CHAPTER 5

FINDINGS AND DATA ANALYSIS

5.1 Introduction

This chapter discusses the findings of the study based on the objectives and methodology of the study which has been implemented. Items discussed included developing a Multimedia representation learning model (EzHifz), EzHifz prototype, and evaluation of the EzHifz prototype that represents the Multimedia representation learning model (EzHifz) based on usability and motivation. The usability assessment aspect refers to the two main parameters tested learnability and user satisfaction. While the motivation assessment aspect refers to the four main parameters tested are attention, relevance, confidence, and satisfaction. This evaluation is based on the findings and data analysis obtained from an experimental study involving twenty (20) students.

5.2 EzHifz Model

The EzHifz model or Multimedia representation learning model (EzHifz) was developed by adapting elements in the Cognitive Theory of Multimedia Learning (CTML that can be used to memorize the Quran. The result of the analysis phase was to answer the first (1) research question for this study *RQ1: What are the appropriate multimedia representation learning model elements for Quran memorization techniques based on VARK learning style?*

The initial process of this analysis is to identify the EzHifz model design elements used to adapt Mayer's model or Cognitive Theory Multimedia Learning (CTML) (Mayer, 2005) from the previous studies. To choose the relevant EzHifz model design elements,

the papers nearly related to multimedia and memorization techniques were analyzed. The analysis of the EzHifz model design elements was explained in detail and summarized in Chapter 2. Based on the result from the selected papers, the elements selected have the potential to be applied in designing the EzHifz model. EzHifz model design elements will lead to benefits from the Quran memorization methodology in the aspect of memorizing techniques based on VARK learning style which can assist to motivate students in memorizing the Quran. The adapted elements of Mayer's model have been identified that suitable for the EzHifz model design, which is Quran memorization techniques (reading, listening, pointer, highlighting, keyword, visual map, association, zooming, comprehension, open-close, repetition, segmentation, movement), multimedia presentation (pictures of body motions and hand gestures), sensory memory (visual, auditory, reading, kinesthetics) and working memory (signs, gestures model). These elements were then integrated and evaluated in the context of the usability of the application and user motivation in memorizing the Quran. The process of integrating elements of the EzHifz model design needs to be completed from the beginning of the phase, throughout the development and evaluation process. Figure 5.1 shows the EzHifz model.

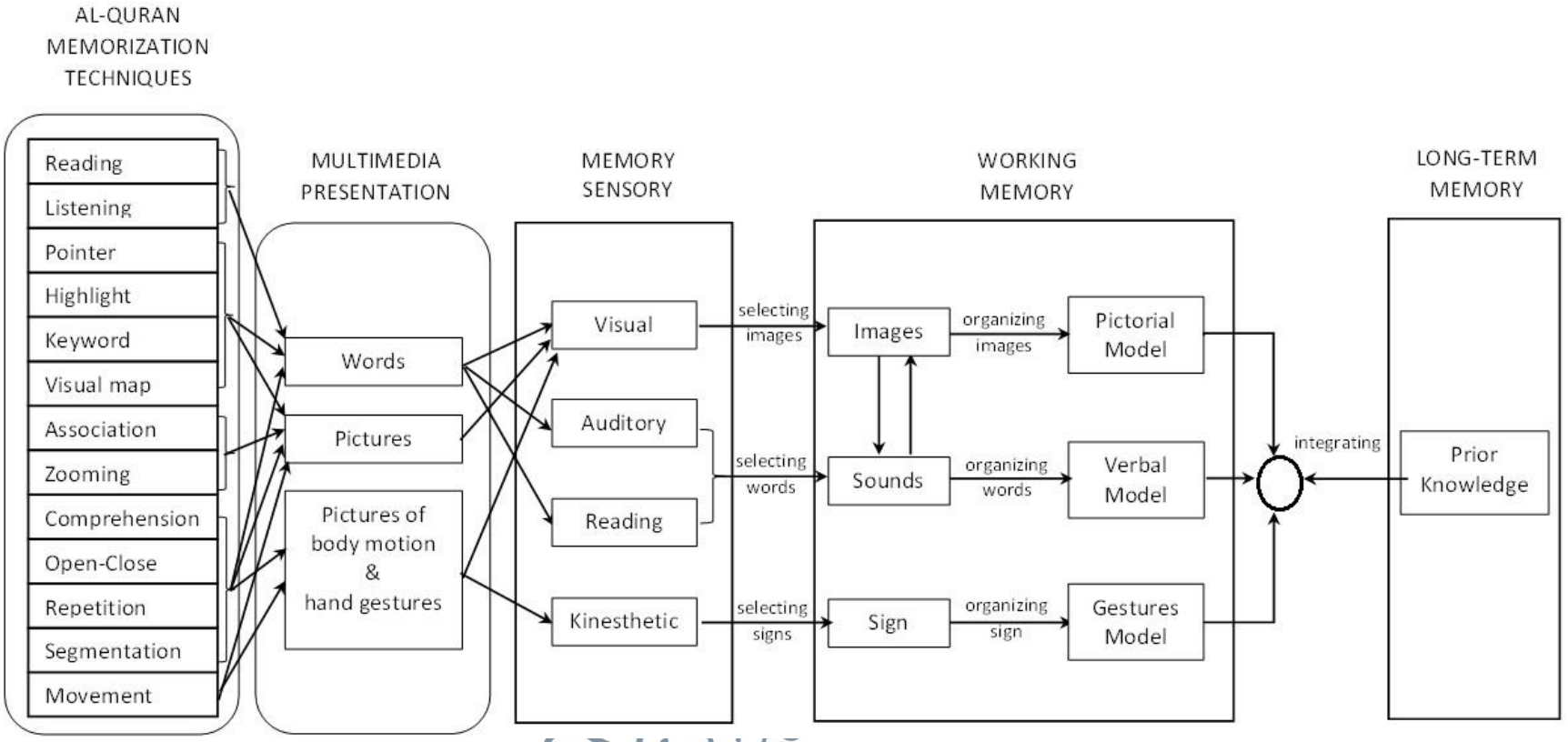


Figure 5.1: EzHifz Model

5.3 EzHifz Prototype

The existing components in Mayer's model are multimedia presentation, sensory memory, working memory long term memory. The EzHifz prototype represents the EzHifz model that adapts elements in Mayer's model with some modifications. Furthermore, the EzHifz prototype is described in detail:

5.3.1 Prototype of EzHifz model for Memorizing the Quran

Prototyping is a part of the development phase that involves designing the behavior of interactive products (Sharp et al., 2019). The most effective way for users to evaluate such designs is through interaction with them. This can be achieved through prototyping which can identify the problems in the early stages of design, and through role-playing of users with the product development. It also refers to both physical and digital representations of a design, regardless of low fidelity, that can be classified as a stage of the design process; they can also be described as a tool for further product development (Hussain et al., 2017).

