and extend duration of student's attention towards the lesson (Ye & Cai, 2012). Therefore, flash-based educational application has a strong potential in enhancing a classical learning methods that will promote a learning environment that allows student to fully utilize their skills.

2.4 ANALYSIS ON RELATED PROJECTS

Nowadays there are numbers of educational web-based games available online which allow users to play and learn at the same. In order to develop a new one, it is important for the developer to study the existing one. This section aimed to study the similar applications that made available online. Most of the games that will be studied are online educational games that focus on culture teaching.

2.4.1 Children's Game in South-East Asia



Figure 2.7: Children's Game in South-East Asia

Description from the site: The Asia-Pacific region has one of the richest repositories of intangible cultural heritage including traditional children's games, the cultural elements that are said inseparable from community life.

This UNESCO's user-friendly English CD is designed to provide school teachers alternative guidelines in planning class activities as well as to encourage children to use those games in their own playgrounds.

2.4.2 Cute Cultures



Figure 2.8: Cute Cultures Game

Description from the site: “Cute Cultures, in this game, you can have a test that what kind of culture you mood match by answering some questions. Just pick the image that matches your mood best. After ten questions, you will see the cute culture identity for the day! Click on your options to continue this skill game. You may have different culture identity on different day! Just have a try here! ”

2.4.3 My Culture Quest



Figure 2.9: My Culture Quest Game

Description from the site: “My Culture Quest opens up the world of museums and galleries, giving you the opportunity to explore objects from many different countries and answer questions correctly in order to create your own exhibition.”

2.4.4 The China Game



Figure 2.10: The China Game

Description from the site: “Geography based china history quiz game. This flash interactive is based on the board game Feilong: The China Game. A fun-to-play educational game expressly designed for Families with Children from China, Asian Studies educators and students, and others interested in testing and expanding their knowledge of the culture and history of one of the world's most fascinating countries - CHINA.”

2.4.5 Flags Flags



Figure 2.11: Flags Flags Game

Description from the site: “Brush up on your mapping skills and social studies with Flag Flags. This fun geography game lets kids click and drag the flags to their correct location on the map”

2.4.6 National Clothes



Figure 2.12: National Clothes Game

Description from the site: “Dress this cute girl in a variety of clothes from around the world. Simply click on the country flags on the right hand side to view the traditional clothes from that country. Then drag and drop the clothes onto the girl once you have chosen what you like.”

2.4.7 World Class Chef: Japan



Figure 2.13: World Class Chef: Japan Game

Description from the site: “Japanese cuisine has developed over the centuries as a result of many political and social changes. The cuisine eventually changed with the advent of the Medieval age which ushered in a shedding of elitism with the age of shogun rule. In the early modern era massive changes took place that introduced non-Japanese cultures, most notably Western culture, to Japan.”

2.4.8 Edwin Van Moon, Balloon Tycoon



Figure 2.14: Edwin Van Moon, Balloon Tycoon Game

Description from the site: “Hi, I'm Edwin Van Moon! I'm travelling the world in my hot air balloon! Will you help me find my way around? Don't worry, it's easy... if you

know your world geography! Just move the cursor with your mouse, and my balloon will follow it. Lead me to the countries I want to visit, then click on them to get a passport stamp. Ready? Let's go! ”

Table 2.1: Summary of related projects

Name	Description and comments	Approach
Children's Game in South-East Asia	Children's Game in South-East Asia is an offline flash-based game aims at introducing the traditional games in South-East Asia to the young generation. The game consists of several of sub-games that let users play a simulation of real traditional games. The game not only gives users an enjoyable moment but also provides some relevant information about each and every of traditional games. Besides the games also include the video which will allow users to see how the real games are played. The only drawback of the game is that the games focus only on traditional games in South-East Asia, not other aspects of culture.	-Adventure -Puzzle -Role Playing
Cute Cultures	Cute Culture is a game where it allows user to choose series of pictures that best represent their mood of the day. The game will then analyze those pictures and generate the cute culture identity for the day. After that, user will be asked series of questions with regards to the country of that particular cute culture identity, for example capital city, currency etc. The game targets young children which aim to help those children to learn some basic knowledge about various countries worldwide.	- Quiz

My Culture Quest	My Culture Quest is a game that allows users to travel around the world to collect some important objects to display at their museum. Upon arrival at each country users will be asked question with regards to that country. If user answers it correctly they will be rewarded with the object they are looking for. If they fail to answer the question they will be rewarded with nothing. Once users have collected all items, all items will be arranged into an exhibition. Users will then be given a score based on the success of the exhibition.	<ul style="list-style-type: none"> -Adventure -Quiz -Role Playing
The China Games	The China Game is a history quiz game that will let users travel around China. Upon arrival at each destination users will be asked question about China. If they answer it correctly they will be given some marks and otherwise if the answer is wrong.	<ul style="list-style-type: none"> -Adventure -Quiz
Flags Flags	Flags Flags is a mapping game that helps users to improve their mapping skills. The game will displays a world map with blank flags on various countries. Users need to match the given flag on the right hand (see Figure 2.4) with those blank flag on the map. The game will also enhance knowledge on geography as users require matching the flag with world map.	<ul style="list-style-type: none"> -Puzzle -Mapping

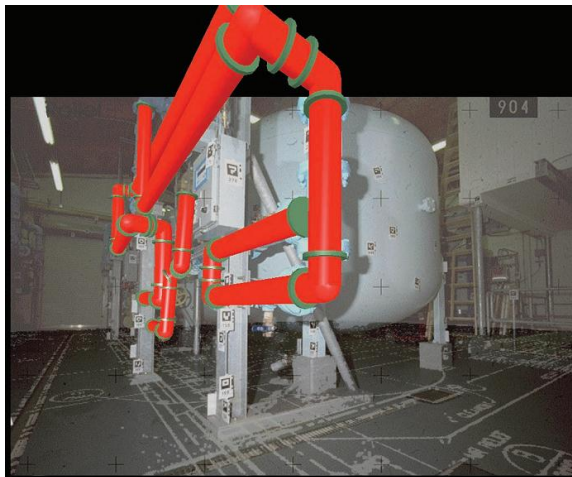
National Clothes	The goal of National Clothes game is to help children learning traditional costume from countries around the world. The children will be able to learn the traditional clothes from various countries while they are enjoy dressing the girl	-Role Playing
World Class Chef: Japan	World Class Chef: Japan is a Japanese cooking game that allows users to learn some basic knowledge and recipe about Japanese food. The game enables user to explore how to cook Japanese food by making it themselves. It will give instruction to user step by step until the food is ready to be served.	-Role Playing
Edwin Van Moon, Balloon Tycoon	Edwin Van Moon, Balloon Tycoon is a game where users need to help Edwin Van Moon to travel around the globe. The game will give instruction to users where to lead Edwin to. Users will be able to see the world map at large allowing them to see where they are moving to (see Figure 2.14)	-Adventure

2.5 AUGMENTED REALITY

2.5.1 What is Augmented Reality?

The clear definition of Augmented Reality (AR) is still ambiguous among researchers despite its long existence. The clear and most cited definition of AR was given by Azuma in 1996; he stated that AR is a variation of Virtual Reality (VR). VR create the environment where the user can interact with the virtual world in real time. However the users will be completely immerse inside a synthetic environment. While immersed, the user cannot see the real world around him (Azuma, 1996). Whereas in AR environment, the user does not fully immerse inside virtual world, users can still able to see the real world at the same time as virtual object attached to real locations and objects (Billinghurst, 2002). Three characteristics of AR had been identified by Azuma which are rendering the virtual and real object together, interaction in real time and registration in 3D.

Figure 1 depicts the picture of how AR looks like. It shows a two-dimensional shop floor plant with a real industrial pipeline in it. Inside the plants there is a 3D pipe model superimposed on an industrial pipeline. Both real and virtual object coexist in the same physical environment.



2.5.2 Augmented Reality in education

In learning environment, students' motivation and engagement in learning is important. As stated by many researchers, students who are motivated to learn are more likely to succeed in education and pose more chances to complete the given tasks than those who are not motivated (Csikszentmihalyi, 1991; Efklides, Kuhl, & Sorrentino, 2001; Keller, 1979; Schmidt, 2007). Hence it is important to create the learning environment and activities which motivate and encourage the students to take part in the activities. In today's learning class, the current research showed that many students are still lack of interest in learning and less motivation (Perez-Lopez, Contero, & Alcaniz, 2010). The traditional teaching method through the use of book based learning and teacher giving the lecture in front of the class make the students become easily lack of focus. The lack of interest of student towards traditional teaching method is the result of the advancement of technology which created a huge distance between classical teaching procedures and technological way of life of students (Perez-Lopez, Contero, & Alcaniz, 2010)

This is where AR comes into picture. AR being introduced as a new tool for learning that gives student a more experiential way of learning. A hands-on experience is a true learning. The learning experience will be more powerful if more senses (sound, sight, touch, etc.) are involved in the learning process. AR offers this feature as it allows students to actively participate in the process of learning rather than just receiving information (Perez-Lopez, Contero, & Alcaniz, 2010). Similarly, the research done by A. Di (2012) supports the earlier point, students are more motivated to learn when the lesson was taught within AR environment compare to classical slide-based learning procedure. AR has many of advantages as it provides learners with various source of educational material that will make learning experience more realistic (Zainuddin, Zaman, & Ahamd, 2009).

There are several of AR applications being used in education nowadays. One of the most well-known AR applications especially in education is The MagicBook. MagicBook uses normal book with additional AR markers as a main interface objects. Users can still read the text, see the picture or even flip the page as usual. However, if they look at the pages through AR display they will see 3D objects appear on top of the normal page. Users are able to view the object in any angle they

wish. This is one of the advantages of AR as it introduces to users a new way of interacting with objects way never before be possible (Billinghamurst, 2002).



Figure 2.16: MagicBook

With all of its advantages, AR is technology that is expected to have more significant contribution in learning and teaching process especially in visualizing abstract concept in learning process (Zainuddi, Zaman, & Ahamd, 2009). However, the potential of AR in education remains unexplored (Serio, 2012). There are still needs to do more research on AR to explore the potential of AR towards teaching and learning process. Another challenge is how to incorporate the vast capabilities of AR in teaching and learning process. However, with the advancement in mobile technology and more of AR software available in the market, it is expected that AR will play more important role in helping to improve the classical method of teaching and learning to cope with the changes of technological way of student's life.

2.6 PROPOSED SOLUTIONS

Based on the literature reviews, one of the challenges faced by many of teachers and parents nowadays is how to retain students' attention while they are learning educational contents. Many of approaches are being used to overcome this problem which includes a Computer-based learning. A Computer-based learning can be in a form of Flash-based Learning Approach where the educational contents are integrated into a Flash-based application. Flash-based Learning Approach appears to be an interesting approach as it allows student to learn while they are playing. Flash-based Learning can be in a form of Flash-based educational games that lets student learn and play at the same time. Students will be able to memorize the educational contents better as the game will let them see and hear simultaneously.

To date, there are quite numbers of educational games available both online and off-line. This also includes several of culture teaching games. However, most of the culture teaching games are only focus on a single aspect of culture e.g. food, traditional costumes, geography, etc. There are not many of games that actually cover all aspects of culture. Moreover, most of the games are solely based on Flash application. Therefore, by adding Augmented Reality into a conventional Flash-based learning game, students will be able to memorize more of contents as they will be able to see, hear, and touch while playing game.

