CHAPTER 1

INTRODUCTION

1.1 Overview

Multimedia technology plays an important role to ensure that the multimedia application developed has an effective quality design (Fan, 2017). The used of multimedia technology that combines multimedia elements namely text, graphics, audio, animation, and video in various educational learning can attract students to learn effectively. It facilitates the process of accessing information and increases the effectiveness of the learning process through a combination of various forms that are easy to understand (Budiarto et al., 2019). Learning an Islamic education in Quran memorization will attract the students' attention if the teacher uses multimedia technology in the learning process (Tedi et al., 2020). Moreover, the use of multimedia technology has also become a practical learning model, so it will be able to improve learning processes and performance as well as motivation through a technology environment. Thus, it can be concluded that multimedia technology has various positive effects and makes the learning process more fun and enjoyable (Fetaji et al., 2018).

Aligned with current developments in the multimedia technology field, multimedia applications that applied a Cognitive Theory of Multimedia Learning (CTML) for mobile devices have made a major contribution to the development of model design in various fields namely science, psychology, medicine, and education. It brings many benefits to the industry, making it increasingly popular as a tool for knowledge acquisition in a meaningful representation.g memorizers frequently memorize the Quran in daily activities via mobile applications (Saepudin et al., 2021).

The model of Quran memorization is broadly used as a method and technique of mobile applications that can assist in memorizing the Quran. Quran memorization techniques refer to the method to ensure the Quran remains intact in the hearts used by ancient scholars in preserving knowledge of the Quran (Aziz et al., 2019). They have many techniques and the most commonly used are repetition, segmentation, reading, and writing (Hadi, 2018; Marzuqi et al., 2020). Many researchers studied the methods and techniques of Quran memorization through a model designed to fulfill the user's needs. It is commonly applied and displayed in mobile applications, websites, and systems with different modes of learning. It is also beneficial as they accelerate the process of Quran memorization through the interaction design of the interface on mobile devices (Masaaki, 2020). The techniques that integrate with modes of learning can create a better visualization (Nassourou, 2012), easy to recognize (El-hussari, 2020) and imitate (Curkovic, 2018) as well as to remember (Pradhana et al., 2019). Therefore, the designing model with the interaction design of the interface plays an important role in the process of learning which motivates them to continue to memorize (Roslan et al., 2019; Salehuddin et al., 2019).

The cognitive theory of multimedia learning or Mayer's model addresses how individuals process information, and how they learn through multimedia approaches. The elements of model design are the significant component of the mobile user interface that contributed to the usability of applications and user motivation. The guidelines for the model design are substantial, specifically relating to the modes of learning style that support the individual differences as attributes of model design. Therefore, the model design for Quran memorization techniques must be designed properly.

Otherwise, this will create difficulty and confusion (Laila et al., 2015; Musa et al., 2018; Shahrulkarnain, 2013).

For this research, the model design for Quran memorization techniques that support individual differences in modes of learning was studied in its elements to assist in illustrating the model design for motivating students to memorize the Quran verse and translations. Certain approaches in the model design analysis can be used to motivate users to memorize the Quran. Quran has the most complete knowledge and memorizers need to read, memorize, and understand it for practice in daily life. Therefore, using the model design of Quran memorization techniques that support individual differences in modes of learning can help users memorize the Quran and motivate them in memorizing the Quran.

Therefore, this chapter discussed the background and issues on the model design for the Quran memorization technique and Quran memorization among students in the Quranic domain. This chapter covers the research background, problem statement, research objectives, research questions, hypothesis, the significance of the study, scope of the study, thesis structure, and conclusion. This chapter also discussed the research framework for the study being conducted. The operational definitions are also given that define the concepts and the key terms contained in this study to facilitate the readers to understand the whole thesis including thesis structure, and conclusion.

1.2 Research Background

Multimedia technology as a medium and communication method plays an important role in the transmission and circulation of information in the modern teaching and learning process. Innovation in multimedia learning is one of the aspects that need

more attention in the development of multimedia design research (Mayer, 2021; Yao et al., 2021). The development of multimedia technology also gives a technical appearance with more powerful advanced interactive skills to meet the needs of the current education and industrial development (Sunardi et al., 2020). However, the use of technology receives less attention among teachers due to the constraints of training facilities that focus on the multimedia application including a lack of desire to innovate in diversifying learning strategies, techniques, and media as an alternative method of teaching and learning, especially in the Quran memorization studies (Engkizar et al., 2017). Altering the traditional teacher-centered classroom and developing a student-centered interactive study mechanism in physical education teaching provides a supportive environment based on emergent information technologies namely multimedia interactive technology. In the past, most of the Quran memorization teaching platforms were built on static material and resources. But nowadays, the teaching and learning platform based on multimedia technology is concentrating on classroom teaching, collecting, and storing classroom data, which is a new change in the data acquisition of the original information-based assisted in teaching and learning mode (Cai et al., 2019). Teaching and learning need to consider the characteristics of multimedia technology integration through a variety of multimedia approaches to motivate the students with support learning materials in the classroom (Marna et al., 2020). This is because not all learning materials can be accepted with the same approach by all the students. For example, static images play a role in the production of multimedia-based learning materials. However, auditory students, face difficulties in accepting learning without audio elements in the multimedia products developed causing it to not be used wisely. The design of multimedia application learning that

incorporates interactive multimedia elements may give a positive impact on the user when the application is easy to learn, attracts attention, and achieves user satisfaction. Thus, for designing an interactive multimedia application, designers need to consider the characteristics of the user in terms of who uses it, how they use it, and where it will be used (Sharp et al., 2019).