The prototype of the EzHifz model was employed in the android mobile application platform. The EzHifz prototype for memorizing the Quran was implemented based on the elements of the EzHifz model which are Quran memorization techniques (open-close/hide-show, repetition, segmentation, association, pointer, highlight, zooming, movement, visual map/mind map, keyword, reading, listening, comprehension), multimedia presentation (pictures of body motions and hand gestures), sensory memory (visual, auditory, reading, kinesthetics) and working memory (signs, gestures model). Briefly, the final EzHifz model design was developed through low-fidelity EzHifz model design and EzHifz prototype. The fidelity of a prototype refers to

the degree of exactness to convey the look and feel of the final product. It is the most suitable to be used for the EzHifz model design to satisfy the user's needs and motivate them to memorize the Quran. The iterative process built in the EzHifz prototype development is important because the first iteration process enables the prototype to be evaluated with all the elements and functions that are seamlessly integrated. The process was implemented iteratively to produce a prototype that meets the needs and requirements of the users. The learning approach used in the EzHifz prototype is drilling and demonstrations that incorporate the concept of VARK learning styles, which strengthen the four modes of learning are visual, auditory, reading, and kinesthetic with an appropriate Quran memorization technique.

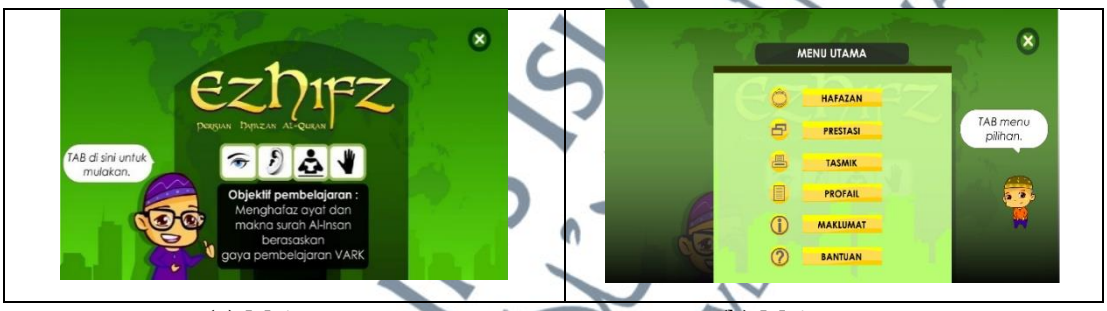
5.3.2 Interface Design of EzHifz Prototype

The interface of the EzHifz prototype is designed with a non-linear method to allow the students to select the main menu developed. The application architecture refers to how best to structure information at the interface level to enable users to navigate and access it easily and quickly (Sharp et al., 2019). In this study, interactivity in the memorization menu is formed in a linear method at the beginning of the Quran memorization process, to allow the students to relate to the right arrangement of the Quran verses in the text of *surah* incorporated; besides, the continual repetition process is formed with a non-linear method to enable the students to choose their preferred learning sequence in the memorization module provided. Instead of burdening the students' cognitive abilities, a visual map is used to ensure that the memorization process is organized and linked to each verse in the form of keywords and pictures (symbols); hence, all the verses can be memorized quickly and efficiently. All four modes of learning are included in the application developed to provide the students with

the selection of modes of learning based on their preferred VARK learning style. The selection of the preferred VARK learning style gives the students the ability and confidence to acquire knowledge using a variety of senses.

a) Main Page and Main Menu Interface

The VARK memorization module starts with the main page and then the main menu page as shown in Figure 5.2. There is a description of the EzHifz prototype that consists of the name of the application and clearly stated the learning objective on the main page. According to Kasem & Farah, (2020), mention that an effective strategy of learning needs to consider content that is clearly stated with learning objectives in digital technology. The main menu provides the user with a selection of menus.



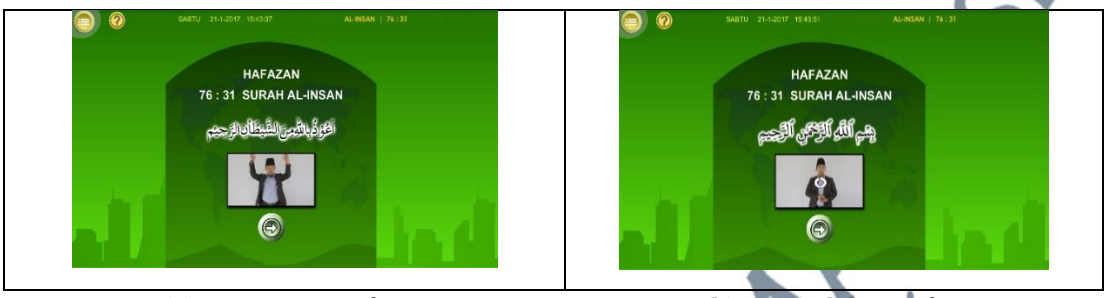
(a) Main page (b) Main menu page

Figure 5.2: Main page and Main menu Interface

b) *Taawuz* and *Basmalah* Interface

The *ta'awuz* and *basmalah* interface is shown in Figure 5.3 (a) and (b). These two interfaces applied the kinesthetics mode of learning style to memorize with movement technique and repetition technique. Studies by Hwang et al., (2020); Stanković et al., (2018); F. Wang et al., (2019) believed that learning and solving problems using the concept of a bodily-kinesthetic intelligence, integrating into course material using body movement would be more beneficial to the learners. It is generally

known that the motor area of the brain is activated by actions or movement through the kinesthetic channel once the learner memorizes the Quran.



(a) *Ta'awuz* Interface (b) *Basmalah* Interface

Figure 5.3: *Ta'awuz* and *Basmalah* Interface

c) Visual map Interface

The visual map interface is shown in Figure 5.4. This interface consists of icons that represent the keyword of text and image of verse from *Surah Al-Insaan*. It provides clear navigation of the Quran verses next to each other by using icons. This may help the user to navigate and select any verses that he or she wishes to start or continue from the previous session. The icons in the visual maps contain keyword technique that combines words and keyword images. The keyword words use a prefix or the beginning of each verse, while the image is a selection of illustrations that represent the verse memorized. The main purpose of designing this way is to promote easy recall and retention of the verses in the memory. It may help the user to recall and retain the Quran memorization through organizing and linking one verse to the next verse in their memory. According to Kotob et al., (2016) mind maps present information and data in a visual format that many of the previous scholars of the technique claim can increase the ability to retain information (Al-Mosallam, 2013; Buzan, 2005). The user is required to memorize each of the verses from the VARK memorization interface, to ensure that the visual map interface can be used easily and effectively. In addition to the keyword

of text and images, there is a *surah* number with the verse number and the abbreviation format number of the Quran. For example, in 7:31, 7 represents the *surah* number, while 31 represents the verse number. The users are required to memorize sequentially each of the verses in the icons developed to ensure that they remember the sequence of the verses well. The learning sequence is only assigned to the user who uses it for the first time. While repeating the use of verse in icons for the second time and so on, the user is allowed to reach any of the verse in icons provided randomly or sequentially, depending on their needs. A performance indicator is also provided in this visual map interface with the color indicators after the evaluation session by the teacher.