The design strategies that will be implemented in this game are as follows:

1. Create the game that combines both Flash application that most students are already familiar with and Augmented Reality. This will assure that student will learn the educational contents faster while they are enjoying the game.
2. Cover various aspects of cultures, e.g. food, traditional costumes, geography, etc.
3. Ensure that the educational contents of the game are well-integrated into the structure of the game as it will ensure that students are not focusing too much on the game.
4. Use of visual and auditory to help students to visualize and memorize the educational contents better at the same time they will enjoy the game.

CHAPTER 3

METHODOLOGY

3.1 SYSTEM DEVELOPEMTN METHODOLOGY

3.1.1 Methodology

After deliberately considered all relevant factors; the Throwaway Prototyping Methodology is selected for the development of this system. The Prototyping Methodology is usually used in a project when it is prone to changes as the development progress. The development cycle starts with Planning, Analysis, Design and ends with Implementation. The Planning, Analysis and Design and Implementation perform at the same time producing a design prototype at the end of each cycle. The cycle repeatedly performs according to comments given by users until it finally meets all requirements. The last prototype will then be considered as a system.

The advantage of using the Throwaway Prototyping Methodology is that it can deliver the system to users quickly despite the fact that the system may not meet all requirements agreed earlier on. However, the feedback received from users will help developers to make necessary changes that will finally produce the desired system.

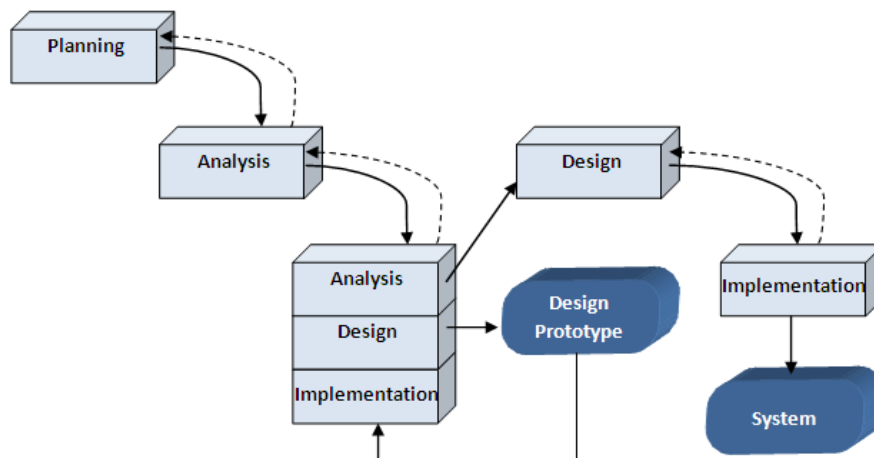


Figure 3.1: Throwaway Prototyping Methodology

3.1.1.1. **Planning**

This stage is reserved for all necessary planning that need to be done prior to development phase. Background of study needs to be done thoroughly in order to understand the problem statement behind the project better. Moreover, the feasibility study will also be conducted to see the capabilities of the project to be completed. The study will include technical feasibility, economic feasibility and organizational feasibility. The timeline for the project is also required to ensure that all processes are within time frame. With proper planning, the project can ensure to have a clear path ahead.

In this first stage, the author has carefully studied all relevant factors that lead to the problem of primary school students in learning culture. The background of study was conducted in order to identify all problems and challenges face by both teachers and parents in helping children to learn culture. Moreover, the feasibility was also conducted which covers three aspects which are technical, economic and organizational feasibility. This is to ensure that the project is feasible from technical, economic and organizational point of view.

3.1.1.2. **Analysis**

In the Analysis phase, the first task need to be done is to analyze the requirements from users which are a primary school and teachers as well as parents. Developer needs to engage with real users to understand their requirements and needs in order to plan ahead and ensure everything falls in place. User requirements plus problem statement identified earlier in planning phase will help developer to understand better about the project and be able to visualize the final output of the project.

Another important task is to gather information from published papers/journal to identify the applicable technique that can be incorporated in the project. The similar products in the market can also act as a guide or benchmark on where to start and how to improve existing product that will attract the potential users.

This is where the solutions of all problems which have been identified in planning stage will be taken place. The author has reviews several of journals, websites,

books, article and similar applications in order to understand more about the topic chosen and to identify what are the existing approaches being used to overcome those problems. By studying existing journals or applications, the author will have a better understanding of the problems and current method used in teaching culture which can lead to the solutions of the problems.

3.1.1.3. **Design**

Based on the information gathered and the to-be requirement from the analysis phase, the developer then will starts the design phase. This will be the longest phase throughout the cycle. This phase requires high involvement of users to ensure that system meet the requirements. The deliverable of this phase will be the will be the designed prototype to be use in the implementation phase.

(a) System Architecture

The design of the system architecture for ASEAN Culture Game is shown in figure 3.2. From the figure, the users i.e. the students start the communication with the system by logging in and accessing the flash application through the web-browser. Flash application will then send a request or data to the Database. To be able to use an Augmented Reality function, users are required to place the printed-market to the camera which is connected to the computer. The computer will then send the request to the Server to retrieve the data from the Database. The Server will response with requested data which in this case is the 3D model augmented over the marker live on output device.

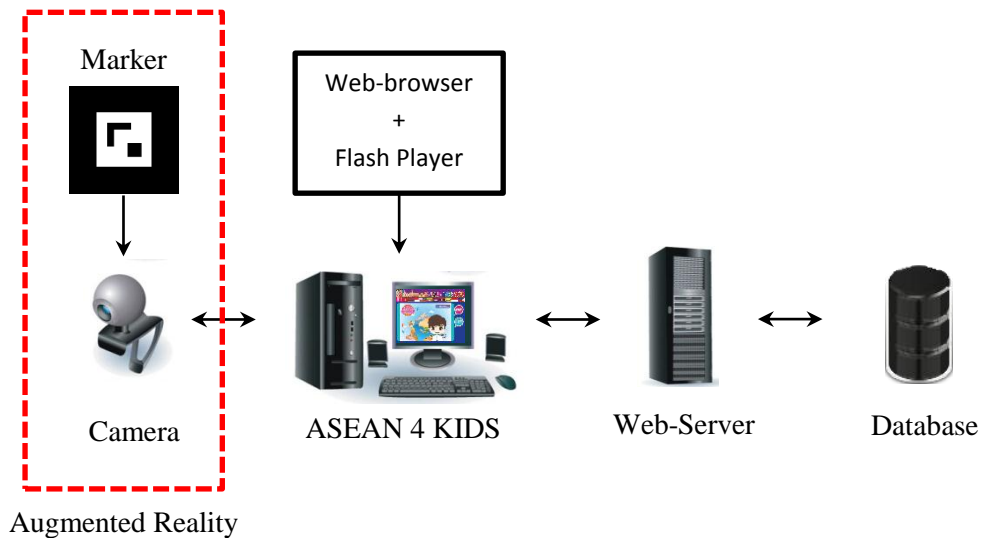


Figure 3.2: System Architecture.

(b) Activity and Use Case Diagram

After reviewing the existing similar projects and discussing with primary school teachers and parents of primary school children, the author has decided to come up with two main modules for the development of the ASEAN Culture Game shown as follows.

- Know ASEAN
- Play game

The first modules “Know ASEAN” can be subdivided into four sub topics which are:

- What is ASEAN
- History of ASEAN
- Members of ASEAN
- Future of ASEAN

Whereas in “Play game” module, a place where the students will enjoy learning the culture of ASEAN through games. This module can be further divided into three sub modules namely:

- Geography
- Food
- Local Costume

The result from the system requirement and literature review were then translated into the system models by using the Unified Modelling Language (UML) as shown in Figure 3.3 and Figure 3.4.

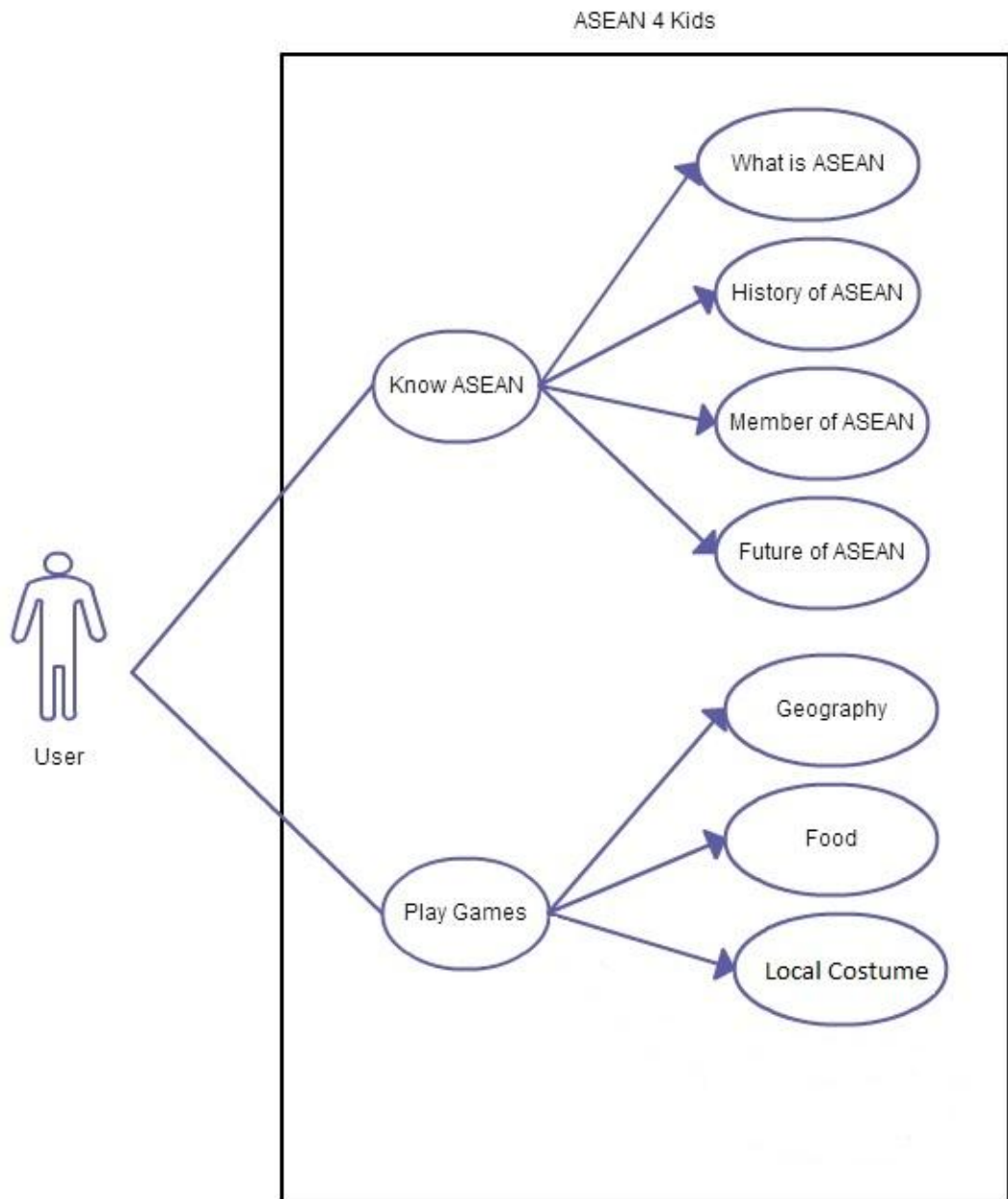
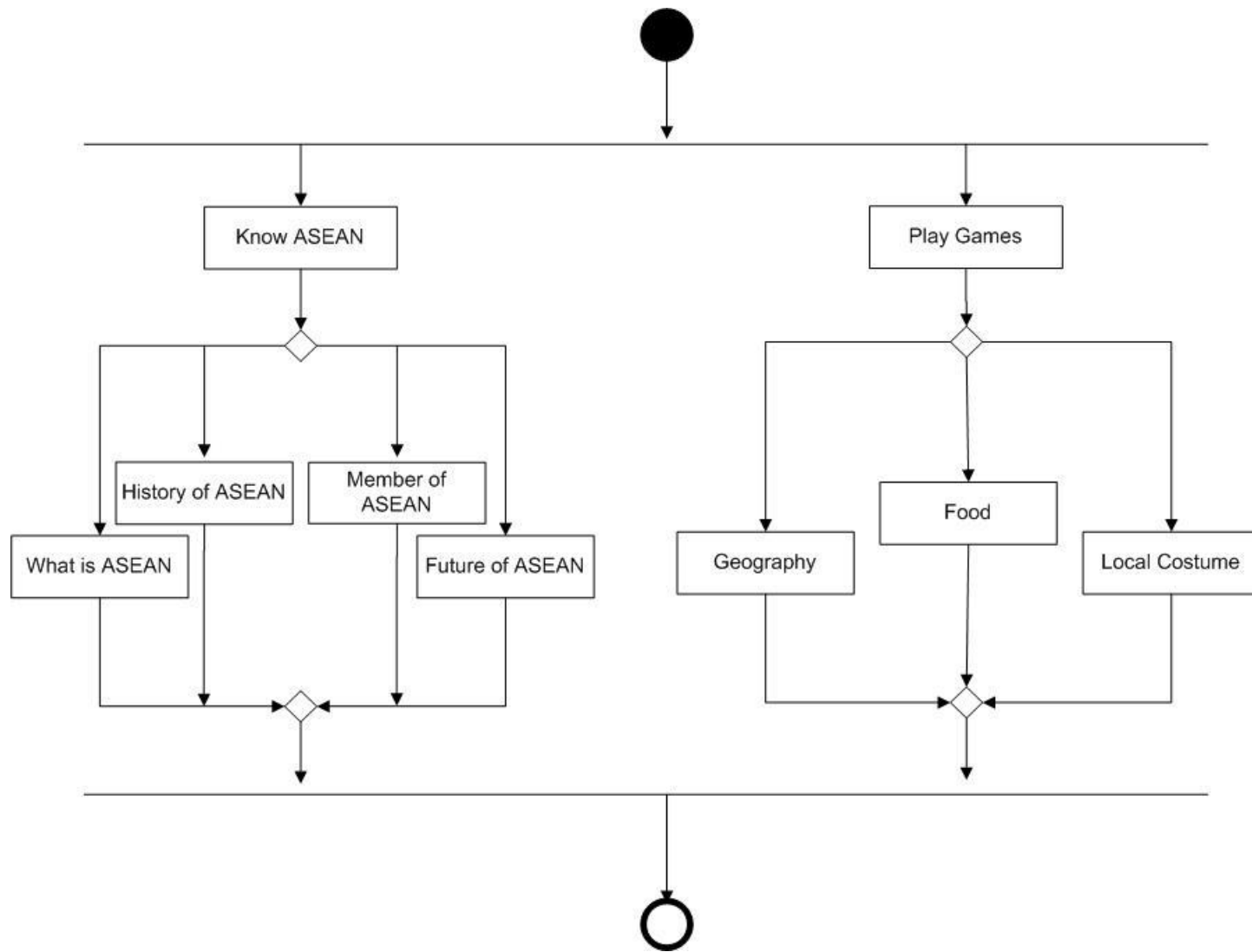