The advantages of multimedia technology allow students to receive exposure to an interactive multimedia environment in learning to memorize the Quran. Typically, the practice of Quran memorization was used by earlier scholars to store knowledge, especially in preserving the contents of the Quran from manipulation and alterations (Ismail et al., 2019). It is undeniable that each school adopts its own different Quran memorization methodology and techniques (Ariffin, 2011; Ariffin et al., 2015; Ariffin & Wahid, 2014). A study by Maimun & Yasin (2019), stated that the Quran memorization methodology approach requires students to master reading skills well before starting the process of memorizing the Quran. They also explained that in strengthening the memorization of the Quran, students need to follow the specific rules and consistent schedules recommended by the school. In the process of memorizing the Quran, students need to read each of the verses Quran repeatedly by focusing on the correct pronunciation (*makhraj*) and punctuation (*tajwid*) until complete the whole of the Quran. Md Nawi & Salleh (2017) in their study on the variations of *Tahfiz* models from fourteen (14) schools throughout Malaysia found that a quality *tahfiz* institution must meet several key features namely developing student potential with a balanced, integrated, comprehensive, innovative, and creative in line with the current developments based on principles of Islam. They have built four (4) *Tahfiz* model studies that meet all these characteristics. The models emphasized the quality of

memorization and comprehension of Quran verses as well as the mastery of the Arabic language continuously and systematically. There are three main aspects need to emphasis in the *Tahfiz* assessment system namely memorization test (*syafawi / tahriri* test), comprehension test (*syafawi / tahriri* test) and retention test on order to provides an efficient model. This situation can increase the level of memorization literacy of students gradually in primary, secondary and tertiary education.

Research studies by Hashim et al., (2013); Md Sawari et al., (2019); Zakariya et al., (2020) found five stages of Quran learning presented from the book of Al-Qabisy including the process of reading, exploring, understanding, memorizing, and writing. He also suggested that *Tahfiz's* teaching and learning used a variety of senses namely listening, seeing, reading, and writing techniques. These five (5) stages also cover the three domains of learning actives as introduced by Bloom et al., (1956) namely cognitive, affective, and psychomotor. The conflict arises with the revised version of Bloom's taxonomy in the Islamic perspective that memorizing is not a low level of thinking (Masrom et al., 2018). Memorizing the Quran requires a high degree of concentration on mentally repeating the words read with the aid of word visualization (Norizah et al., 2014) and recall them with the necessary techniques in an easily accessible form when needed (Ni & Nurul Asyikin, 2019).

Memorizing the Quran is a great challenge and responsibility for every *Huffaz* to preserve the knowledge of the Quran in their memory (Ismail et al., 2019). Learning the Quran memorization skills is often considered difficult because it requires continual repetition of certain techniques to retain the memory (Salisu, 2020). Most *Tahfiz* institutions use repetition and reading techniques verse by verse repeatedly in memorizing the Quran (Sirin S, Metin B, 2021). Although various methods and

techniques of Quran memorization have been introduced to memorize the verse of the Quran, not all *Tahfiz* institutions have succeeded in producing *Huffaz* (Sedek 2011). Moreover, memorizing the Quran verses with the translation is not fully implemented and adopted by the teachers in the *Tahfiz* curriculum because the process takes a longer time to complete (Abdul Jalal et al. 2015) compared with the process of memorizing verses only. Thus, there is also a need to improve the quality of teaching and learning in the *Tahfiz* curriculum through a variety of Quran memorization techniques with the most current interactive teaching aids (Haron et al., 2021; Ismail et al., 2019).

Hence, this study would like to explore the model design of Quran memorization techniques that focuses on the elements of multimedia interactive technology that support individual differences using multiple senses. The sense of visual, auditory, reading, and kinesthetic may benefit from the student's VARK learning styles and preferences modes of learning. Therefore, the model design can be enhanced in the technology research field to increase the motivation and capability of memorizing, understanding, and practicing the skill to memorize efficiently. This study will propose an appropriate model design to be used and assist the process of memorizing the Quran verses and translation of *Surah Al-Insaan* as a prototype.

1.3 Problem Statement

The tradition of memorizing the Quran has uniquely attracted many scholars' attention from numerous perspectives with different research methodologies. Nevertheless, there is an absence of research that discovers the techniques of memorizing the Quran based on the student's differences in VARK learning style from the cognitive multimedia learning viewpoint. Multimedia technology has been widely

used in multimedia design to deliver information in multiple ways to different types of learners. A well-designed user interface in the model contributes to a positive user experience, increased user engagement, motivation, and retention. Research by Abdullah et al., (2003) and Amalina Ulya, (2015) found that a good selection of methods and techniques in memorizing the Quran can give a positive impact on student's motivation in the memorization process through understanding the verses memorized, repeating the reading before memorizing, listening before memorizing, writing before memorizing, dividing of verse by chunking, visualizing the verse to be memorized in current memory.

According to Marzuqi et al., (2016), the difference in strategies of *Tahfiz'*s learning style results in the absence of proper strategy, techniques, and motivation. The use of modern technology in teaching aids had increase the student's motivation in memorizing the Quran (Marzuqi et al., 2020). However, teachers do not emphasize the use of technology in teaching due to a lack of exposure or preparation (Marzuqi et al., 2016). This is contrary to research by Al-Ahwani, (1995); Al-Fida' & Izzat, (2006); Jaafar & Julia ; Ariffin, (2018) that suggested an educator diversifies the uses of the senses in teaching and learning the Quran memorization. Multimedia technology used in Quran memorization learning can increase students' motivation through applying an effective memorization technique and supporting preferences VARK learning style using their dominant sensory modalities (Salisu, 2020). Teachers are advised to increase student motivation through more engaging teaching and learning activities with the use of audio-visual (Çakiroğlu et al., 2019; Salsidu et al., 2018; Sit, M., Dahlan, Z., & Panjaitan, 2021; Zainun et al., 2019; Zavgorodniaia et al., 2018), kinesthetic movement (Metzler, 2016; Salamah, 2019) through matching the students' differences in VARK

learning styles preferences (Jamila, 2021; Shakir & Ebrahim, 2020; Stirling & Alquraini, 2017).

Previous studies have also shown applications that use multimedia technology provide many benefits to Quran memorization not only for children but also have a positive impact on teenagers and adults (Fatimah et al., 2019; Hamiz, M. et al., 2014). It is also able to attract attention, and retain memory (Sirin S, Metin B, 2021; J. Zhang, 2019) as well as increase student motivation (Ogay, 2020). It is also a good and interactive teaching aid that enables the control, segmenting, and modality effects in the content flow of information (Chen & Yen, 2021; Made Rajendra & Made Sudana, 2018) to allow them to study, practice, and reinforce independently. Multimedia technology also can act as a teaching model, medium of instruction, and sensory memory element (Mayer, 2009). These three functions have attracted the interest and attention of students to memorize once multimedia was used and integrated into teaching and learning activities. Studies by Ismail et al., (2014); Umar & Aziz, (2015) stated that multimedia elements support the use of various senses that can stimulate the sensory memory to retain information for a long time and can be quickly accessed. A study by Hamzi et al., (2021) also mentions that the use of digital tools has a direct influence on memorization as a learning process that affects long-term memory. Multimedia can also increase user retention and understanding as well as user experience and motivation. Moreover, it attracts users' attention and makes them concentrate on learning. In addition, by using multimedia learning, students can also consider their capabilities to choose their preferred VARK learning styles that relate to the use of multiple sensory modalities to enhance their thoughts and motivation for learning (Murphy & Gray, 2014; Triastuti, N. J., & Mauliyani, 2018; Wongsuphasawat et al., 2018).