Figure 5.4: Visual map Interface

d) VARK Memorization Interface

The VARK Memorization Type 1 and Type 2 as shown in Figure 5.5, were developed in two different types of visual mode presentations. Only the parts of the visual mode presentations change with colored objects or the color of pictures to facilitate memorization with easy visualization of the Quran verse and translation. The VARK memorization interface is uniquely designed with four modes of the VARK learning styles in one interface for each number of verses from *surah Al-Insaan* with its translation. The user is required to complete the process of memorizing each of the

numbered verses sequentially for the first time before moving to the next verse number. While repeating each of the verses for the second time and so on, the user is allowed to access it randomly or sequentially depending on his or her needs.

(a) VARK Memorization (Type 1) (b) VARK Memorization (Type 2)

Figure 5.5: VARK Memorization

Based on Figure 5.5:, the elements of the EzHifz model were applied within the VARK memorization interface and its sub-interface. This interface has four main areas that apply the modes of learning based on the VARK learning styles. The upper right corner shows the auditory mode style representing the sound mode, while the upper left corner shows the kinesthetic mode style which represents the video mode. The visual mode style represents the use of graphical images or pictures shown in between the auditory and kinesthetic modes. Finally, the middle area of the VARK memorization interface shows the reading mode style represented in Arabic fonts of Quran verses as well as the translation written in the Malay language from *surah Al-Insaan*. The "play" button is the main function of using the VARK memorization interface which synchronized all modes of VARK learning style within the interface. The "previous" and "next" buttons allow the user to move to the desired verse of the *surah Al-Insaan*. Furthermore, the "visual map" button and "help" buttons are provided in each of the VARK memorization interfaces to facilitate the process of Quran memorization. This

application interface is consistent with the concept of multiple sensory modalities in the multiple intelligence theory (Gardner, 2011); the more modalities are involved in designing the learning content using materials, the greater chance the user has to remember and improve their engagement of learning. Therefore, the interface is complemented by the multimedia presentation elements of pictures, audio, words, and video that utilize multiple sensory memory based on the user's preferred VARK learning styles.

The VARK memorization interface is integrated with memorizing techniques. This interface will display all the VARK learning modes (quadri-modality mode) when it is first loaded. Then, the user can freely select any of their preferred VARK learning styles (can be more than one mode of learning style) either uni-modality, bi-modality, or tri-modality mode by pressing the V, A, R, or K button on the right-hand side of the interface. The VARK button represents one of the memorizing techniques called the open-close technique, which allows the user to memorize the verse and its translation by opening and closing the modes alternately. This interface also provides the access to multiple sensory modalities through the selection of VARK learning style categories are uni-modality, bi-modality, tri-modality, and quadri-modality (Fleming, 2012) as discussed in Chapter 2.

The repetition technique is utilized in each mode of the VARK learning style. The Quran verses can be repeated using the playback and pause buttons provided by an auditory model. For each loop, the selected mode of learning style (either one or a combination of V, A, R, and K) will be played repeatedly. For the long verse, each of the multimedia presentations (pictures, audio, words, and pictures of body motions and hand gestures) employs the segmentation technique to break up the elements into at

least four small chunks (Blume et al., 2016; Schweppe & Rummer, 2013) to facilitate the memorization process.

The pointer, highlight, and zooming techniques are used to create the user's focus and attention to the multimedia presentation for the pictures of verses, Arabic and Malay words, audio, as well as pictures of body motions and hand gestures. This is in line with the concept of focus and attention presented in the research by (Allibaih et al., 2020; Chandler & Sweller, 1991; Schweppe & Rummer, 2013) that helps a user direct his or her cognitive resources to focus on the relevant information, integrating and encoding it in the long-term memory; in this manner, the brain will retain the information in the memory for a longer time. Moreover, the function of the pointer technique is also embedded with multiple functions to facilitate the memorizing process, through the play-pause button, counting the number of repetitions instead of pointing at the Quran verse in the Arabic text.

The open-close technique is activated through the VARK button in the VARK memorization interface, which gives the users an option to select their preferred or dominant VARK learning styles to memorize the *surah Al-Insaan*. The preferred VARK learning style was determined through the use of the VARK instrument introduced by Fleming, (2012). The next section will be discussed in detail each mode of VARK learning style applied in the VARK memorization interface.

i. Screen Design: VARK Memorization Menu – Visual Mode

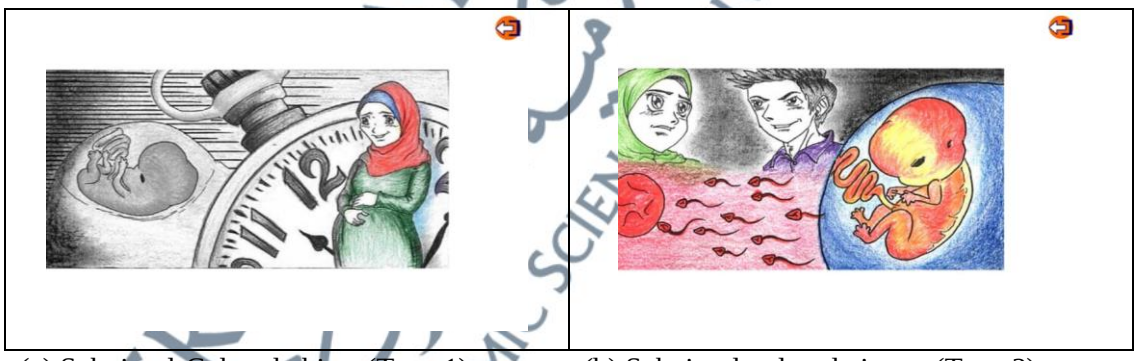
A pictorial model is produced from the pictures and pictures of body motion and hand gestures or video from the visual mode interface. It is displayed as pictures of drawing provided in the form of colored objects or colored pictures that give the translation of a *surah Al-Insaan*. There are two (2) types of visual mode displays used in the VARK

memorization interface: first, the segmentation technique combined with the association technique with a colored object (Type 1) is as shown in Figure 5.6 (a); second, the segmentation technique combined with the association technique with a colored picture (Type 2) is as shown in Figure 5.6 (b). The representation of an object or picture in two or three frames of segmentation serves to reduce the cognitive load and ease the memorization of the Quran verses and translations. It is recognized through the changed color in each frame developed. Thus, selecting objects or pictures, known as the visual keyword technique, is also utilized in the visual map interface, for the users to memorize, recall and retain information in the memory effectively. Simple and recognizable objects and pictures that can be easily memorized are developed to represent the visual keywords, which may help the users in the Quran memorization. The user's attention is drawn to the objects or pictures provided on the visual map interface, and they use them as a clue or prompter to recall the memorized verses and translations or to retain the memorization in their memory. This is consistent with the concept of visual imagery (Reed, 2012) in the cognitive theory, that a user can remember and understand more effectively when information is presented in the form of images. The VARK memorization interface also allows the users to select a combination of visual mode and auditory mode so that they can listen to the audio as well as recognize the colored objects or pictures displayed. Thus, a visual illustration supported by auditory information may improve the users' memorization and comprehension by reducing their cognitive load (Lee et al., 2019a; Plass et al., 2010).