Figure 3.3 Use Case Diagram

Figure 3.4: Activity Diagram



(c) Lesson and Game design

In this project, the lesson and games are important part that requires an active participation of both parents and teachers in order to come up with a game that actually helps students in learning ASEAN Culture. Interface design is also another vital part that plays an important role in attracting students to use the game. All these issues will be discussed in detail in Chapter 4.

(d) Graphical User Interface

In the figure below, it shows some of the graphical user interface planned for the application. There was much iteration made in order to suit the system.



Figure 3.5: Early designs for the homepage screen for the ASEAN 4 Kids.



Figure 3.6: Early designs of some of the lessons of the ASEAN 4 Kids.

Besides the interface, the special design characters were also created. The pair of characters represents each members of ASEAN. Each of them will appear in an intro part of each module to interact with the users and give introductory greeting to the users so that users feel comfortable using the application.



Figure 3.7: Characters

3.1.1.4. Implementation

In this phase, the usability test will be carried out to test whether the system meets all requirement set earlier. The design prototype from Design phase will be made available to users for testing purposes. The feedbacks from all potential users which are primary school students, teachers and parents will then be analysed and taken into consideration to make necessary changes to reflect all feedbacks from users. The deliverable of this phase will be the final product that will be made available for users.

3.2 DEVELOPMENT TOOLS

Software	Hardware
<ul style="list-style-type: none">• Adobe Dreamweaver CS4• Adobe Photoshop CS4• Adobe Illustrator CS4• Adobe Flash CS4• FLARToolKit	<ul style="list-style-type: none">• Computer• Camera

CHAPTER 4

RESULT AND DISCUSSION

4.1 SYSTEM INTERFACE, LESSON AND GAME SCREENSHOTS

The interface of the system was designed by using Adobe Flash CS4, Adobe Dreamweaver CS4 and Adobe Illustrator CS4. The following figures depict the interface of the system which will be divided according to its module.

4.1.1 Homepage

Homepage will be the landing page of the system where users will be brought into after they have accessed to the system.



Figure 4.1 Homepage of the system

The character will introduce the system to the users and explain what need to be done next in order to use the system. This page allows users to choose the two main modules which are “Know ASEAN” and “Play games”. The modules are represented by the buttons with the rollover sound thus when students roll the cursor over the picture they will know what are the content of that particular module. The character will guide the user to click on the “Know ASEAN” button first in order to learn some basic about ASEAN before they can choose to play games later after they have completed the entire lesson in “Know ASEAN” module.

4.1.2 “Know ASEAN” menu page

This page lets users choose the lesson from the four lessons available. Each and every of the lesson will introduce users to different aspect of ASEAN ranging from what is ASEAN is all about until what are the future of ASEAN.



Figure 4.2 “Know ASEAN” menu page

4.1.3 What is ASEAN

This is the first lesson users will get to learn after accessed into the system. This lesson introduces users to what is ASEAN is all about. What does ASEAN stand for?, when did ASEAN founded, its motto, emblem, anthem as well as its country members.



(a)



(b)

Figure 4.3 Characters (a) and what is ASEAN lesson (b)

4.1.4 History of ASEAN

Under History of ASEAN, the page allows users to explore the timeline of ASEAN since its beginning up until ASEAN Community which will take place in 2015. The lesson was designed in a timeline basis which will give users a very simple and easy to understand history ASEAN.

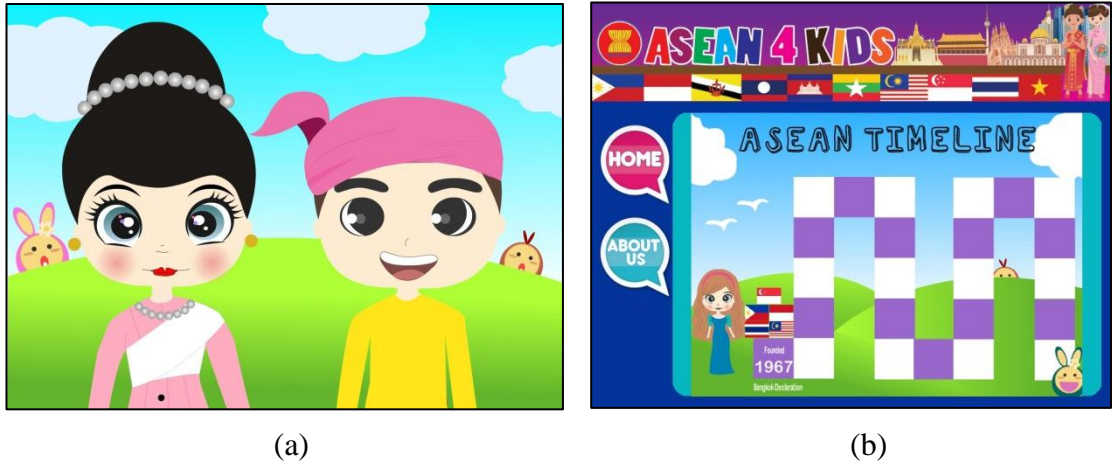


Figure 4.4 Characters (a) and ASEAN Timeline (b)

4.1.5 Member of ASEAN

This is where the users will get to learn each and every member states of ASEAN in details. The characters will introduce the users to all the ten members one by one. After which users will be brought to the page where they can choose to explore further about each country by clicking on the flag of that particular country



Figure 4.5 Characters (a) and Cambodia introductory page (b)



Figure 4.6 Member of ASEAN lesson

4.1.6 Future of ASEAN

In future of ASEAN lesson, the lesson introduces users to what will happen in ASEAN in the near future, in this case, the system focus on introducing users to ASEAN Community which will take place in 2015



(a)



(b)

Figure 4.7 Characters (a) and Future of ASEAN lesson (b)

4.1.7 “Play games” game menu page

After the users have completed the entire lesson about ASEAN, they will be guided by the character to click on “Play games” button where they will test their knowledge about ASEAN through various interactive games.



Figure 4.8 “Play games” game menu page

4.1.8 Geography game

This is a game where users will be tested the knowledge about basic geography of ASEAN. The users will be given names of countries in ASEAN which they will have to match with the given maps and flags of each member countries (refer figure 4.4).



Figure 4.9 Instruction (a) and Geography game (b)

4.1.9 Food game

Food game is a puzzle game where users have to complete the puzzle of national food of each country in ASEAN. The picture of the food comprises of name of that particular food together with the flag of the country of origin of that food. This is a place where users get to learn about food of ASEAN countries. The game allows users to learn while they are playing.

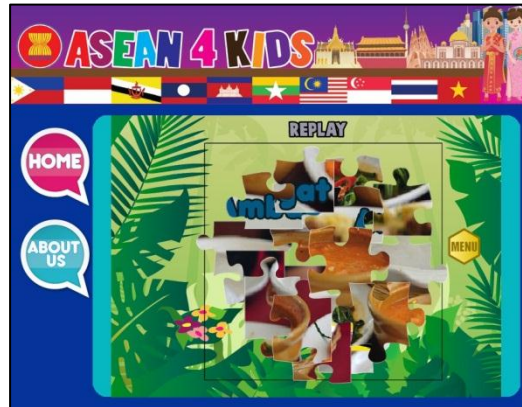


Figure 4.10 Food game

4.1.10 Local costume game

This is an augmented reality part of the application where users get to play and learn at the same time. Users will be given an AR marker which they will have to wear it on their forehead. Users have to show the marker to the camera, the marker will then display the headdress of country of ASEAN depending on which marker they wear. This game allows users to learn about the traditional costume of each member countries of ASEAN through an interactive game.



Figure 4.11 Local Costume game

4.2 EVALUATION RESULTS

The system was tested by 5 primary school students aged between nine to twelve years old under the instructions of the developer. Each child tested all the lessons and game modules with accompany by their parents and the developer.

There were two set of questionnaire distributed to each student; pre and post-questionnaire. The survey was carefully designed so that the questions are appropriate with the age and knowledge of the target respondent. The pre-survey was distributed prior to the testing session. The pre-survey contains a set of question about basic knowledge of ASEAN. The session aimed to evaluate the knowledge of the children about ASEAN prior to the testing. The results of the pre-survey will be used to compare with the post-survey later to see whether students understand more about ASEAN after using the application. After the testing session, another simple survey form was also distributed to each child. The form contains the same set of question with the pre-survey form plus another set of question regarding the feedback of the users towards the application. The post-survey aimed to be a session to collect the feedback from the children regarding the usage of the website, lesson and the game.