Innovative approaches using a mobile digital device can bring great changes to various fields (Burden et al., 2019; Shuib et al., 2018). Many researchers (Abdul Aziz & Jaafar, 2018; Hamdani & Yulianto, 2020) had developed mobile applications with multimedia elements to facilitate the process of memorizing the Quran interactively. This new trend has influenced the conventional approach of memorizing the Quran digitally (Ramadane & Souad, 2017). Students 'ability to remember some important facts is different and limited if they use a single reading medium namely a textbook (Zainiyati et al., 2021). Many studies focus on the techniques of memorizing the Quran through the conventional Quran using *mushaf* (Ariffin et al., 2013; Sedek et al., 2014; Sidek et al., 2020) and mobile applications (Al-Mosallam, 2013; Almosallam et al., 2015; Melhem et al., 2017; Osman et al., 2021; Purbohadi et al., 2019). Most of the previous studies focus on memorizing Quran through the features provided in the mobile application namely searching, translation including reading, and listening (Zakariah, Khan, Tayan, et al., 2017). The study by Mubin et al., (2020) proves that some mobile application provides interaction in learning the Quran with multi-representation. It presents or re-abstracting acknowledge, information, or a concept into several different forms, either verbally (auditorial) or visually (symbolic, pictorial) (Chalid et al., 2018) which will be absorbed by the brain in a variety of different ways. Chalid et al. (2018), also mention that the process of memorizing the Quran becomes easy through a learning model based on the multi-representation method. Specific information can be understood when represented with accurate media of representation. Moreover, students can increase their level of motivation in memorization of the Quran through the used of multimedia elements namely text, audio, video, graphics, and animation (Ahmad Bazli et al., 2017; Sulaiman et al. 2017).

Studies by Aziz et al., (2019); Buzdar & Farooq, (2020) mentions that there is still a lack of learning aids developed for students to memorize the Quran. Many efforts need to be implemented in developing teaching and learning aids to reduce the literacy gap in Quran memorization skills using current interactive multimedia technology. Besides, one issue is that students have less motivation in memorizing the Quran due to a lack of techniques and low comprehension of Arabic for memorizing the Quran although many technologies are available (Abdullah & Sabbri, 2021). The elements of the Quran memorization model design are less explored and still limited especially related to memorization techniques (Azmil & Misnan, 2015; Hamiz, M. et al., 2014; Pradhana et al., 2019; Sidek et al., 2020) that support VARK learning style and the preferred learning modalities (Cabual, 2021; Salisu, 2020) to visualize, recognized, imitate including the motivation interest (Gamal, 2018; Musa et al., 2018). Poor selection of the Quran memorization technique model design might lead to difficulties, confusion, and comprehension problems (Abdullah & Educational, 2021). Therefore, the proper Quran memorization techniques design model needs to develop to ensure the model is easy to learn, satisfies, and motivates users. The model design research might be improved by concentrating on the proposed elements of interactive multimedia that can be applied to the design model in terms of visualizing, recognizing, and imitating skills for the Quran memorization process.

Based on the issues discussed earlier, the researcher found there were gaps and potential for model design for Quran memorization techniques based on the student's preferred VARK learning style with the use of multiple sensory modalities in memorizing the Quran that can be explored in this research. Hence, this study would like to explore the Quran memorization techniques design that focuses on the element

of sensory modalities that motivates the student to memorize the Quran. This study will propose a model of Quran memorization techniques based on the VARK learning style (EzHifz model) in the context of cognitive multimedia learning that applied interactive multimedia technology. The model can assist students to optimize their strength of sensory memory using visual, auditory, reading, and kinesthetic to recognize and imitate thus motivating them in memorizing the Quran verse and translation. This model adapts the Cognitive Theory of Multimedia Learning by Mayer (2005) with an effective Quran memorization technique by employing four (4) components of the VARK Learning Style Model (Fleming, 2012), four (4) components of the Multiple Intelligence Model (Gardner, 2011), four (4) components of ARCS Motivational Model (Keller, 2010) including the literature review, comparison with previous studies of Quran memorization techniques from the previous studies and preliminary study to be adapted into the model to produce the model of Quran memorization technique based in VARK learning style that can motivate student in memorizing the Quran. A preliminary analysis conducted confirmed the existence of this problem is detailed in Chapter 4.

1.4 Research Objectives

This study has the following objectives:

i) To identify the multimedia representation learning model elements for Quran memorization techniques based on VARK learning style.

ii) To design and develop the model of multimedia representation learning for motivating in memorizing Quran.

iii) To evaluate the usability and user motivation of Multimedia Representation Learning Prototype (EzHifz) for memorizing Quran.

1.5 Research Questions

To achieve the stated objectives of the study, several research questions were formulated as follows:

i) What are the appropriate multimedia representation learning model elements for Quran memorization techniques based on VARK learning style?

ii) How to design and develop the model of multimedia representation learning for motivating in memorizing the Quran?

iii) What are the responses to the usability and user motivation of Multimedia Representation Learning Prototype (EzHifz) for memorizing Quran?

iv) Does the usability of the EzHifz prototype for memorizing Quran influence students' motivation in memorizing the Quran?

1.6 Hypothesis

Based on the research question, one hypothesis has been developed and tested through statistical analysis is :

H1: There is a positive relationship between the usability of the EzHifz prototype and the student's motivation in memorizing the Quran.