(a) Colored object (Type 1) (b) Colored picture (Type 2)

Figure 5.6: Types of Visual mode of learning

The visual mode provides a submenu visual mode, that integrates the zooming technique and the association technique with colored objects as shown in Figure 5.7 (a). The submenu visual mode that has a function integrating the zooming technique and the association technique with colored pictures is shown in Figure 5.7 (b). The zooming features are utilized in many application types of research to provide the function of close viewing, and additional display of space for managing the application pages (Byrne et al. 2010; Ghembaza et al. 2018; Katsuhisa et al. 2010).



(a) Subvisual-Colored object (Type 1) (b) Subvisual-colored picture (Type 2)

Figure 5.7: Types of Sub-Visual mode of learning

ii. Screen Design: VARK Memorization Menu – Auditory Mode

The verbal model utilized in the VARK memorization interface to generate the audio of verses and translations through clicking the "play" button is shown in Figure

5.8. The "play & pause" button in the area of reading mode can also be used to control the usage of the auditory mode. The segmentation or chunking technique of audio is integrated with the reading mode to facilitate the memorizing of long Quran verses and translations. The audio repetition of the segmented s*urah Al-Insaan* verses can be triggered by clicking any area of the Quran verse or Arabic text and the Quran translation or Malay text displayed. Thus, the modality principle (Moreno & Mayer, 1999) applies in this auditory mode; the words are presented in auditory form rather than visual or visual on-screen text.

Figure 5.8: Auditory Mode of Learning

iii. Screen Design: VARK Memorization Menu – Reading Mode

The reading mode utilized in the VARK memorization interface as a display of verses and translations is shown in Figure 5.9. This model provides a button with three functions. Firstly, a counter indicator displays the number of repetitions read or memorized by the user. Secondly, a pointer technique facilitates focusing and attracting attention while the user is reading the verse of the Quran. Thirdly, a "play & pause" button allows the user to read or replay the reading mode. In the area of the Quran verse or Arabic text of the *Surah Al-Insaan*, the user can launch the segmentation technique integrated with the auditory mode by clicking any area of the Quran verse or Arabic text while playing the audio. In the area of Quran translation or Malay text of the *Surah*

Al-Insaan, the segmentation technique in combination with the highlight technique can be activated by clicking the chunking of the Quran translation displayed. This is in line with the concept of verbal rehearsal (Reed, 2012) or active rehearsal (Ali et al., 2019) in the cognitive theory that users can remember and understand more effectively when orally presented information is heard. The reading mode is developed so that the user can adapt to the techniques of reducing the difficulty of memorizing, recalling, and retaining the long verse or translation in the process of memorizing the Quran.

Figure 5.9: Reading mode of Learning

iv. Screen Design: VARK Memorization Menu – Kinesthetic Mode

The gestures model is developed based on the video recording of movement techniques with consistent signs of body motions and hand gestures; it is shown in Figure 5.10. The movement technique in the video is combined with the auditory mode; the user needs to repeat the "play button" to execute the movement technique that produces the image of an object, representing the Quran verse and translation of the *Surah Al-Insan*. The function of the "play button" is useful for repeating activities in all the modes using multiple sensory memory abilities of learning, to improve information retention in the working memory and long-term memory (Wang, 2018).

Figure 5.10: Kinesthetic mode of Learning

The Kinesthetics mode provides a sub-kinesthetics that facilitates the user with step-by-step pictures of body motions and hand gestures, which are integrated with the segmented Quran verses or Arabic text, as shown in Figure 5.11. This is consistent with the concept of the contiguity principle introduced by Moreno & Mayer (1999), which stated that the cognitive principles of multimedia learning help a user to memorize information easily because it is presented near each other on the screen or page. Studies by Lee et al., (2019); Mousavi et al., (1995); Schroeder & Cenkci, (2018) stated that learner learns more when related words and pictures are displayed spatially near one another. Research has shown both effects to influence learning. For Cognitive Theory Multimedia Learning (CTML), Clark & Mayer, (2016); Mayer, (2003) defines multimedia as learning through both verbal and pictorial representations and related research has shown that learning from multimedia can be more effective than learning from words only. For this study, the gestures model is an adapted element of the Kinesthetics mode in Mayer's model as multimedia learning through video or pictures of body motions and hand gestures that represent learning in sign language.

Figure 5.11: Sub-Kinesthetic mode of Learning

After completing the pilot study (see Chapter 4) and testing, the improvements have been made based on the student's feedback. Then, the EzHifz prototype that represents the EzHifz model was evaluated in the evaluation phase among students aged 10-15 years in *Tahfiz* Integration School, Sepang Selangor.

5.4 Evaluation of the EzHifz Model

The evaluation of the EzHifz model through the EzHifz prototype was performed after conducting the expert validate the content validity in the design and development phase. The amendment and improvement have been implemented through the experimentation process. This evaluation was conducted during the evaluation phase involving twenty (20) students at *Tahfiz* Integration School in Sepang Selangor. The goal of the evaluation is to find out whether the EzHifz model through the use of the EzHifz prototype has answered the research question and achieved the research objectives. This section presents the results from the survey and observation in the quantitative and qualitative parts as well as a hypothesis to answer the third and fourth research questions on the feedback of usability (learnability, user satisfaction) and motivation (attention, relevance, confidence, satisfaction) of the EzHifz prototype for motivating the student to memorize the Quran.

5.4.1 EzHifz Model Metric

This study used the usability of the application and user motivation approaches to evaluate the EzHifz prototype that represents the EzHifz model design. Research studies by Keller, (2010, 2016), mentions that the evaluation can adapt the elements provided in the ARCS motivational model design based on the suitability of the model development. For this study, the researcher has developed evaluation metrics that can evaluate the EzHifz prototype in the aspect of usability of the application (learnability, user satisfaction) and user motivation (attention, relevance, confidence, satisfaction). This questionnaire was modified and adapted from the previous researcher according to the suitability of this study (Abu et al., 2007; Fatimah et al., 2019; Norizah et al., 2014; Shaharuddin et al., 2012).

5.4.2 Research Respondent Profile

The EzHifz prototype evaluation was conducted among 20 students aged 10-15 years as a respondent to this study. The profile of respondents includes gender, age, academic level, number of years of experience memorizing the Quran, and basic knowledge of using IT devices (smartphones or tablets). Table 5.1 shows the profile frequency and percentage of respondents in this study. Gender findings indicated that 40 percent of male respondents (n = 8) and 60 percent of female respondents (n = 12). The age ranges from 10 to 15 years, From the 20 respondents, 70 percent (14) were between 10 and 12 years; 30 percent (6) were between 13 to 15 years.

Table 5.1: Research Respondent Profile

Item		Frequency	Percentage (%)
Gender	Male	8	40
	Female	12	60

Age	10-12 13-15	14 6	70 30
Academic levels	Standard 6 (with UPSR) Standard 6 (without UPSR)	13 7	65 35
Experience in memorizing Quran (Per word)	< 1 year 1-2 years >2 years	2 15 3	10 75 15
Skill using IT devices (Smartphone or tablet)	Skilled Not skilled	20 0	100 0

From the aspect of academic levels background, the findings show that 65 percent of students are standard 6 with UPSR while 7 percent in from standard 6 without UPSR. The highest percentage of respondents were experienced in memorizing Quran (Per word) for 1-2 years at 75 percent, followed by greater than 2 years with 15 percent and less than 1 year at 2 percent. All students have a skill in using IT devices (smartphones or tablets). Moreover, this evaluation phase also considers a learning experience in memorizing the Quran based on their preferred VARK learning style while using the application. Table 5.2 shows the distribution of the VARK learning style categories and Figure 5.12 shows the strengths of the student's preferences in the VARK learning style. The age ranges between 10 to 15 years, From the 20 respondents, 40 percent (8) were uni-modality, 15 percent (3) were bi-modality, 10 percent (2) were tri-modality and 35 percent (7) were quadri-modality.