Figure 4.12: System Testing

As mention above, the survey is divided into two parts; part A and part B. Part A consists of five simple questions about ASEAN in general. Part B contains seven questions about the feedback of users towards the application.

In part A, the result in the bar chart depicts that in overall there are significant improvements of knowledge about ASEAN of the students after using the application. The results from the pre-survey (see figure 4.13) clearly show that knowledge about ASEAN among the students prior to the testing are very low. Only 20 percent of them or only one person that is able to recognize the flag of ASEAN. 20 per cent of them are able to identify the founding year of ASEAN. However, 3 of them or equivalent to 60 percent are able to identify the motto of ASEAN. Unfortunately, none of them do know about the total members of ASEAN. Lastly, 20 percent of them could differentiate the flag of Myanmar.

However, after the testing session, the results (figure 4.14) show that users gain more knowledge about ASEAN and able to answer most of the question. All of them could differentiate the flag of ASEAN from others. While, 4 person or 80 percent of them are able to recognize the founding year of ASEAN. 100 percent of them are able to identify the motto of ASEAN and total numbers of ASEAN members. However, only four of them got it right about the flag of Myanmar.

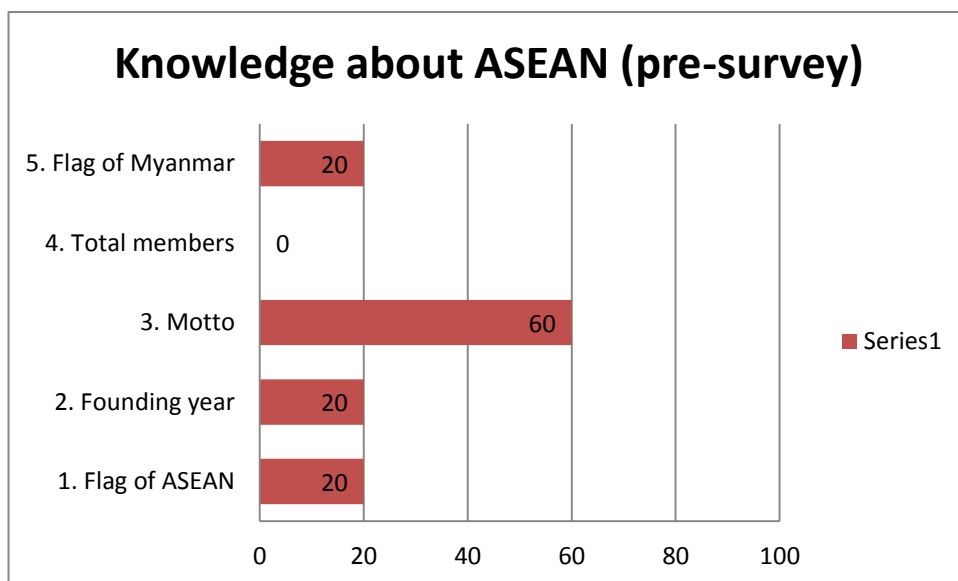


Figure 4.13 Knowledge about ASEAN (pre-survey)

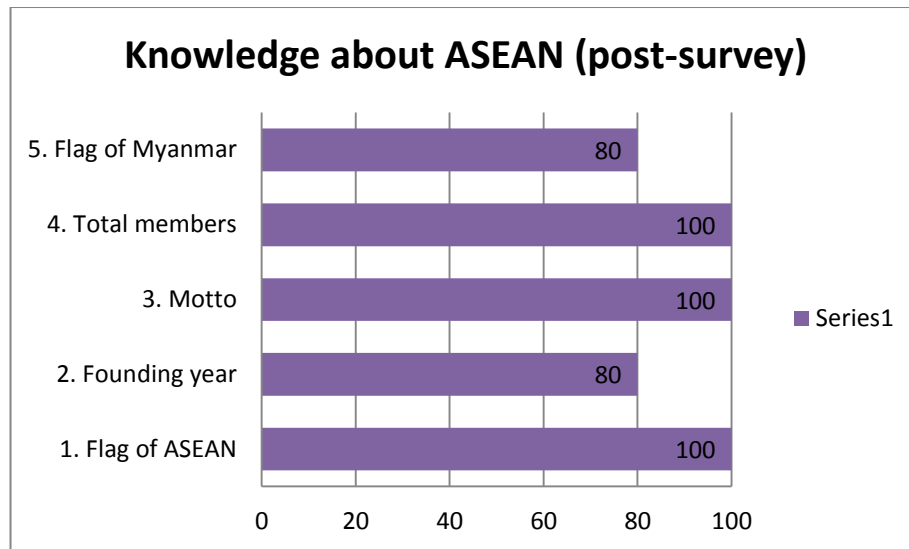


Figure 4.14 Knowledge about ASEAN (post-survey)

From the result of the survey, it can be said that “ASEAN 4 Kids” has helped students to learn more about ASEAN. There are significant improvements in terms of general knowledge about ASEAN among the users.

In part B, the results show that users are satisfied with the prototype and find it interesting to use. It also shows that learning culture can be fun and game is another approach to help in learning culture. The bar graph below shows the score of each question:

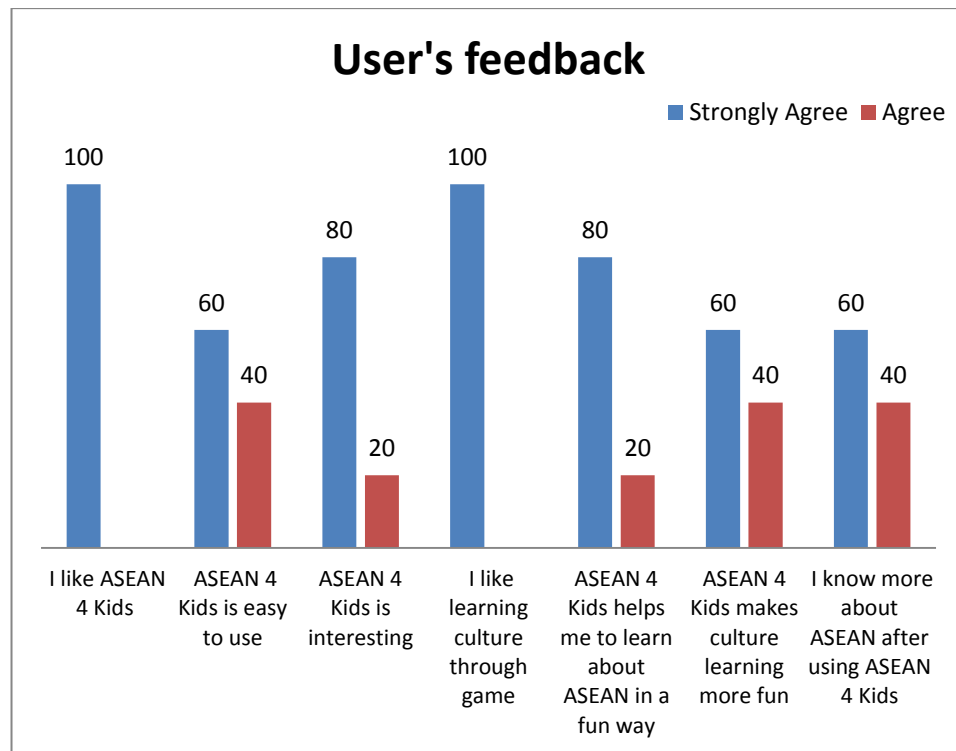


Figure 4.15 Users' feedback for the system testing

The questions and analysis are as followed:

1. I like ASEAN 4 Kids.
All students strongly agree with the statement. This can be concluded that all of the respondents like the system and would really love to use it.
2. ASEAN 4 Kids is easy to use.
60 percent of the respondents strongly agree that ASEAN 4 Kids is easy to use while another 40 percent agree with the statement. It can be said that ASEAN 4 Kids is user-friendly and definitely easy to use even for a first time user.
3. ASEAN 4 Kids is interesting.
Majority of the respondent which covers 80 percent of them strongly agree that the application is interesting. The remaining also agrees with the statement. Hence, it can be said that users find the application interesting.

4. I like learning culture through game
The entire respondents strongly agree that they love to learn culture through game. Game can be in various forms, Flash-based game is another interesting approach to be used in teaching culture. From the result, it shows that students enjoy learning culture through game; hence, there are huge opportunities for game-based learning in teaching culture.
5. ASEAN 4 Kids helps me to learn about ASEAN in a fun way.
Learning history can be very boring, but not to ASEAN 4 Kids. 80 of the respondents strongly agree that the application helps them to learn about ASEAN in a more fun way.
6. ASEAN 4 Kids makes culture learning more fun.
60 percent of the respondents strongly agree that ASEAN 4 Kids makes culture learning more fun, while the remaining 40 percent agree with the statement. This clearly shows that culture learning can be fun with the help of ICT.
7. I know more about ASEAN after using ASEAN 4 Kids.
All of the respondent agree with the statement, 60 percent of them strongly support the sentence while another 40 percent agree with it. This shows that culture learning can be fun and interactive. It also helps the students to learn the contents while they are playing with the application.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

Culture learning has often been associated as a boring and non-attractive learning process especially to young children. However, as technology has risen, it has made culture learning more interactive and interesting through the use of ICT. This includes Flash technology, many studies show the benefits of using Flash technology including attracting children attention better than some traditional method, engaging children to learn by doing and visualizing, eliciting social interaction and most importantly it is proved that it helps in developing the knowledge about culture in children.

“ASEAN 4 Kids” was developed to cater the need of an interactive application for learning ASEAN culture. The application aimed to raise awareness and understanding of ASEAN, its people and cultures to young children through ICT. The prototype system was tested with 5 primary school children aged between nine to twelve years old under the instruction of the developer and parents. The results of the study are shown below:

1. Knowledge of students about ASEAN has improved after using the application
2. The students find “ASEAN for kids” interesting and easy to use.
3. The application has helped the student in learning ASEAN culture in a more fun and interactive way.
4. Game-based approach possesses possibility in improving student engagement in culture learning.

The result in overall showed the excitement of the children towards the system which is a good sign for the implementation in the real learning environment later on.

In conclusion, this project will be benefited to children in assisting their learning of ASEAN and culture of each ASEAN members. Moreover, it will also help in raising awareness and understanding of ASEAN among young generation.

5.2 RECOMMENDATIONS

For future improvement of the system, there are several recommendation made by the parents and the examiners which are following functions;

- (1.)To add more language than English i.e. Thai, Vietnamese, Bahasa Indonesia.
- (2.)To expand the scope for different ages.
- (3.)To have more interaction in the mini-lesson.
- (4.)To add more games and include more variety of game type.
- (5.)To explore possibility of expanding the application to other platform i.e. mobile device in order to reach out to more audience.