1.7 Significance of the Study

The Quran memorization methodology is widely used in Quranic fields and technology fields to deliver methods and techniques to memorize the Quran (Aziz et al., 2019). The model of Quran memorization techniques based on the VARK learning

style brings many benefits to the teaching and learning system, making it increasingly popular as a tool for memorizing using a combination of techniques based on individual differences in VARK learning styles. The benefit of the model is supporting the different modes of presentation (Umar & Aziz, 2015) through selections modes of learning depending on the strength of the individual VARK learning style model that refers to the aspect of sensory modalities, enhancing the skill of memorizing through visualization, recognize and imitate (Leasa et al., 2017; Raja Jamilah, 2011). Therefore, it is believed that the multimedia representation learning model (EzHifz model), which was designed based on a multimedia interactive approach that integrates multimedia technology, principles, and techniques may optimize the strength of sensory memory through visualizing, recognizing, and imitating skills thus motivating students in memorizing the Quran verse and translation. Therefore, this study proposed an EzHifz model framework to adapt the model of Cognitive Theory Multimedia Learning (CTML) by Mayer (2005) and employed four (4) components of the VARK Learning Style Model (Fleming, 2012), four (4) components of the Multiple Intelligence Model (Gardner, 2011), four (4) components of ARCS Motivational Model (Keller, 2010) including the literature review, comparison with previous studies of Quran memorization techniques from the previous studies and preliminary study to be adapted into the model. In general, this study contributes to the field of multimedia design in the context of Quran memorization methodology. This study also contributes to the body of knowledge in the technology field relating to the model design, principles, and techniques for the Quran memorization. This will enrich the literature review on Quran memorization techniques using multimedia design elements that focus on the new

approach to enhance the memorization skills based on preferred VARK learning style and motivates user to memorize the Quran.

This study applied the ADDIE Model, which explained the systematic process to develop a model of Quran memorization techniques based on the VARK learning style (EzHifz model) and the EzHifz application prototype. The experimental design was conducted to test the usability of the application and the user motivation of the student as respondents. This study contributes to the framework design for the model of the Quran memorization technique based on VARK learning style, low and high-fidelity design, and evaluation of the EzHifz prototype represents the EzHifz model on the usability and motivation that can be a guideline for other researchers.

This is the new approach in the research of multimedia design in the context of Quran memorization methodology which focuses on the techniques and selection of modes of learning based on the preferred VARK learning style in memorizing the Quran verse and translation. The integrations of thirteen (13) Quran memorization techniques namely reading, listening, comprehension, repetition, keyword, segmentation, visual map, open-close, pointer, highlight, association, movement, and zooming in the model support the strength of memory sensory while memorizing the Quran through the skills of visualizing, recognizing and imitating. This study potentially will provide an alternative tool or teaching aid and a systematic process of memorizing the Quran using the hierarchy of learning independently. The EzHifz application can enrich the Quran memorization media as a supportive tool. Furthermore, the study contributes to the evaluation of the model of multimedia representation learning through the EzHifz prototype on the aspect of usability and motivation. Thus, it is hoped that this research will contribute theoretically, methodologically, and empirically to the body of

knowledge of multimedia design in the context of Quran memorization methodology to assist Quran memorization.

1.8 Scope Of The Study

This study involves 35 students aged between 10-18 years in the first phase and 20 students aged between 10-15 years in the second and third phases from *Tahfiz* Integration School, Sepang Selangor. This study implemented the method of user testing on the EzHifz application developed that represents the EzHifz model design using survey and observation. The students were selected based on several criteria and the evaluation was performed one student at a time. This study was conducted at *Tahfiz* Integration School, Sepang Selangor for the following reasons:

i. The background student selected has not memorized the surah included in the prototype *(Surah Al-Insaan)* and has almost one (1) year of experience memorizing the Quran.
ii. All students are encouraged and trained to use 2 types of mushaf by the school before being taught how to memorize the Quran.
iii. All students were trained to memorize the Quran verses with their translations using the methods and techniques proposed by the school for the Quran memorization (Per word) course.
iv. This is in line with the model development which focuses on the methods and techniques to memorize the Quran. The model was created to support a digital learning environment with the principles of multimedia design.

1.9 Research Framework

Figure 1.1 summarizes the research framework for EzHifz Model Design. The framework discussed the work processes involved in this study. The research framework is based on the ADDIE instructional design model (Gagne et al., 2005). Three (3) main phases are involved in this study: the analysis phase, design, development, and implementation phase as well as the evaluation phase. The study adapts the Cognitive Theory of Multimedia Learning (Mayer, 2005) and employed four (4) components of the VARK Learning Style Model (Fleming, 2012), four (4) components of the Multiple Intelligence Model (Gardner, 2011), four (4) components of ARCS Motivational Model (Keller, 2010) including the literature review, comparison with previous studies of Quran memorization techniques from the previous studies and preliminary study to be adapted into the model. There was an evaluation of the learnability and user satisfaction of the EzHifz model using Nielsen's usability (Nielsen, 1994; Nielsen & Molich, 1990) and motivation of users using the ARCS motivational model (Keller, 2010).

In the analysis phase, the analysis stage focused on the requirement analysis of the study and literature review. This stage employed the first step in the ADDIE model, defining the problem and objective of the model to develop a defined purpose, objectives, and requirements for the EzHifz model design to determine the functions and process plan involved. The review of the study covers the topic of multimedia elements and tools in learning, different learning styles of the learner, sensory modalities in memorization, Quran memorization techniques, and their applications design, as well as theories of CTML, VARK learning style and Multiple Intelligence Model (MI) that was related to cognitive intelligence. Cognitive Theory Multimedia

Learning (CTML) was selected as the theory for this study due to its suitability and practicality. It is also based on the human information processing system and involves cognitive processes in multimedia learning through the interpretation of multimedia presentation elements (selected and organized dynamically) to produce logical mental constructs. The researcher performed the literature review and comparison with previous studies to understand the concept of cognitive intelligence in the cognitive multimedia learning environment to adapt Mayer's model with appropriate elements for the EzHifz model design. Previous methods and techniques were analyzed by comparing the Quran memorization techniques elements and their applications. There are limited studies conducted in the areas of multimedia design focusing on the cognitive multimedia learning viewpoint related to Quran memorization techniques based on the VARK learning style. Therefore, it is possible to implement adapted elements of CTML in the model design of Quran memorization techniques for visualizing, recognizing, and imitating the Quran verse and translations memorized. The comparative analysis also determined the most used Quran memorization techniques elements. Mayer's model was adapted with thirteen (13) Quran memorization techniques elements (reading, listening, comprehension, repetition, keyword, segmentation, visual map, open-close, pointer, highlight, association, movement, and zooming); multimedia presentation elements (pictures of body motion and hand gestures) instead of words and pictures; sensory memory elements (visual, auditory, reading, and kinesthetic) replacing eyes, and ears; working memory elements (signs, gestures model) instead of images, pictorial model, voice and verbal model; and long-term memory element which remain as prior knowledge. The results of the

literature review, comparison with previous studies, and preliminary study answered the first (1) research question of this study.