Table 5.2: Distribution of VARK Learning Style Categories

Age	Uni-modality	Bi-modality	Tri-modality	Quadri-modality
10-12 years	8	1	1	5
13-15 years	0	2	1	2
Frequency	8	3	2	7
Percentage (%)	40	15	10	35

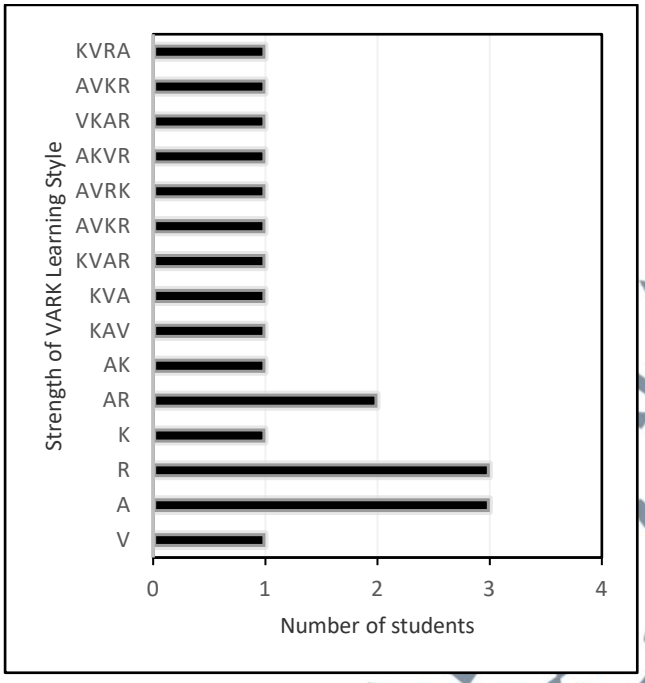


Figure 5.12: Distribution of the Strength of the VARK Learning Style

5.5 Finding of Discussion on Survey

Evaluation of the EzHifz model is made through the testing of a developed prototype. Two aspects of the evaluation of the EzHifz prototype were conducted usability of the application and user motivation in memorizing the Quran. The mean score interpretation of the usability and motivation is shown in Table 5.3.

Table 5.3: Interpretation of the Score

Value Mean Score	Interpretation Level
4.01-5.00	High
3.01-4.00	Medium-High
2.01-3.00	Medium Low
1.01-2.00	Very Low

Source: (Taormina & Gao, 2013)

The following are the findings of the EzHifz prototype that represents the EzHifz model for memorizing the Quran from the survey method (quantitative).

5.5.1 Usability of EzHifz Prototype

The evaluation of the EzHifz model is made through the evaluation of the application or prototype developed. The evaluation of the EzHifz model is seen from the aspect of usability of the application prototype (learnability and user satisfaction) as a learning aid. The usability elements evaluated are learnability (15 items) and user satisfaction (10 items). In the instrument, there are twenty-five (25) items constructed in usability construct to obtain information from the respondents of the study related to the learnability and user satisfaction in the prototype developed. Table 5.4 shows the frequency distribution, percentage, mean, standard deviation, and interpretation level of each item for usability application. Twenty-five (25) items in the aspect of usability indicate the mean of each item is at a high mean level of interpretation (4.01- 5.00) and only one item is in the medium-high mean level of interpretation (3.01-4.00) based on the mean score interpretation level (Taormina & Gao, 2013) (see Table 5.3). The total mean for usability is mean = 4.33 (standard deviation of 0.689) is a high level.

Table 5.4: Analysis of Evaluation on Usability of EzHifz Application Prototype

Item	Learnability Metric	SD F %	D F %	U F %	A F %	SA F %	Mean	*SD*	Level
B1	EzHifz application trains users to memorize verses using a visual learning style mode by looking at the pictures of verses and the translation of *Surah Al-Insan*.	0 0	0 0	0 0	8 40	12 60	4.60	0.503	High
B2	EzHifz application trains users to memorize verses using auditory learning style mode through listening to the audio of verses and the translation of *Surah Al-Insan*.	0 0	0 0	4 20	8 40	8 40	4.20	0.768	High

B3	EzHifz application trains users to memorize verses using reading learning style mode through words of verses and the translation of *Surah Al-Insan*.	0 0	0 0	1 5	12 60	7 35	4.30	0.571	High
B4	EzHifz application trains users to memorize verses using kinesthetic learning style mode with body motions and hand gestures of verses and the translation of *Surah Al-Insan*.	0 0	2 10	5 25	8 40	5 25	3.80	0.951	Medium-High
B5	EzHifz application trains users to memorize verses using one or more of the VARK learning style modes.	0 0	0 0	0 0	12 60	8 40	4.40	0.503	High
B6	EzHifz's application teaches me the technique of memorizing the Quran verses using the VARK learning style.	0 0	1 5	5 25	2 10	12 60	4.25	1.020	High
B7	Visual map trains users to use keyword techniques in the form of words and pictures to help them memorize *Al-Insaan* verses and their translations.	0 0	0 0	0 0	5 25	15 75	4.75	0.444	High
B8	The VARK button on the EzHifz application trains users to use the open and close technique in memorizing *Surah Al-Insaan* verses and translations.	0 0	0 0	0 0	8 40	12 60	4.60	0.503	High
B9	EzHifz application trains users using the association technique of the colored objects in one picture to assist in the process of memorizing Quran verses and translation.	0 0	0 0	4 20	9 45	7 35	4.15	0.745	High
B10	EzHifz application trains the user to memorize using zooming techniques of pictures to represent	0 0	0 0	0 0	10 50	10 50	4.50	0.513	High

	the verse and translation of the Quran.								
B11	EzHifz application trains users to memorize the segmentation of objects and images representing Quran verses.	0 0	1 5	4 20	5 25	10 50	4.20	0.951	High
B12	EzHifz application trains users to memorize by repeating segments of translation in the words of reading.	0 0	0 0	5 25	7 35	8 40	4.15	0.813	High
B13	EzHifz application trains users to memorize through a segmentation technique of pictures body motions and hand gestures.	0 0	0 0	3 15	9 45	8 40	4.25	0.716	High
B14	EzHifz application trains users to use the segmentation technique for the words, pictures, audio as well as body motions, and hand gestures in memorizing Quran verses and translation.	0 0	0 0	1 5	13 65	6 30	4.25	0.550	High
B15	EzHifz application allows users to memorize verses by repeating highlight techniques through the segmentation of words.	0 0	1 5	1 5	9 45	9 45	4.30	0.801	High
Total Mean (Learnability Metric)							**4.31**	**0.690**	**High**