REFERENCES

- ASEAN Secretariat. (1992). Retrieved October 25, 2012, from The official website of the Association of Southeast Asian Nations:<http://www.aseansec.org/20024.htm>
- Austria, M. S. (2001). "Moving Towards an ASEAN Economic Community", Springer Science+Business Media B.V.
- Azuma, R., Bailiot, Y., Behringer, R., Feiner, S., Julier, Julier., & MacIntyre, B. (2001). "Recent Advances in Augmented Reality", IEEE Computer Graphics and Applications, 34-47.
- Azuma, R. (2001). "A Survey of Augmented Reality", Teleoperators and Virtual Environments 6, 4 (August 1997), 355-385.
- Billinghurst, M. (2002). Augmented Reality in Education. December 2002 New Horizons for Learning. Available at <http://www.newhorizons.org>
- Downes, T. Arthur, L., & Beecher, B. (2001). Effective learning environments for young children using digital resources: An Australian perspective. In Information Technology in Childhood Education Annual, 1,139-153. Norfolk, VA: AACE.
- Fisch, S. H. (2005). "Making Educational Computer Games Educational", IDC.
- Guerrero, R. B. (2010). "Regional integration: the ASEAN vision in 2020", IFC Bulletin No 32.
- Flintoff, JP. (2002). "Children get smart with their computer games: shooting baddies may help the development of academic skills", Financial Times.
- Garner, R., Brown, R., Sanders, S., & Menke, D.J "Seductive details" and learning from text. In K.A. Renninger, S. Hidi, & A. Krapp (eds.), The role of interest in learning and development (pp. 239-254). Lawrence Erlbaum Associates, Mahwah, NJ, 1992
- Go, C. A. L., & Lee, W. H. (2007). "Digital Game-Based Learning: An Agent Approach", Springer-Verlag Berlin Heidelberg.

- Institute of Southeast Asian Studies. (2010). Know your ASEAN. Singapore: ISEAS Publishing.
- Green, B., Reed, J., and Bium, C. Teaching the Nintendo Generation? Children, computer culture, and popular technologies. In S. Howard(ed.). *Wired UP*. Page. 19-42. UCLPress: London,1998.
- Keller, J.M. Motivational design of instruction. In C.M. Reigeluth (Ed.), *Instructional design theories and models: an overview of their current status*. Hillsdale, NJ ; Lawrence Erlbaum,384-434,1983.
- Kesim, M., & Ozarslan, Y. (2012). “Augmented reality in education: current technologies and the potential for education”, *Procedia – Social and Behavioral Science* 47, page 297 – 302.
- Lamb, A., & Johnson, L. (2006). “Flash: engaging learners through animation, interaction and multimedia”. *Teacher Librarian* 33 Vol.4, 54-56.
- Lin, K. C and Wei, Y. C. *Online Interactive Game-Based Learning in High School History Education: Impact on Educational Effectiveness and Student Motivation*, National Chung Hsing University, 2011
- Martin-Gutierrez, J., Saorin, J. L., Contero, M., & Alcaniz, M. (2009). “Design and validation of an augmented book for spatial abilities development in engineering students”, *Computers & Graphics*
- Mayer, R. E., & Moreno, R. (2002). “Animation as an Aid to Multimedia Learning”, *Educational Psychology Review*, Vol. 14, No. 1.
- Mitchell, A., and Savill-Smith, C.. *The use of computer and video games for learning: A review of the literature*. London, UK: Learning and Skills Development Agency,2004
- Munn, N. L., Femald Dodge, L., and Femald, D. S. *Introduction to psychology*. Boston: Houghton Mifflin Co,1969.
- Neo, M., & Neo, K. T. K. (2001). “Innovative teaching: Using Multimedia in a problem-based learning environment”. *Educational Technology & Society* 4

- Oh, S., & Woo, W. (2008). "ARGarden: Augmented Edutainment System with a Learning Comparison", Springer-Verlag Berlin Heidelberg.
- Omar, R., Jan, J. M., Abd Hamid, H. & Mat Akhir, A. (2009). The Humanities in ASEAN Studies and Higher Education – Teaching of ASEAN History in Higher Education. Paper presented at the Conference on the Humanities 2009, Malaysia.
- Pasadilla, G.O. (2004), East Asian Co-operation: The ASEAN View, Philippine Institute for Development Studies, Discussion Paper Series, No. 2004- 27, August 2004.
- Perez-Lopez. D., Contereo, M., Alcaniz, M. (2010). Collaborative Development of an Augmented Reality Application for Digestive and Circulatory System Teaching. Paper presented at the 10th IEEE International Conference on Advanced Learning Technologies.
- Prensky, M.: Digital Game-Based Learning. McGraw-Hill, New York (2001)
- Prensky, M. Digital game-based learning. Computers in Entertainment, 1(1), 21-21,2003.
- Reilly, W. J. A manual for the use of the motivated strategies for learning questionnaire (MSLQ). MI:Ann Arbor. 1983.
- Rodolfo, C. S. Jr. (2002). ASEAN Today and Tomorrow, PT Maksimedia Satyamitra.
- Saluveer, E., (2004). Teaching Culture in English Classes. Department of English, University of Tartu, Estonia.
- Serio, A. D., Ibanez, M. B., & Kloos, C. D. (2012). "Impact of an augmented reality system on students' motivation for a visual art course", Computer & Education.
- Seelye, H. N. 1993. Teaching culture: Strategies for inter- cultural communication . 3rd edition. Lincolnwood, IL: National Textbook Company.
- Stern, H. H. 1992. Issues and Options in Language Teaching. Oxford: Oxford University Press.
- Tepperman, L., Curtis, J., Wilson, S. J. and Wain, A. 1994. Small World. International Readings in Sociology. Ontario: Prentice Hall Canada INC.

The Association of Southeast Asian Nations, Charter of the Association of Southeast Asian Nations, October 20, 2007, available at: <http://www.aseansec.org/64.htm> [accessed 26 October 2012]

Thompson, E. C., & Thiantahai, C. (2008). "Attitudes and Awareness towards ASEAN : Finding of a Ten-Nation Survey", ISEAS Publishing.

Wang, H., Tsai, S., Chou, C., Hung, H. The study of motivation and reasoning faculties of Game-based Learning in Elementary school students, 2010 2nd international Conference on Education Technology and Computer (ICETC), 2010

Verenikina, I., & Herrington, J. (2008). "The affordances of computer play in young children: A preliminary study" University of Wollongong.

Zainuddin, N. M M., Zaman, H. B., & Ahmad, A. (2009), "Learning Science Using AR Book: A Preliminary Study on Visual Needs of Deaf Learners", Springer-Verlag Berlin Heidelberg.

Zhang, H. Y. (2009). An educational Flash game for pre-school children. Paper presented at the the 1st International Conference on Information Science and Engineering (ICISE2009).

Appendices

Appendix A: Questionnaire

QUESTIONNAIRE

What you say about ASEAN 4 Kids will help us to improve ASEAN 4 Kids

Please complete your details:

1. Gender:



2. Age:

9

10

11

12

2. Year of study:

Standard 4

Standard 5

Standard 6

Part A: Knowledge about ASEAN (Pre/Post-questionnaire)

Circle the correct answer; if you are not sure, give your BEST GUESS

1. Which of the following is the flag of ASEAN?



2. What year was ASEAN founded?

a. 1947

b. 1957

c. 1967

d. 1977

e. 1987

3. What is the motto of ASEAN?

a. Peace and Security

b. One vision, One identity, One community

4. How many countries are the members of ASEAN?

a. 8

b. 9

c. 10

d. 11

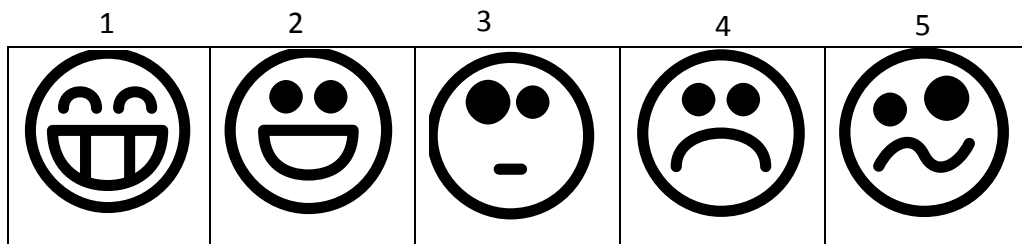
e. 12

5. Which of the following is the flag of Myanmar?



All questions below are coded so that...

- | | | |
|----------------------------|---|---------------------------|
| Strongly Agree | 1 | Very happy face |
| Agree | 2 | Happy face |
| Neither Agree nor Disagree | 3 | Neither happy nor unhappy |
| Disagree | 4 | Unhappy faces |
| Strongly Disagree | 5 | Very unhappy face |



Please tick the box according to your preference (tick one box only):

1. I like ASEAN 4 Kids.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. ASEAN 4 Kids is easy to use.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. ASEAN 4 Kids is interesting.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. I like learning culture through game	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. ASEAN 4 Kids helps me to learn about ASEAN in a fun way.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. ASEAN 4 Kids makes culture learning more fun.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. I know more about ASEAN after using ASEAN 4 Kids.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Thank you for helping us by filling in this form

Appendix B: Project's Key Milestones

Key Milestone	Week
Project Proposal	Week 3
Extended Proposal (10%)	Week 6
Proposal Defense (40%)	Week 9
Interim Report (50%)	Week 11

Table 1: FYP1 Milestone

Key Milestone	Week
Progress Report (10%)	Week 7
Pre-SEDEX (10%)	Week 10
Dissertation (40%)	Week 12
VIVA (30%)	Week 13
Technical Report (10%)	Week 14

Table 2: FYP2 Milestone

Appendix C: Project's Gantt Chart

Final Year Project 1

Activities/Week	1	2	3	4	5	6	7	8	9	10	11	12
Selection of Project Topic & Supervisor												
Submission of Proposal												
Extended Proposal Progress												
Research Activities												
Submission of Viva: Proposal defense and Progress Evaluation												
Interim Report Progress												

Table 3: Final Year Project 1 Gantt chart

Final Year Project 2

Activities/Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Programming Research														
Prototype Development														
Submission of Progress Report I														
Submission of Progress Report II														
Seminar														
Pre-SEDEX														
Submission of Final Report Draft														
SEDEX														
Oral Presentation														
Submission of Final Dissertation														

Table 4: Final Year Project 2 Gantt chart

ASEAN 4 KIDS: AN INTERACTIVE APPLICATION FOR LEARNING ASEAN CULTURE

Aris Chema

Department of Computer & Information Sciences

Universiti Teknologi PETRONAS,

Bandar Seri Iskandar, 31750 Tronoh,

Perak, Malaysia.

domon1989@gmail.com

Abstract — with three years to the implementation of ASEAN Community in 2015, knowledge about ASEAN is the basic fundamental building block to the success of the ASEAN Community. A research has revealed that currently there is still a significant knowledge gap about ASEAN among young generation. Therefore, this project aims to fulfil this gap by designing and developing an interactive application for learning ASEAN culture named “ASEAN 4 KIDS”. Objective of this project are to develop an interactive application that encourages young children especially primary school students to learn some basic knowledge about ASEAN and culture of each member countries. The project also aims to raise awareness and understanding of ASEAN, its people and cultures to primary school students through ICT. Additionally, the objectives are to explore the use of game-based approach in promoting culture learning as well as to evaluate the effectiveness of the application in learning ASEAN culture. Currently in the market, there are limited numbers of culture teaching applications that integrate various aspects of culture. Furthermore, the products that actually focus on teaching ASEAN Culture are very scarce. Using Flash and Augmented Reality, the system exposes the young children to the technology while they learn from the animation lessons and play the interactive games which are the mechanism to teach about ASEAN and deliver the educational content. Besides, the proposed system, this project also involves the study of how culture is being taught in school and the study of young children nature. As a result, the lessons and games are age-appropriate and match the abilities of the children. As a consequence the system is not only creating a joyful learning for the children but also help create awareness and understanding about ASEAN among them. The prototype system is tested with 5 primary school children aged between nine to twelve years old under the instruction of the developer and parents. The result of the testing showed the excitement of the children towards the system which is a good sign for the implementation in the real learning environment later on.