The design phase involves the low-fidelity EzHifz model design using the low-fidelity embedded with Mayer's model and its adapted elements namely thirteen (13) Quran memorization techniques, one (1) multimedia presentation element, four (4) sensory memory elements, and two (2) working memory elements. In this phase, the functionality was applied to decide how the low-fidelity of the EzHifz model design and foundation of the EzHifz model interface was positioned including the learning strategy. This step visually conceptualized the main features of the EzHifz model design. This stage employed the proposed elements from the analysis phase and added the elements of the ARCS motivational model using fidelity namely low-fidelity and high-fidelity. The fidelity steps involve sketching the EzHifz model design until the model design is finalized. The sketching was performed using paper-based and digital design using Adobe Photoshop software. The output of this design phase is the EzHifz model design. The results of the EzHifz model design and validation answered the second (2) research question of this study. In the development phase, the flowchart and storyboards were illustrated to provide an arrangement of the content, the connection between the screens, and navigation through the application. This phase also develops elements of the EzHifz model and the ARCS motivational model (Attention, Relevance, Confidence, Satisfaction). The screen interfaces were performed using Adobe Photoshop and Macromedia Flash software. The output from this development phase produced an EzHifz application prototype. In the implementation phase, the testing media, testing units, and testing integration of media and units were conducted through an interview with twenty (20) students at *Tahfiz* Integration School, Sepang Selangor.

The EzHifz model design elements were validated by six (6) experts from the Quran field and the Educational Technology field. The results from the interview and validation processes are discussed in detail in Chapter 4. The EzHifz application represents the EzHifz model and was then tested and evaluated in the evaluation phase.

In the evaluation phase, the EzHifz prototype was tested on the aspect of the usability of the application and user motivation using the quasi-experimental method with purposive sampling. The evaluation phase employed two components of the Nielsen usability model namely learnability and user satisfaction (Nielsen, 1994; Nielsen & Molich, 1990), and four components of the ARCS motivational model (Keller, 2010). The testing of the EzHifz prototype that represents the EzHifz model was conducted with twenty (20) students. The data analysis of this study was performed using SPSS 23.0 through descriptive and correlation analysis including the percentage of success. The results of the EzHifz prototype and the hypothesis were the direction to answer the third (3) and fourth (4) research questions of this study. Overall, this study has positively contributed to the model of multimedia representation learning for motivating in memorizing the Quran verse and translations, the fidelity of the EzHifz model design, and the validation of the elements and EzHifz application prototype. The responses of evaluation were received in the aspect of usability of the application and user motivation. It is hoped that the proposed EzHifz application prototypes that represent the EzHifz model design used as a supportive tool and motivate in memorizing the Quran. The results of the evaluation phases are discussed in Chapter 5. The research framework for this study is shown in Figure 1.1.