Item	**User Satisfaction Metric**	**SD** **F** **%**	**D** **F** **%**	**U** **F** **%**	**A** **F** **%**	**SA** **F** **%**	**Mean**	***SD***	**Level**
C1	The interface of the EzHifz application is easy to operate.	0 0	0 0	4 20	9 45	7 35	4.15	0.745	High
C2	The video of the EzHifz application can be controlled to facilitate the learning process.	0 0	1 5	3 15	8 40	8 40	4.15	0.875	High
C3	EzHifz application provides users with the freedom to choose	0 0	0 0	1 5	11 55	8 40	4.35	0.587	High

	their preferred VARK learning style.								
C4	The navigation button in the EzHifz application gives the user the freedom to move to the desired interface.	0 0	0 0	0 0	12 60	8 40	4.40	0.503	High
C5	EzHifz application helps students repeat the verses independently	0 0	0 0	2 10	5 25	23 65	4.55	0.686	High
C6	EzHifz application interface design is user-friendly.	0 0	0 0	3 15	8 40	9 45	4.30	0.733	High
C7	Users enjoy the fun of learning in different environments according to their VARK learning styles	0 0	0 0	3 15	4 20	13 65	4.50	0.761	High
C8	The use of a graphical display or verse illustration speeds up the learning process of memorizing the Quran verses.	0 0	0 0	2 10	7 35	11 55	4.45	0.686	High
C9	EzHifz application is easy to use.	0 0	0 0	0 0	10 50	10 50	4.50	0.513	High
C10	Users can exit the EzHifz application at any time as needed.	0 0	0 0	4 20	7 35	9 45	4.25	0.786	High
Total Mean (User Satisfaction Metric)							**4.36**	**0.687**	**High**
TOTAL MEAN FOR USABILITY OF APPLICATION							**4.33**	**0.689**	**HIGH**

Table 5.4 shows the evaluation of the EzHifz prototype on the aspect of learnability and user satisfaction. In the aspect of learnability, the item with the highest mean was the item 'visual map trains users to use keyword techniques in the form of words and pictures with a mean = 4.75, sd = 0.444, and 75.0 percent of the respondents strongly agree. This is followed by the items of 'visual learning style mode by looking at the pictures and 'VARK button trains users to use the open and close technique' with mean=4.60, sd =0.503. The mean items of Quran memorization techniques with a mean less than 4.60 are 'zooming techniques of pictures' (mean=4.50,sd=0.513); 'using one or more of the VARK learning style modes' (mean=4.40,sd=0.503), 'repeating

highlight techniques through the segmentation of words' (mean=4.30,sd=0.801), 'reading learning style mode through words' (mean=4.30,sd=0.571), 'using the VARK learning styles' (mean=4.25,sd=1.020), 'segmentation technique of pictures body motion and hand gestures' (mean=4.25,sd=0.716), 'segmentation technique for the words, pictures, audio as well as body motions and hand gestures' (mean=4.25,sd=0.550), 'segmentation of objects and images' (mean=4.20,sd=0.951), 'auditory learning style mode through listening to the audio' (mean=4.20,sd=0.768), 'repeating segments of translation in the words' (mean=4.15,sd=0.813) and 'association technique of the colored objects in one picture' (mean=4.15,sd=0.745). However, only the item 'kinesthetic learning style mode with body motions and hand gestures' has a mean average of 3.80 and a standard deviation of 0.951. It was also the lowest mean item with 65 percent of respondents agreeing and strongly agreeing.

In the aspect of user satisfaction, the item with the highest mean was the item 'EzHifz application helps students repeat the verses independently' with a mean = 4.55, sd = 0.686, and 90.0 percent of the respondents agree and strongly agree. This is followed by the items 'users enjoy the fun of learning in different environments according to their VARK learning styles' with mean=4.50, sd =0.761, and 'EzHifz application is easy to use' with mean=4.50, sd =0.513. The mean items of Quran memorization techniques with a mean less than 4.50 are 'graphical display or verse illustration speeds up the learning' (mean=4.45,sd=0.686), 'freedom to move to the desired interface'(mean=4.40,sd=0.503), 'freedom to choose their preferred VARK learning style'(mean=4.35, sd=0.587), 'interface design is user-friendly' (mean=4.30,sd=0.733), 'can exit at any time as needed' (mean=4.25,sd=0.786) and 'video of the EzHifz application can be controlled ' (mean= 4.15,sd=0.875). However,

the item ‘interface of the EzHifz application is easy to operate’ has a mean of 4.15 and a standard deviation of 0.745, It was also the lowest mean item with 80 percent of respondents agreeing and strongly agreeing.

The total mean of the learnability aspect is 4.31 and has a standard deviation of 0.690 while the user satisfaction aspect is 4.36 with a standard deviation of 0.687 as shown in Table 5.5. This finding also shows the mean for the overall usability of the application was 4.33 with a standard deviation of 0.689. This finding is interpreted as high. This shows that this application has excellent usability in terms of learnability and user satisfaction. Almost each of the techniques applied in Quran memorization was used and suitable to be applied in memorizing the Quran based on the user’s preferred VARK learning style. Moreover, with an understanding of how the brain processes information, it is clear why the researcher wants to incorporate multimedia learning. In addition to explaining how the brain processes multimedia information, Cognitive Theory Multimedia Learning (CTML) explains how to best incorporate multimedia learning that applies the *EzHifz* model based on VARK learning style.

Table 5.5: Total Mean for Usability Application

Evaluation Metric	**Total Mean**	**Standard Deviation**	**Interpretation**
-Learnability	4.31	0.690	High
-User Satisfaction	4.36	0.687	High
Usability of Model	**4.33**	**0.689**	**High**

5.5.2 Motivation of user

The second component evaluation of the EzHifz prototype is seen by the motivational user from the aspect of attention, relevance, confidence, and satisfaction in using the application as a learning aid. The motivational elements evaluated are attention (14 items), relevance (15 items), confidence (15 items), and satisfaction (11 items). In the

instrument provided there are fifty-five (55) items constructed in the motivational aspect to obtain information from the respondents of the study related to the attention, relevance, confidence, and satisfaction through the application.

The frequency distribution, percentage, mean, standard deviation, and interpretation level of each item for motivation shows in Table 5.6. Fifty-one (51) items in the aspect of motivation indicate the mean of each item is at a high mean level of interpretation (4.01- 5.00) and only four items are in the medium-high mean level of interpretation (3.01-4.00) based on the mean score interpretation level (Taormina & Gao, 2013) (see Table 5.3). The total mean for motivation is 4.27 (standard deviation of 0.155) was also at a high level.