I. INTRODUCTION

A. Background Study

This year ASEAN celebrates its 45th year anniversary with more than a total of 500 million populations with a combined

gross domestic product of with a gross domestic product equal to China’s (Rodolfo, 2002) ASEAN is now on its journey towards becoming an ASEAN Community and a Zone of Peace, Freedom and Prosperity.

As the ASEAN Community get closer each day. Sooner or later, ASEAN will become part of people’s daily life, for example in trading, education, working, travelling, and other regional cooperation. Thus, it is important to create the awareness and basic understanding of the ASEAN Community and the association to the people especially to young children as they are the future generation that will one day become the leaders and help in developing the region as well as improving the betterment of people in the region. However, knowledge about the ASEAN Community and the association are still poorly integrated in today’s learning of young children. This research is aimed to fulfil this gap.

B. Problem Statements

- There is significant knowledge gap about ASEAN among young generation.
- Students are lack of motivation in learning due to the ineffective of a traditionally teacher-centered instruction and text-based learning.
- Limited number of culture teaching applications that integrate various aspects of culture.
- Very few existing application in the market that focuses on teaching ASEAN Culture

C. Objectives

The objectives of this project are:

- To raise awareness and understanding of ASEAN, its people and cultures to primary school students through ICT.
- To design and develop a web-based interactive application that encourages primary school students

to learn some basic knowledge about ASEAN and culture of each member countries.

- To explore the use of game-based approach in promoting culture learning.
- To evaluate the effectiveness of the application in learning ASEAN culture.

II. LITERATURE REVIEW

A. *Why is ASEAN Community Important?*

With the ASEAN community coming into effect in 2015, it is important to all of us as a citizen of ASEAN to understand the basic idea of ASEAN Community as well as how does it going to affect our daily life. ASEAN Community is an idea whereby all countries members of ASEAN will come forward to form a regional community founded on three different pillars namely an ASEAN Socio-cultural Community (ASCC), an ASEAN Security Community (ASC) and an ASEAN Economic Community (AEC) (ASEAN Secretariat, 1992).

The ASSC aims to create a community that members are bonded together and live in a caring society whereas the goal of ASC is to bring peace to the region by ensuring that each member lives harmoniously and peacefully with each other as well as the world at large. The AEC is to increase the overall competitiveness of the region and to further improve economic cooperation among member states. AEC will transform ASEAN into a region with single market and production base with free flow of goods, services, capital and skill labours. (Guerrero, 2010)

Each of the three pillars will definitely affect citizen of ASEAN in one way or another. From economic point of view, ASEAN community which will transform the region into a single market will definitely bring about drastic changes to the region. Generally, single market will create a more competitive environment whereby each member states will face more competition from outside. This will somehow subsequently reduce the overall cost of goods and services in the region. Many of trade barriers will be removed resulting in more of employment opportunities for the people. This factor will help in improving the standard of living of the people as well as reduction in the numbers of poverty. Free flow of labour will cause an influx of labour from neighboring member states. Thus, it is important for all local labours to prepare themselves in such a way that they will be able to compete with foreign workers. Several of opportunities as well as threat can still be seen from the establishment of ASEAN Community. With only three years to go, there is an urgent need for intense communication, socialization and dialogue on the ASEAN Community. It is responsible for both local government and the people to start realizing the importance of ASEAN Community and how it will affect them. Knowledge about the region and neighboring countries are among the basic factor that can contribute to the success of business. Business will not be able to compete with other countries if they fail to understand their culture, language, norm, politics, etc. Hence, there is a need to educate people of ASEAN about the association as well as their neighboring countries.

B. *Understanding what is motivation*

Motivation is one of the main factors in determining how successful the learning is. Many of researchers have given the

definition of what is motivation. Munn et al. defined that motivation, as a sort of intrinsic power such as interest, attitude and desire, can influence personal behavior (Munn, Dodge & Femald, 1969). On the other hand, Keller regarded motivation as people's choice of experiences and goal, and how they make efforts to achieve them (Keller, 1983). Besides, Reilly, Lewis & Tanner considered motivation to be the power inside oneself (Reilly, 1983). Hence motivation can be regarded as the process that initiates, guides and maintains goal-oriented behaviors. Motivation is what causes us to act, whether it is getting a glass of water to reduce thirst or reading a book to gain knowledge.

C. *Game based learning.*

Technology is growing rapidly over a year; it has made huge differences in how people live nowadays. It is inevitable that technology has influence people's life in one way or another. The use of technology is no longer restricted among technology geek but has widespread to people at all age including young children. Most of parents nowadays are eager to let their children exploring new technology where children can learn and play at the same time (Verenikina & Herrington, 2008).

Technology has now become part of most people's life. It has penetrated into various parts of society resulting in huge difference in how people live. Education has also adopted technology to be part of learning and teaching process. The use of technology in education has made a big impact in how children learn. Games are among technological tools being used as a medium in children's learning activity. The use of games in learning has actually changed so much in how our brain works. The widespread use of video games in society has actually re-wired our brain which causes the traditional learning method to be less effective (Prensky, 2001)

There are several of studies that support the ideas of incorporating game into a learning process. Flintoff (2002) states in his study that games are actually enhancing students' memory capacity, at the same time it also help to retain student attention and help them in the process of problem solving strategies which can indirectly improve their academic performances. Another study has revealed that games are not only motivating children but can also help in engaging and learning a serious academic contents (Garner, Brown, Sanders, & Menke, 1992).

However, there are many concerns among educators in terms of how games can be applied to education, and how to design and development educational games that can really help student in learning process. To take full advantages of using games a medium in learning, the creators of the games must ensure that the educational contents of the game are well-integrated into the structure of the game (Shalom, 2010). Research has also suggested that the games will be effective when it is designed in a pedagogical manner suitable for young children, in a manner that will allow them to explore, solve problem, look things up, and do activities which promote communication, interaction, discovery and problem solving (Downes, Arthur, & Beecher, 2001)

Currently, there are many of educational games available in the market both online and off-line. The games are available in various genres. However, there are not many games that actually incorporate Flash and Augmented Reality together. Most of the educational games available in the market are

mostly based solely on Flash. Moreover, the contents of most of games are much similar for example, learning alphabet, numbers, language, etc.

D. Motivation and game based learning

Sustaining students' attention while learning is among one of the top challenges faced by many of today's educators nowadays. Successful learning requires motivation (Prensky, 2003). Motivation is a very important factor for primary school students in learning. Primary school student which by nature has very poor attention towards learning, this in a way leads to a lack of motivation in learning. Nowadays, traditionally teacher-centered didactic instruction is progressively substituted by student-centered various interactive learning patterns (Prensky, 2001). Using computer games is one of the very effective ways to increase students' learning motivation as it takes both entertainment and education into consideration. According to Prensky, game based learning will be the main learning pattern in the 21st century; the traditional learning style such as emphasizing reading and writing is going to be replaced. Several of studies has support the use of game based learning in education, a series of studies show that e-learning which includes game based learning are not only triggers users' intrinsic motivation, but also arouses peer cooperation and coordination (). Therefore, game based learning can play a very important role in learning of primary school students as it helps to improve students' motivation towards learning by allowing them to learn through game.

However, many problems arose in game based learning, game based learning can enhance student's motivation except when students are focusing too much on playing games instead of learning itself.(Kuan, 2001) Children and adults are often attracted by the entertaining sound and light effects in multi-media games. Students' learning motivation must be maintained so that teaching activities could move on (Reod and Bium, 1998). In Mitchell and Savill's study, if game based learning turns into game addiction, game type learning will brings down learner's motivation. This is where teacher play a role in assisting learning of student and ensure that their motivation is being maintained. Thus game based learning will be a very effective tool in enhancing student's motivation in leaning, however, the teachers must ensure that students are not focusing too much on the game instead of the educational contents and guarantee the their motivation is being maintained.

E. Flash-based Learning Approach

Retaining student's attention in class is a big challenge faced by most of primary school teachers. This is due to psychological characters of young children that have poor attention and somehow will not last long (Ye & Cai, 2012). Currently there are quite a number of approaches being used to overcome this problem. Among those is the use of multimedia in education. A research has shown that multimedia instructional environments are proved to have a strong potential to improve the way people learn (Mayer, 1999). Therefore, multimedia has a big role to play in enhancing the learning methods that will help to retain student's attention in class.

Research indicates that student can memorize only 20 percent of the content they learn, an increment to 40 percent if

they could see and hear. In fact, people are capable of memorizing the contents up to 75 percent if they see and hear simultaneously (Neo & Neo, 2001,). This is where Flash application comes into picture as it allows students to see and hear at the same time while they are learning.

Flash application is a well-known authoring environment for creating animation and multimedia. Flash is a first choice for educational software developers as it excels in many aspects such as image design, animation creation, and interaction implementation. A result from the study has shown that flash-based application can have a great impact in helping students to learn, strengthen motivation and extend duration of student's attention towards the lesson (Ye & Cai, 2012). Therefore, flash-based educational application has a strong potential in enhancing a classical learning methods that will promote a learning environment that allows student to fully utilize their skills.

F. What is Augmented Reality?

The clear definition of Augmented Reality (AR) is still ambiguous among researchers despite its long existence. The clear and most cited definition of AR was given by Azuma in 1996; he stated that AR is a variation of Virtual Reality (VR). VR create the environment where the user can interact with the virtual world in real time. However the users will be completely immerse inside a synthetic environment. While immersed, the user cannot see the real world around him (Azuma, 1996). Whereas in AR environment, the user does not fully immerse inside virtual world, users can still able to see the real world at the same time as virtual object attached to real locations and objects (Billinghurst, 2002). Three characteristics of AR had been identified by Azuma which are rendering the virtual and real object together, interaction in real time and registration in 3D.

G. Augmented Reality in education

In learning environment, students' motivation and engagement in learning is important. As stated by many researchers, students who are motivated to learn are more likely to succeed in education and pose more chances to complete the given tasks than those who are not motivated (Csikszentmihalyi, 1991; Efklides, Kuhl, & Sorrentino, 2001; Keller, 1979; Schmidt, 2007). Hence it is important to create the learning environment and activities which motivate and encourage the students to take part in the activities. In today's learning class, the current research showed that many students are still lack of interest in learning and less motivation (Perez-Lopez, Contero, & Alcaniz, 2010). The traditional teaching method through the use of book based learning and teacher giving the lecture in front of the class make the students become easily lack of focus. The lack of interest of student towards traditional teaching method is the result of the advancement of technology which created a huge distance between classical teaching procedures and technological way of life of students (Perez-Lopez, Contero, & Alcaniz, 2010)

This is where AR comes into picture. AR being introduced as a new tool for learning that gives student a more experiential way of learning. A hands-on experience is a true learning. The learning experience will be more powerful if more senses (sound, sight, touch, etc.) are involved in the learning process. AR offers this feature as it allows students to actively participate in the process of learning rather than just

receiving information (Perez-Lopez, Contero, & Alcaniz, 2010). Similarly, the research done by A. Di (2012) supports the earlier point, students are more motivated to learn when the lesson was taught within AR environment compare to classical slide-based learning procedure. AR has many of advantages as it provides learners with various source of educational material that will make learning experience more realistic (Zainuddin, Zaman, & Ahamd, 2009).

There are several of AR applications being used in education nowadays. One of the most well-known AR applications especially in education is The MagicBook. MagicBook uses normal book with additional AR markers as a main interface objects. Users can still read the text, see the picture or even flip the page as usual. However, if they look at the pages through AR display they will see 3D objects appear on top of the normal page. Users are able to view the object in any angle they wish. This is one of the advantages of AR as it introduces to users a new way of interacting with objects way never before be possible (Billinghurst, 2002).