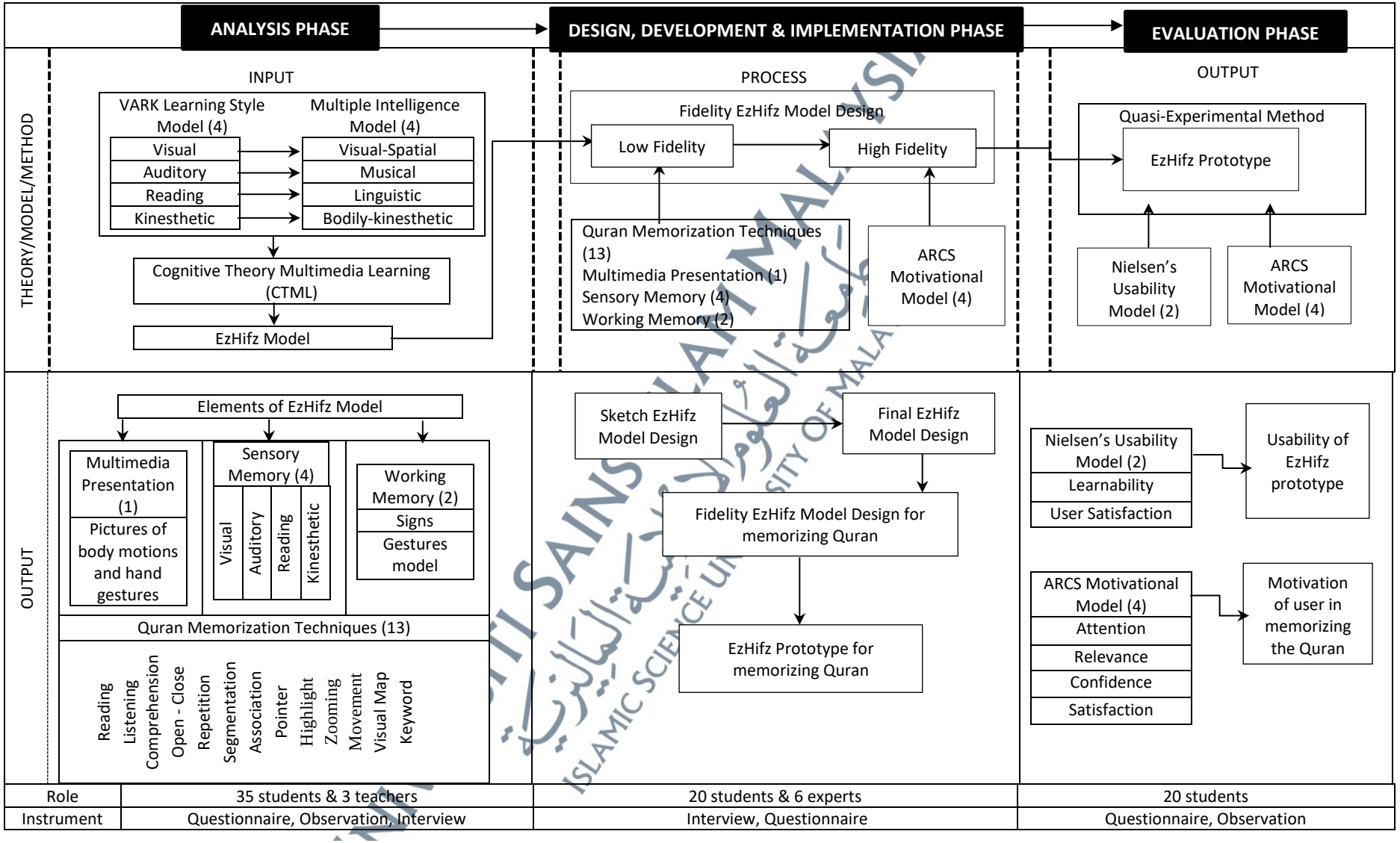

Figure 1.1: Research Framework

1.10 Theoretical Framework

The theoretical framework is the foundation of the research structure which contains several theories and models that support the research conducted. The theoretical framework is also used as a direction for the whole study by guiding the selection of effective teaching and learning processes and practices (Wang, 2015) and assisting development (Kumar & Mohite, 2016). Based on the literature on the theory and model related to this study, the researcher illustrated the theoretical framework for this study as in Figure 1.2. This study employed the Cognitive Theory of Multimedia Learning (CTML) (Richard E. Mayer 2005) as the foundation theory for this study. This theory was chosen because it focused encourage students to develop coherent mental representations and to understand the information learned using sensory modalities and is most suitable for this study. The elements in Mayer's theory were also mapped with the proposed EzHifz model design elements for the EzHifz prototype from the literature analysis for memorizing the Quran. Four (4) components from Mayer's model are (i) multimedia presentation (words, pictures); (ii) sensory memory (ears, eyes); (iii) working memory (sounds-verbal model, images-pictorial model); and (iv) long term memory (prior knowledge). This research also integrates four (4) elements (visual, auditory, reading, and kinesthetic) of the VARK Learning Style Model (Fleming, 2012), four (4) elements (linguistic, visual-spatial, bodily-kinesthetic, and musical) from the Multiple Intelligence Model (MI) (Gardner, 2011) and four (4) elements (attention, relevance, confidence, and satisfaction) of ARCS motivational model (Keller, 2010) to design the EzHifz Model. The evaluation of the EzHifz prototype proposed two elements (learnability and user satisfaction) of Nielsen's Usability Model (Nielsen,

1993) for evaluation of the application usability and four elements (attention, relevance, confidence, and satisfaction) of the ARCS Motivational Model (Keller, 2010) for evaluating the user's motivation. ADDIE model (Gagne et al., 2005) was implemented throughout the phases. Figure 1.2 illustrates the theoretical framework of this study.

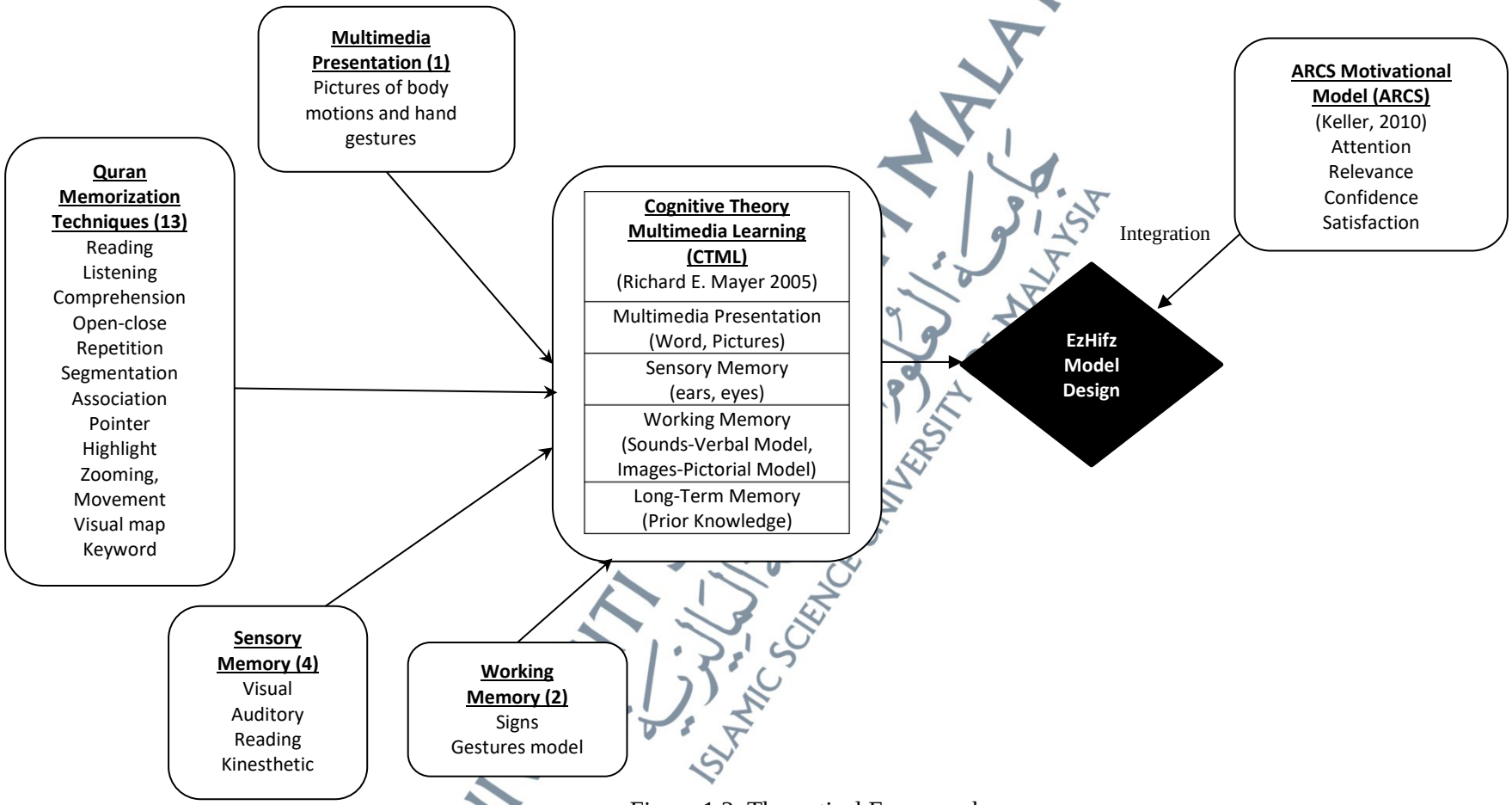

Figure 1.2: Theoretical Framework

1.11 Conceptual Framework

The conceptual framework of this study is the procedure of steps taken to conduct the entire research, with the related theories and models. It is constructed to help researchers to make an action more regular for the design and development (Zakaria & Abdul Nasir, 2020) of systematic processes based on stages. The research conducted is a study on a model of Quran memorization techniques based on the VARK learning style (EzHifz model) for memorizing the Quran. The framework highlighted the theory and models behind the design and development of EzHifz as a supportive tool that can motivate students in memorizing Quran. Based on the problem statement of the study, the main objective of the study is to identify the elements model for the Quran memorization technique based on VARK learning style and implement the design model of the Multimedia Representation Learning through the application prototype. This serves to contribute to the body of knowledge in the multimedia design technology field by developing a multimedia representation learning model for Quran memorization techniques based on VARK learning style (EzHifz model) for the Quranic. Figure 1.3 summarizes the conceptual framework that shows the whole process for this study.