Table 5.6: Analysis of Evaluation of Motivation

Item	**Attention (A) Metric**	**SD F %**	**D F %**	**U F %**	**A F %**	**SA F %**	**Mean**	***SD***	**Level**
D1	The screen design is attractive.	0 0	0 0	1 5	5 25	14 70	4.65	0.587	High
D2	Memorizing is interesting by listening to an audio of Quran verses and translation using the EzHifz application.	0 0	1 5	3 15	8 40	8 40	4.15	0.875	High
D3	EzHifz application attracts students to memorize the Quran.	0 0	0 0	0 0	9 45	11 55	4.55	0.510	High
D4	The pictures of the EzHifz application attract the users to memorize the *Surah Al Insan*.	0 0	0 0	6 30	3 15	11 55	4.25	0.910	High
D5	The audio of the EzHifz application attracts users to	0 0	0 0	5 25	4 20	11 55	4.30	0.865	High

	memorize the *Surah Al Insan*.								
D6	The video of the EzHifz application attracts users to memorize the *Surah Al Insan*.	0 0	1 5	3 15	6 30	10 50	4.25	0.910	High
D7	The pictures used are interesting	0 0	0 0	2 10	9 45	9 45	4.35	0.671	High
D8	The visual maps of the EzHifz application attract users to memorize through arranging and connecting one verse to another.	0 0	0 0	2 10	12 60	6 30	4.10	0.788	High
D9	EzHifz's application has increased my interest in memorizing the Quran.	0 0	0 0	0 0	11 55	9 45	4.45	0.510	High
D10	I am interested in memorizing the Quran using the VARK learning style in the application.	0 0	0 0	0 0	11 55	9 45	4.45	0.510	High
D11	I am interested in memorizing the Quran verses and translations using the application.	0 0	0 0	3 15	5 25	12 60	4.45	0.759	High
D12	The use of the EzHifz application makes me interested in mastering the VARK learning style in memorizing the Quran.	0 0	0 0	5 25	4 20	11 55	4.30	0.865	High
D13	I intend to use the EzHifz application in memorizing the Quran.	0 0	1 5	9 45	1 5	9 45	3.90	1.071	Medium-High
D14	Memorizing Quran using body motions and hand gestures through	0 0	1 5	4 20	5 25	10 50	4.20	0.951	High

	video display can make my learning active and interesting.								
Total mean (Attention Metric)							**4.31**	**0.770**	**High**

Item	**Relevance (R) Metric**	**SD F %**	**D F %**	**U F %**	**A F %**	**SA F %**	**Mean**	***SD***	**Level**
E1	Clear words to read.	0 0	1 5	1 5	9 45	9 45	4.30	0.801	High
E2	EzHifz application content meets the syllabus of the Quran memorization (Per Word) course.	0 0	0 0	0 0	19 95	1 5	4.05	0.224	High
E3	Visual maps provide surah and verse numbers to facilitate students' ability to memorize the Quran.	0 0	0 0	3 15	9 45	8 40	4.25	0.716	High
E4	I find the EzHifz application has a selection of modes of VARK learning style.	0 0	0 0	0 0	14 70	6 30	4.30	0.470	High
E5	EzHifz application supports the user to memorize the Quran using a variety of senses namely eyes, ears, body motion, and hand gestures.	0 0	0 0	1 5	7 35	12 60	4.55	0.605	High
E6	EzHifz application provides support materials for the students.	0 0	0 0	4 20	6 30	10 50	4.30	0.801	High

E7	Controlled audio memorization in the EzHifz application facilitates memorization.	0 0	1 5	5 25	5 25	9 45	4.10	0.968	High
E8	The speed of content presentation in the EzHifz application can be controlled by the user.	0 0	1 5	3 15	13 65	3 15	3.90	0.718	Medium-High
E9	Visual maps provide icons of words and images of keywords that allow students to recall memorized verses.	0 0	1 5	2 10	9 45	8 40	4.20	0.834	High
E10	EzHifz application contains visual maps that help users to get an overview of the surah memorized.	0 0	0 0	4 20	9 45	7 35	4.15	0.745	High
E11	EzHifz uses all multimedia elements including pictures, words, audio, and video in the process of memorizing the Quran.	0 0	0 0	2 10	12 60	6 30	4.20	0.616	High
E12	EzHifz provides students with a function to memorize the Quran verses repetitively.	0 0	0 0	4 20	3 15	13 65	4.45	0.826	High
E13	The EzHifz is suitable for the needs of the users.	0 0	0 0	2 10	9 45	9 45	4.35	0.671	High
E14	EzHifz are suitable for memorizing the Quran.	0 0	0 0	5 25	3 15	12 60	4.35	0.875	High

E15	The content of the EzHifz is useful for memorizing the Quran.	0 0	2 10	2 10	7 35	9 45	4.15	0.988	High
Total mean (Relevance Metric)							**4.24**	**0.732**	**High**

Item	**Confidence (C) Metric**	**SD** **F** **%**	**D** **F** **%**	**U** **F** **%**	**A** **F** **%**	**SA** **F** **%**	**Mean**	***SD***	**Level**
F1	Visual maps make it easy for students to compose and link one verse to another.	0 0	0 0	2 10	12 60	6 30	4.20	0.616	High
F2	Knowing my right VARK learning style makes memorizing process effective and enjoyable.	0 0	0 0	1 5	3 15	16 80	4.75	0.550	High
F3	The selection of the VARK learning style in the EzHifz application reinforces my memorization in memorizing the Quran.	0 0	0 0	0 0	8 40	12 60	4.60	0.503	High
F4	I can use the EzHifz application on my own.	0 0	0 0	2 10	7 35	11 55	4.45	0.686	High
F5	EzHifz application can enhance my understanding of the translation of the Quran.	0 0	5 25	0 0	3 15	12 60	4.10	1.294	High
F6	The use of the EzHifz application improves my ability to memorize the Quran.	0 0	0 0	0 0	17 85	3 15	4.15	0.366	High
F7	The selection of the VARK	0 0	0 0	0 0	13 65	7 35	4.35	0.489	High

	learning style in the EzHifz application reinforces my understanding of memorizing the *Surah Al Insaan*.								
F8	EzHifz application has enabled me to easily identify the VARK learning styles that I am interested in.	0 0	0 0	0 0	12 60	8 40	4.40	0.503	High
F9	EzHifz application makes learning easier to memorize the Quran verses and translations.	0 0	0 0	3 15	5 25	12 60	4.45	0.759	High
F10	EzHifz application makes learning easier to master the Quran memorization.	0 0	0 0	1 5	13 65	6 30	4.25	0.550	High
F11	EzHifz application makes learning easier to memorize the words of the Quran.	0 0	0 0	1 5	13 65	6 30	4.25	0.639	High
F12	EzHifz application supports my VARK learning style.	0 0	0 0	5 25	10 50	5 25	4.00	0.725	High
F13	The technique of memorizing in the EzHifz application helps my memorization process.	0 0	0 0	0 0	8 40	12 60	4.60	0.503	High
F14	EzHifz application	0 0	0 0	5 25	14 70	1 5	3.80	0.523	Medium-High

	helps me master VARK's learning style in memorizing the Quran.								
F15	Learning to use a combination of graphics, text, sound, and video can speed up my Quran memorization learning process.	0 0	0 0	2 10	12 60	6 30	4.55	0.510	High
Total mean (Confidence Metric)							**4.33**	**0.614**	**High**