With all of its advantages, AR is technology that is expected to have more significant contribution in learning and teaching process especially in visualizing abstract concept in learning process (Zainuddi, Zaman, & Ahamd, 2009). However, the potential of AR in education remains unexplored (Serio, 2012). There are still needs to do more research on AR to explore the potential of AR towards teaching and learning process. Another challenge is how to incorporate the vast capabilities of AR in teaching and learning process. However, with the advancement in mobile technology and more of AR software available in the market, it is expected that AR will play more important role in helping to improve the classical method of teaching and learning to cope with the changes of technological way of student's life.

III. METHODOLOGY

A. Methodology

The Throwing Prototyping Methodology is selected for the development of this system. The Prototyping Methodology is usually used in a project when it is prone to changes as the development progress. The development cycle starts with Planning, Analysis, Design and ends with Implementation. The Planning, Analysis and Design and Implementation perform at the same time producing a design prototype at the end of each cycle. The cycle repeatedly performs according to comments given by users until it finally meets all requirements. The last prototype will then be considered as a system.

The advantage of using the Throwing Prototyping Methodology is that it can deliver the system to users quickly despite the fact that the system may not meet all requirements agreed earlier on. However, the feedback received from users will help developers to make necessary changes that will finally produce the desired system.

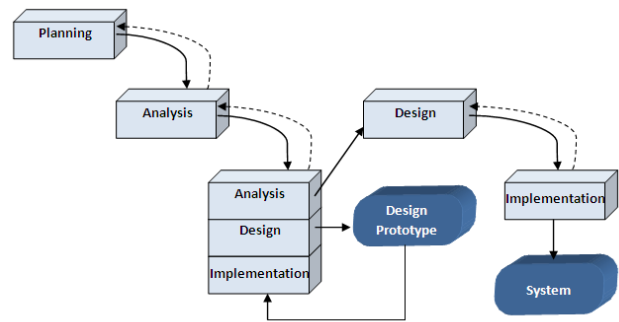


Figure 1: Throwing Prototyping Methodology

B. System Architecture

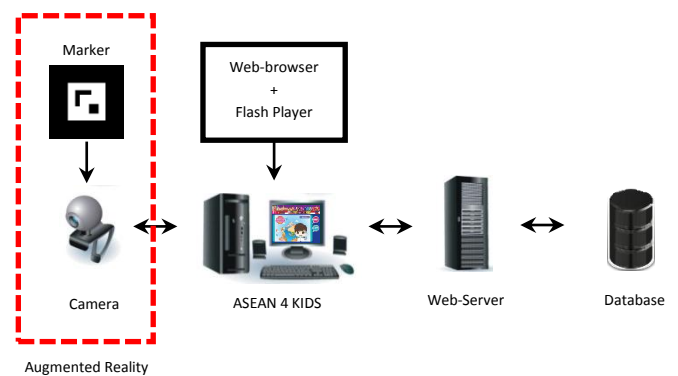


Figure 2: System Architecture

C. Graphical User Interface

In the figure below, it shows some of the graphical user interface planned for the application. There was much iteration made in order to suit the system.



Figure 3: Early designs for the homepage screen for the ASEAN 4 Kids.



Figure 4: Early designs of some of the lessons of the ASEAN 4 Kids.

Besides the interface, the special design characters were also created. The pair of characters represents each members of ASEAN. Each of them will appear in an intro part of each

module to interact with the users and give introductory greeting to the users so that users feel comfortable using the application.



Figure 5: Characters

Tools that have been opted for this project are Adobe Dreamweaver CS4, Adobe Photoshop CS4, Adobe Illustrator CS4, Adobe Flash CS4, FLARToolKit and Format Factory.

IV. RESULTS AND DISCUSSIONS

A. System Interface, Lesson and Game Screenshots

The interface of the system was designed by using Adobe Flash CS4, Adobe Dreamweaver CS4 and Adobe Illustrator CS4. The following figures depict the interface of the system which will be divided according to its module.

Homepage

Homepage will be the landing page of the system where users will be brought into after they have accessed to the system.



Figure 6: Homepage of the system

The character will introduce the system to the users and explain what need to be done next in order to use the system. This page allows users to choose the two main modules which are “Know ASEAN” and “Play games”. The modules are represented by the buttons with the rollover sound thus when students roll the cursor over the picture they will know what are the content of that particular module. The character will guide the user to click on the “Know ASEAN” button first in order to learn some basic about ASEAN before they can choose to play games later after they have completed the entire lesson in “Know ASEAN” module.

“Know ASEAN” menu page

This page lets users choose the lesson from the four lessons available. Each and every of the lesson will introduce users to different aspect of ASEAN ranging from what is ASEAN is all about until what are the future of ASEAN.



Figure 7: “Know ASEAN” menu page

What is ASEAN

This is the first lesson users will get to learn after accessed into the system. This lesson introduces users to what is ASEAN is all about. What does ASEAN stand for?, when did ASEAN founded, its motto, emblem, anthem as well as its country members.



(a) (b)

Figure 8: Characters (a) and what is ASEAN lesson (b)

History of ASEAN

Under History of ASEAN, the page allows users to explore the timeline of ASEAN since its beginning up until ASEAN Community which will take place in 2015. The lesson was designed in a timeline basis which will give users a very simple and easy to understand history ASEAN.



(a) (b)

Figure 9: Characters (a) and ASEAN Timeline (b)

Member of ASEAN

This is where the users will get to learn each and every member states of ASEAN in details. The characters will introduce the users to all the ten members one by one. After which users will be brought to the page where they can choose to explore further about each country by clicking on the flag of that particular country



(a) (b)

Figure 10: Characters (a) and Cambodia introductory page (b)



Figure 11: Member of ASEAN lesson

Future of ASEAN

In future of ASEAN lesson, the lesson introduces users to what will happen in ASEAN in the near future, in this case, the system focus on introducing users to ASEAN Community which will take place in 2015



(a) (b)

Figure 12: Characters (a) and Future of ASEAN lesson (b)

“Play games” game menu page

After the users have completed the entire lesson about ASEAN, they will be guided by the character to click on “Play games” button where they will test their knowledge about ASEAN through various interactive games.



Figure 13: “Play games” game menu page

Geography game

This is a game where users will be tested the knowledge about basic geography of ASEAN. The users will be given names of countries in ASEAN which they will have to match with the given maps and flags of each member countries (refer figure 14).



(a) (b)

Figure 14: Instruction (a) and Geography game (b)

Food game

Food game is a puzzle game where users have to complete the puzzle of national food of each country in ASEAN. The picture of the food comprises of name of that particular food together with the flag of the country of origin of that food. This is a place where users get to learn about food of ASEAN countries. The game allows users to learn while they are playing.



Figure 15: Food game

Local costume game

This is an augmented reality part of the application where users get to play and learn at the same time. Users will be given an AR marker which they will have to wear it on their forehead. Users have to show the marker to the camera, the marker will then display the headdress of country of ASEAN depending on which marker they wear. This game allows users to learn about the traditional costume of each member countries of ASEAN through an interactive game.



Figure 16: Local Costume game

B. Evaluation Results

The system was tested by 5 primary school students aged between nine to twelve years old under the instructions of the developer. Each child tested all the lessons and game modules with accompany by their parents and the developer.

There were two set of questionnaire distributed to each student; pre and post-questionnaire. The survey was carefully designed so that the questions are appropriate with the age and knowledge of the target respondent. The pre-survey was distributed prior to the testing session. The pre-survey contains a set of question about basic knowledge of ASEAN. The session aimed to evaluate the knowledge of the children about ASEAN prior to the testing. The results of the pre-survey will be used to compare with the post-survey later to see whether students understand more about ASEAN after using the application. After the testing session, another simple survey form was also distributed to each child. The form contains the same set of question with the pre-survey form plus another set of question regarding the feedback of the users towards the application. The post-survey aimed to be a session to collect the feedback from the children regarding the usage of the website, lesson and the game.



Figure 17: System Testing

As mention above, the survey is divided into two parts; part A and part B. Part A consists of five simple questions about ASEAN in general. Part B contains seven questions about the feedback of users towards the application.

In part A, the result in the bar chart depicts that in overall there are significant improvements of knowledge about ASEAN of the students after using the application. The results from the pre-survey (see figure 4.13) clearly show that knowledge about ASEAN among the students prior to the testing are very low. Only 20 percent of them or only one person that is able to recognize the flag of ASEAN. 20 percent of them are able to identify the founding year of ASEAN. However, 3 of them or equivalent to 60 percent are able to identify the motto of ASEAN. Unfortunately, none of them do know about the total members of ASEAN. Lastly, 20 percent of them could differentiate the flag of Myanmar.

However, after the testing session, the results (figure 4.14) show that users gain more knowledge about ASEAN and able to answer most of the question. All of them could differentiate the flag of ASEAN from others. While, 4 person or 80 percent of them are able to recognize the founding year of ASEAN. 100 percent of them are able to identify the motto of ASEAN and total numbers of ASEAN members. However, only four of them got it right about the flag of Myanmar.

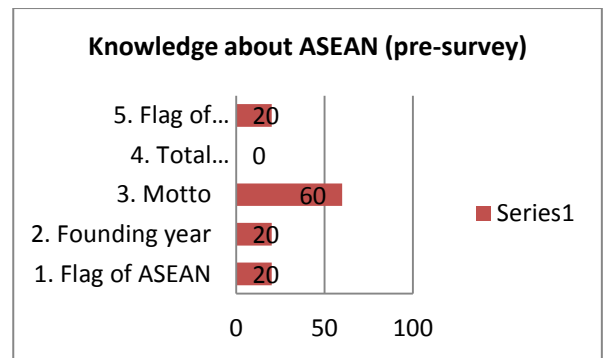


Figure 18: Knowledge about ASEAN (pre-survey)

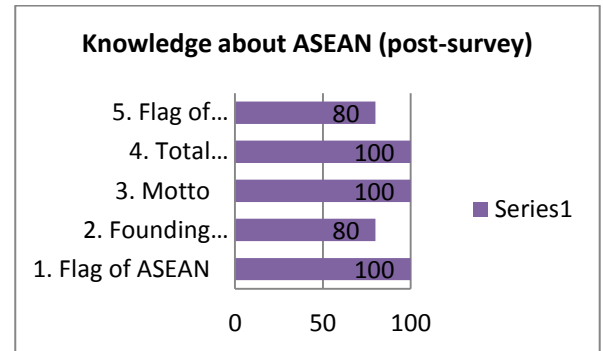


Figure 19: Knowledge about ASEAN (post-survey)

From the result of the survey, it can be said that “ASEAN 4 Kids” has helped students to learn more about ASEAN. There are significant improvements in terms of general knowledge among the users.