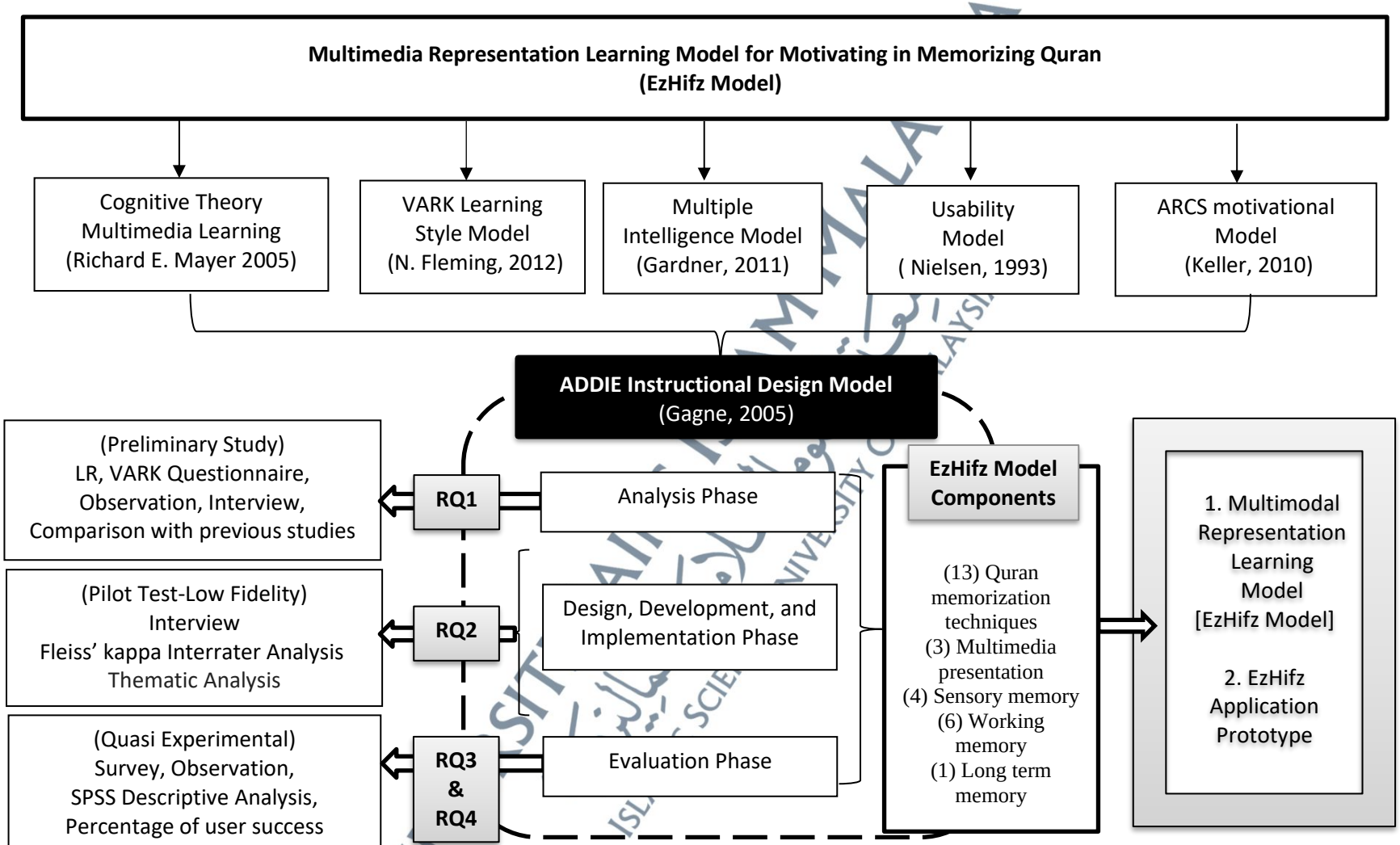

Figure 1.3: Conceptual Framework

This study consisted of three main phases, namely the analysis phase, design, development, and implementation phase as well as the evaluation phase. This research applied the ADDIE instructional design model (Gagne et al., 2005). In the analysis phase, the literature review was performed on the Cognitive Theory of Multimedia Learning (CTML) by Richard E. Mayer (2005). The conceptual frameworks employed Mayer's Theory as the foundation theory and concept for this study with other three models of the VARK Learning Style model (Fleming, 2012), the Multiple Intelligence model (Gardner, 2011), and the ARCS motivational model (Keller, 2010) as it was the most suitable theory and model that focused on a human memory system that encourages students to develop coherent mental representations and to understand the information learned using sensory modalities to build new knowledge using the principles of multimedia design based on VARK learning style. The literature review and comparison with previous studies were performed to find the appropriate elements of the EzHifz model design for memorizing the Quran. This phase produced proposed elements of a multimedia presentation (pictures of body motions and hand gestures), memory sensory (visual, auditory, reading, kinesthetics), working memory (signs, gestures model), and Quran memorization techniques (reading, listening, comprehension, open-close, repetition, segmentation, association, pointer, highlight, zooming, movement, visual map, keyword). The ADDIE model was applied in this analysis phase to guide researcher for the requirement analysis of the study. The results of literature review are the direction to answer the research questions of this study. The results of this phase are discussed in Chapter 5.

In the design, development, and implementation phase, the conceptual framework also included the models and approaches adapted to guide the design and

development. The proposed elements of a multimedia presentation (pictures of body motions and hand gestures), memory sensory (visual, auditory, reading, kinesthetics), working memory (signs, gestures model), and Quran memorization techniques (reading, listening, comprehension, open-close, repetition, segmentation, association, pointer, highlight, zooming, movement, visual map, keyword) was used in the second phase for designing the EzHifz model design. In addition, the ARCS motivational model design (Keller, 2010) was also incorporated into the fidelity EzHifz model design. The prototyping technique (low fidelity to high fidelity) was implemented as the main tool in designing the EzHifz model and EzHifz application prototype. The results of this phase are discussed in Chapter 4.

Finally, in the evaluation phase, the EzHifz prototype was evaluated in the aspect of usability and motivation. The related models applied were Nielsen's usability model (Nielsen, 1993) used to measure the usability of the application, and the ARCS motivational model (Keller, 2010) to evaluate user motivation. The results of this phase are discussed in chapter five. This phase is to achieve the third objective (see Chapter 1), to validate the design model of the Multimedia representation learning model (EzHifz model) by evaluating the usability of application prototype and user's motivation.

Overall, the conceptual framework aimed at illustrating how the objectives of the study were achieved by connecting the elements of theories and models in the framework to design the EzHifz model for memorizing the Quran and developing the EzHifz application prototype. The design and development of Quran memorization techniques based on the VARK learning style (EzHifz model) were to serve a student

as a supportive tool to memorize the Quran and motivate them to continuously memorize the Quran.

1.12 Operational Definitions

Some definitions of related terms used in this study are:

1.12.1 Multimedia

Multimedia is a combination of more than one media type of visual and audio representations that represent elements of the text (alphabetic or numeric), symbols, images, pictures, audio, video, and animations usually with the aid of technology to enhance understanding or memorization (Guan et al., 2018; R. Mayer, 2005; R. E. Mayer, 2017)

1.12.2 Multimedia Design

Multimedia design is the association of two forms of media that can include any combination of visual, audio, text, pictorial, and animation (Vaughan, 2014)

1.12.3 Multimedia Instructional

Multimedia instructional refers to presenting words and pictures that are intended to foster learning (Mayer, 2019). The words can be in a spoken form of narration or printed form namely onscreen text. The pictures can be in a static form namely illustrations, diagrams, maps, or photos, or dynamic forms namely animation or video. Some common uses of multimedia in e-learning include animation, video, or static graphics with accompanying narration; an animation, video, or static graphic with accompanying

onscreen text; or a computer-based interactive game, simulation, or activity that includes spoken or printed text (Mayer, 2017). .

1.12.4 Memory

Memory involves recalling various kinds of knowledge that allow people to act appropriately. A filtering process is used to decide what information gets further processed and memorized. Initially, encoding takes place, determining which information is paid attention to in the environment and how it is interpreted. The extent to which it takes place affects people's ability to recall that information later. The more attention that is paid to information and the more it is processed in terms of thinking about it and comparing it with other knowledge, the more likely it is to be remembered. Thus, how information is interpreted when it is encountered greatly affects how it is represented in memory and how easy it is to retrieve subsequently (Wang, 2020).

1.12.5 Memorization

Memorization is one of the pedagogies in learning, which is a mental process that emphasizes meaningful experiences, storing and reproducing those experiences when needed to solve a problem. Memorization also means to preserve, remember, take care of, and control what has been learned from being forgotten or damaged so that it is not lost (Sulaiman, 2018).

1.12.6 Universal Design

Universal design is focused on diversity and choice for the user and is applied to all design disciplines, including those that focused on built environments, products, and communications. The principles were intended to guide the design process, allow

systematic evaluation of designs, and assist in educating both designers and consumers about the features of more usable design purposes (Padden et al., 2017; Wolfgang F. & Korydon H., 2011)

1.12.7 Interaction Design

Interaction design is concerned with designing interactive products to support the way people communicate and interact in their every day and working lives. Interaction design is to develop interactive products that are usable. By this, we mean products that are generally easy to learn, effective to use and provide an enjoyable user experience (Sharp et al., 2019).

1.12.8 Usability

The International Organization for Standardization (ISO) 9241-11 (1998) defines usability as when a product can be used by a particular user to achieve a specific goal effectively, and efficiently achieving user satisfaction. Usability is a qualitative attribute that describes the extent to which a product or application is easy to use. Usability also refers to the user interface, improving ease of use during the design process, and accessibility during and after product implementation (Pinto-Corredor et al., 2021). Usability testing can ensure that the product design can be used by the target users. Therefore, user requirements and user interface issues must be considered in all phases of design and development to ensure that new products are easy to learn and easy to use (Petersen et al., 2019).

1.12.9 Quran memorization (Per Word) Course

Quran memorization (Per Word) is a course offered at the location study. This course provides the memorization methodologies and techniques for memorizing the Quran word-by-word and entire verses with their translations. The Quran memorization methodology implemented includes the memorization technique (Per word) using a conventional approach. Two types of *mushaf* are used in the learning process as a learning material in the classroom.

1.13 Thesis Structure

This thesis consists of six chapters. Chapter 1 presents the synopsis of the thesis including the research background, problem statement, research objectives, research questions, hypothesis, significance of the study, scope of the study, research framework, theoretical framework, conceptual framework and operational definitions. Chapter 2 reviews the relevant literature of the studies and develops the theoretical and conceptual framework. Chapter 3 elaborates on the research methodology including research design, data collection techniques, sampling, instruments, reliability, quasi-experimental, and research procedure. Chapter 4 elaborated on the model of Multimedia representation learning model (EzHifz model) and the development processes of the EzHifz prototype consisting of three phases of the ADDIE model. Chapter 5 explains the findings and data analysis of the research with quantitative data supported by qualitative data. Chapter 6 summarizes the research with a discussion, implications, research contribution, recommendations for future research, and conclusions.

1.14 Conclusion

This chapter has discussed the research background, problem statement, research objectives, research questions, and hypothesis. The significance of the study, scope, research framework, theoretical framework, conceptual framework, operational definitions, thesis structure, and conclusion will also be discussed in this chapter study. This study develops the model of multimedia representation learning (EzHifz model). The model developed is designed to use multiple senses of memory that support individual differences through a combination of four modes of VARK learning styles. Although there are various Quran memorization applications in the market, most of them are not designed to support the integration modes of the VARK learning style with an effective memorizing technique in the multimedia design model. Therefore, this study is to develop a model that enables students to choose an appropriate VARK learning style according to their preferred VARK learning style in the process of memorizing the Quran using interactive multimedia technology approaches. The next chapter will describe the literature review of this study.