In part B, the results show that users are satisfied with the prototype and find it interesting. It also shows that learning culture can be fun and game is another way to help in learning culture. The bar graph below shows the score of each question:

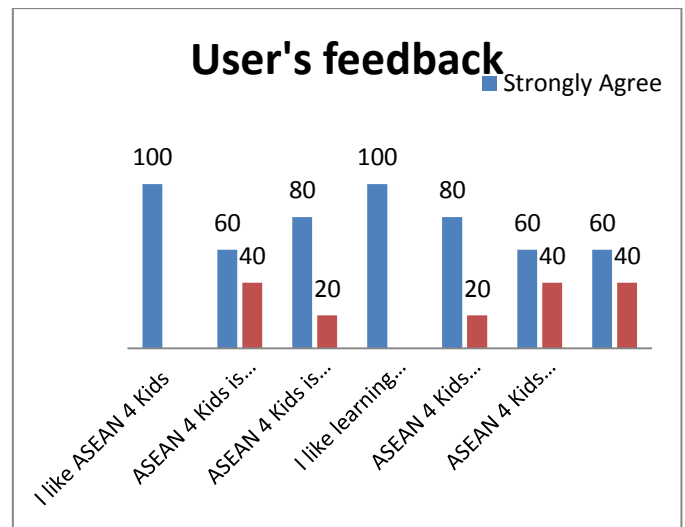


Figure 20: Users' feedback for the system testing

The questions and analysis are as follows:

1. I like ASEAN 4 Kids.
All students strongly agree with the statement. This can be concluded that all of the respondents like the system and would really love to use it.
2. ASEAN 4 Kids is easy to use.
60 percent of the respondents strongly agree that ASEAN 4 Kids is easy to use while another 40 percent agree with the statement. It can be said that ASEAN 4 Kids is user-friendly and definitely easy to use even for a first time user.
3. ASEAN 4 Kids is interesting.
Majority of the respondent which covers 80 percent of them strongly agree that the application is interesting. The remaining also agrees with the statement. Hence, it can be said that users find the application interesting.
4. I like learning culture through game
The entire respondents strongly agree that they love to learn culture through game. Game can be in various forms, Flash-based game is another interesting approach to be used in teaching culture. From the result, it shows that students enjoy learning culture through game; hence, there are huge opportunities for game-based learning in teaching culture.
5. ASEAN 4 Kids helps me to learn about ASEAN in a fun way.
Learning history can be very boring, but not to ASEAN 4 Kids. 80 of the respondents strongly agree that the application helps them to learn about ASEAN in a more fun way.
6. ASEAN 4 Kids makes culture learning more fun.
60 percent of the respondents strongly agree that ASEAN 4 Kids makes culture learning more fun, while the remaining 40 percent agree with the statement. This clearly shows that culture learning can be fun with the help of ICT.
7. I know more about ASEAN after using ASEAN 4 Kids.
All of the respondent agree with the statement, 60 percent of them strongly support the sentence while another 40 percent agree with it. This shows that culture learning can be fun and interactive. It also helps the students to learn the contents while they are playing with the application.

V. RECOMMENDATIONS

For future improvement of the system, there are several recommendation made by the parents and the examiners which are following functions;

- (1.) To add more language than English i.e. Thai, Vietnamese, Bahasa Indonesia
- (2.) To expand the scope for different ages

- (3.) To have more interaction in the mini-lesson
- (4.) To add more games and include more variety of game type.
- (5.) To explore possibility of expanding the application to other platform i.e. mobile device in order to reach out to more audience

VI. CONCLUSION

Culture leaning has often been associated as a boring and non-attractive learning process especially to young children. However, as technology has risen, it has made culture learning more interactive and interesting through the use of ICT. This includes Flash technology, many studies show the benefits of using Flash technology including attracting children attention better than some traditional method, engaging children to learn by doing and visualizing, eliciting social interaction and most importantly it is proved that it helps in developing the knowledge about culture in children.

“ASEAN 4 Kids” was developed to cater the need of an interactive application for learning ASEAN culture. The application aimed to raise awareness and understanding of ASEAN, its people and cultures to young children through ICT. The prototype system was tested with 5 primary school children aged between nine to twelve years old under the instruction of the developer and parents. The results of the study are shown below:

1. Knowledge of students about ASEAN has improved after using the application
2. The students find “ASEAN for kids” interesting and easy to use.
3. The application has helped the student in learning ASEAN culture in a more fun and interactive way.
4. To add more games and include more variety of game type.
5. Game-based approach possesses possibility in improving student engagement in culture learning.

The result in overall showed the excitement of the children towards the system which is a good sign for the implementation in the real learning environment later on.

In conclusion, this project will be benefited to children in assisting their learning of ASEAN and culture of each ASEAN members. Moreover, it will also help in raising awareness and understanding of ASEAN among young generation.

ACKNOWLEDGMENT

First and foremost, all praises to The Almighty for His mercy, graces, blessings and guidance in giving me inspiration to take on this project and giving me strength to get through the challenges in completing this project.

Upon completing this project, I am particularly grateful for the assistance given by all parties who have contributed along the process of completion of this project. Firstly, I would like to express my gratitude to Universiti Teknologi PETRONAS for giving me this precious opportunity to learn new things through accomplishing the final year project.

This gratitude and appreciation also dedicated towards my project supervisor, Associate Professor Dr. Dayang Rohaya Bt Awang Rambli, who had continuously monitored the

progress throughout the duration of the project. Her constructive comments and advices, continuous positive support and guidance have led the project towards its successful final outcome.

A Special thanks to my mother, brothers, and sisters for their endless love, support and encouragement. Thanks for all the sacrifices that you've made on my behalf. Your prayer for me was what sustained me thus far.

Last but not least, Thanks to all my fellow friends, seniors (Wannisa Matcha, Yossawadee Kaemanee) and anybody who has contributed directly or indirectly toward accomplishing this project. Without your support and cooperation this project would not be possible. Thank you very much and May god blesses all of you

REFERENCES

1. ASEAN Secretariat. (1992). Retrieved October 25, 2012, from The official website of the Association of Southeast Asian Nations: <http://www.aseansec.org/20024.htm>
2. Austria, M. S. (2001). "Moving Towards an ASEAN Economic Community", Springer Science+Business Media B.V.
3. Azuma, R., Bailiot, Y., Behringer, R., Feiner, S., Julier, Julier., & MacIntyre, B. (2001). "Recent Advances in Augmented Reality", IEEE Computer Graphics and Applications, 34-47.
4. Azuma, R. (2001). "A Survey of Augmented Reality", Teleoperators and Virtual Environments 6, 4 (August 1997), 355-385.
5. Billinghamurst, M. (2002). Augmented Reality in Education. December 2002 New Horizons for Learning. Available at <http://www.newhorizons.org>
6. Downes, T. Arthur, L., & Beecher, B. (2001). Effective learning environments for young children using digital resources: An Australian perspective. In Information Technology in Childhood Education Annual, 1,139-153. Norfolk, VA: AACE.
7. Fisch, S. H. (2005). "Making Educational Computer Games Educational", IDC.
8. Guerrero, R. B. (2010). "Regional integration: the ASEAN vision in 2020", IFC Bulletin No 32.
9. Flintoff, JP. (2002). "Children get smart with their computer games: shooting baddies may help the development of academic skills", Financial Times.
10. Garner, R., Brown, R., Sanders, S., & Menke, DJ "Seductive details" and learning from text. In K.A. Renninger, S. Hidi, & A. Krapp (eds.), The role of interest in learning and development (pp. 239-254). Lawrence Erlbaum Associates, Mahwah, NJ, 1992
11. Go, C. A. L., & Lee, W. H. (2007). "Digital Game-Based Learning: An Agent Approach", Springer-Verlag Berlin Heidelberg.
12. Institute of Southeast Asian Studies. (2010). Know your ASEAN. Singapore: ISEAS Publishing.
13. Green, B., Reed, J., and Bium, C. Teaching the Nintendo Generation? Children, compute culture, and popular technologies. In S. Howard(ed.). Wired UP. Page. 19-42. UCLPress: London,1998.
14. Keller, J. M. Motivational design of instruction. In C.M. Reigeluth (Ed.), Instructional design theories and models: an overview of their current status. Hillsdale, NJ ; Lawrence Erlbaum, 384-434, 1983.
15. Kesim, M., & Ozarslan, Y. (2012). "Augmented reality in education: current technologies and the potential for education", Procedia – Social and Behavioral Science 47, page 297 – 302.
16. Lamb, A., & Johnson, L. (2006). "Flash: engaging learners through animation, interaction and multimedia". Teacher Librarian 33 Vol.4, 54-56.
17. Lin, K. C and Wei, Y. C. Online Interactive Game-Based Learning in High School History Education: Impact on Educational Effectiveness and Student Motivation, National Chung Hsing University, 2011
18. Martin-Gutierrez, J., Saorin, J. L., Contero, M., & Alcaniz, M. (2009). "Design and validation of an augmented book for spatial abilities development in engineering students", Computers & Graphics
19. Mayer, R. E., & Moreno, R. (2002). "Animation as an Aid to Multimedia Learning", Educational Psychology Review, Vol. 14, No. 1.
20. Mitchell, A., and Savill-Smith, C.. The use of computer and video games for learning: A review of the literature. London, UK: Learning and Skills Development Agency, 2004
21. Munn, N. L., Femald Dodge, L., and Femald, D. S. Introduction to psychology. Boston: Houghton Mifflin Co, 1969.
22. Neo, M., & Neo, K. T. K. (2001). "Innovative teaching: Using Multimedia in a problem-based learning environment". Educational Technology & Society 4
23. Oh, S., & Woo, W. (2008). "ARGarden: Augmented Edutainment System with a Learning Comparison", Springer-Verlag Berlin Heidelberg.
24. Omar, R., Jan, J. M., Abd Hamid, H. & Mat Akhir, A. (2009). The Humanities in ASEAN Studies and Higher Education – Teaching of ASEAN History in Higher Education. Paper presented at the Conference on the Humanities 2009, Malaysia.
25. Pasadilla, G.O. (2004), East Asian Co-operation: The ASEAN View, Philippine Institute for Development Studies, Discussion Paper Series, No. 2004- 27, August 2004.
26. Perez-Lopez, D., Contereo, M., Alcaniz, M. (2010). Collaborative Development of an Augmented Reality Application for Digestive and Circulatory System Teaching. Paper presented at the 10th IEEE International Conference on Advanced Learning Technologies.
27. Prensky, M.: Digital Game-Based Learning. McGraw-Hill, New York (2001)
28. Prensky, M. Digital game-based learning. Computers in Entertainment, 1(1), 21-21, 2003.
29. Reilly, W. J. A manual for the use of the motivated strategies for learning questionnaire (MSLQ). MI: Ann Arbor. 1983.
30. Rodolfo, C. S. Jr. (2002). ASEAN Today and Tomorrow, PT Maksimedia Satyamitra.
31. Saluveer, E., (2004). Teaching Culture in English Classes. Department of English, University of Tartu, Estonia.
32. Serio, A. D., Ibanez, M. B., & Kloos, C. D. (2012). "Impact of an augmented reality system on students' motivation for a visual art course", Computer & Education.
33. Seelye, H. N. 1993. Teaching culture: Strategies for intercultural communication. 3rd edition. Lincolnwood, IL: National Textbook Company.
34. Stern, H. H. 1992. Issues and Options in Language Teaching. Oxford: Oxford University Press.
35. Tepperman, L., Curtis, J., Wilson, S. J. and Wain, A. 1994. Small World. International Readings in Sociology. Ontario: Prentice Hall Canada INC.
36. The Association of Southeast Asian Nations, Charter of the Association of Southeast Asian Nations, October 20, 2007, available at: <http://www.aseansec.org/64.htm> [accessed 26 October 2012]
37. Thompson, E. C., & Thiantahai, C. (2008). "Attitudes and Awareness towards ASEAN : Finding of a Ten-Nation Survey", ISEAS Publishing.
38. Wang, H., Tsai, S., Chou, C., Hung, H. The study of motivation and reasoning faculties of Game-based Learning in Elementary school students, 2010 2nd international Conference on Education Technology and Computer (ICETC), 2010
39. Verenikina, I., & Herrington, J. (2008). "The affordances of computer play in young children: A preliminary study" University of Wollongong.
40. Zainuddin, N. M M., Zaman, H. B., & Ahmad, A. (2009), "Learning Science Using AR Book: A Preliminary Study on Visual Needs of Deaf Learners", Springer-Verlag Berlin Heidelberg.
- Zhang, H. Y. (2009). An educational Flash game for pre-school children. Paper presented at the 1st International Conference on Information Science and Engineering (ICISE2009)