Item	**Satisfaction (S) Metric**	**SD** **F** **%**	**D** **F** **%**	**U** **F** **%**	**A** **F** **%**	**SA** **F** **%**	**Mean**	***SD***	**Level**
G1	I find the EzHifz application useful.	0 0	0 0	5 25	6 30	9 45	4.20	0.834	High
G2	The content of the EzHifz application arranged facilitates student learning.	0 0	2 10	2 10	7 35	9 45	4.30	0.733	High
G3	EzHifz application is easy for me to use.	0 0	1 5	1 5	6 30	12 60	4.45	0.826	High
G4	EzHifz application makes it easy for me to understand the translation of the Quran.	0 0	0 0	3 15	5 25	12 60	4.45	0.759	High
G5	Pictures in the application help users learn the Quran.	0 0	0 0	4 20	9 45	7 35	4.15	0.745	High
G6	The videos used help to make active learning.	0 0	1 5	5 25	5 25	9 45	4.10	0.968	High
G7	The visual map of the EzHifz	0 0	1 5	7 35	9 45	3 15	3.70	0.801	Medium-High

	application makes it easy to access the desired Quran verse.								
G8	The graphics used help the users understand the content of learning.	0 0	0 0	2 10	10 50	8 40	4.30	0.657	High
G9	Users can memorize and recall verses using their learning styles.	0 0	1 5	1 5	10 50	8 40	4.25	0.786	High
G10	Users can use the EzHifz application anytime and anywhere.	0 0	0 0	2 10	9 45	9 45	4.35	0.671	High
G11	EzHifz application can be read at any time.	0 0	0 0	6 30	8 40	6 30	4.00	0.795	High
Total mean (Satisfaction Metric)							**4.20**	**0.780**	**High**
TOTAL MEAN FOR MOTIVATION							**4.27**	**0.155**	**HIGH**

Based on Table 5.6, the evaluation of the EzHifz model on the aspect of attention, relevance, confidence, and satisfaction.

In the aspect of attention, the item with the highest mean was the item 'The screen design is attractive.' with a mean = 4.65, sd = 0.587, and 95.0 percent of the respondents agree and strongly agree. This is followed by the items of 'EzHifz application attracts students to memorize the Quran' (mean=4.55,sd=0.510), 'interested in memorizing the Quran verses and translations using the application' (mean=4.45,sd=0.759),' has increased my interest'(mean=4.45,sd=0.510), 'interested in memorizing the Quran using the VARK learning style'(mean=4.45,sd=0.510), 'pictures used are interesting' (mean=4.35,sd=0.671), 'audio of the EzHifz application attracts' (mean=4.30,sd=0.865),' use of the EzHifz application makes me interested in mastering the VARK learning style' (mean=4.30,sd=0.865), 'pictures of the EzHifz

application attract the users' (mean=4.25,sd=0.910), 'video of the EzHifz application attracts users' (mean=4.25,sd=0.910), 'using body motions and hand gestures through video display can make my learning active and interesting' (mean=4.20,sd=0.951), 'interesting by listening to an audio' (mean=4.15,sd=0.875) and 'visual maps of the EzHifz application attract users' (mean=4.10,sd=0.788). However, only the item 'intends to use the EzHifz application in memorizing the Quran' has a mean average of 3.90 and a standard deviation of 1.071. It was also the lowest mean item of attention element with 50 percent of respondents agreeing and strongly agreeing.

In the aspect of relevance, the item with the highest mean was the item 'that supports the user to memorize the Quran using a variety of senses namely eyes, ears, body motion, and hand gestures with a mean = 4.55, sd = 0.605, and 95.0 percent of the respondents agree and strongly agree. This is followed by the items 'provides students with a function to memorize the Quran verses repetitively' (mean=4.45, sd=0.826), 'suitable for memorizing the Quran' (mean=4.35, sd=0.875),' suitable for the needs of the users'(mean=4.35,sd=0.671), 'clear words to read' (mean=4.30,sd=0.801),' provides support materials for the students. (mean=4.30,sd=0.801), 'has a selection of modes of VARK learning style' (mean=4.30,sd=0.470), 'visual maps provide surah and verse' (mean=4.25,sd=0.834),' visual maps provide icons of words and images of keywords that allow students to recall memorized verses'(mean=4.20,sd=0.834), 'uses all multimedia elements including pictures, words, audio, and video' (mean=4.20,sd=0.616), 'useful for memorizing the Quran'(mean=4.15,sd=0.988), 'contains visual maps that help users to get an overview'(mean=4.15,sd=0.745), 'controlled audio memorization' (mean=4.10, sd=0.968) and 'content meets the syllabus'(mean=4.05,sd=0.224). However, only the item 'speed of content presentation

in the EzHifz application can be controlled by the user having a mean average of 3.90 and a standard deviation of 0.718. It was also the lowest mean item of relevance element with 80 percent of respondents agreeing and strongly agreeing.

In the aspect of confidence, the item with the highest mean was the item knowing my right VARK learning style makes memorizing process effective and enjoyable with a mean = 4.75, sd = 0.550 and 95.0 percent of the respondents agree and strongly agree. This is followed by the items of 'technique of memorizing in the EzHifz application helps my memorization process'(mean=4.60,sd=0.503), 'selection of the VARK learning style in the EzHifz application reinforces my memorization'(mean=4.60,sd=0.503),'learning to use a combination of graphics, text, sound, and video can speed up my Quran memorization learning process'(mean=4.55,sd=0.510), 'EzHifz application makes my learning easier to memorize the Quran verses and translations'(mean=4.45,sd=0.759), 'can use the EzHifz application on my own'(mean=4.45,sd=0.686), 'enabled me to easily identify the VARK learning styles that I am interested in'(mean=4.40,sd=0.503),' 'selection of the VARK learning style in the EzHifz application reinforces my understanding' (mean=4.35,sd=0.489),' EzHifz application makes learning easier to memorize the words of the Quran'(mean=4.25,sd=0.639), 'EzHifz application makes my learning easier to master the Quran memorization'(mean=4.25,sd=0.550), 'visual maps make it easy for students to compose and link one verse to another'(mean=4.20,sd=0.616),' use of the EzHifz application improves my ability to memorize'(mean=4.15,sd=0.366), 'can enhance my understanding' (mean=4.10,sd=1.294) and supports my VARK learning style'(mean=4.00,sd=0.725). However, only the item 'EzHifz application helps me master the VARK's learning style in memorizing the Quran' has a mean

average of 3.80 and a standard deviation of 0.523. It was also the lowest mean item of confidence element with 75 percent of respondents agreeing and strongly agreeing.

In the aspect of satisfaction, the item with the highest mean was the item 'EzHifz application is easy for me to use.' with a mean = 4.45, sd = 0.826, and 90.0 percent of the respondents agree and strongly agree. This is followed by the items 'EzHifz application makes it easy for me to understand the translation of the Quran' (mean=4.45,sd=0.759),' users can use the EzHifz application anytime and anywhere' (mean=4.35,sd=0.671), 'content of the EzHifz application arranged facilitates student learning' (mean=4.30,sd=0.733), 'graphics used help the users understand the content of learning'(mean=4.30,sd=0.657),' users can memorize and recall verses using their learning styles'(mean=4.25,sd=0.786), 'find the EzHifz application is useful'(mean=4.20,sd=0.834),' pictures in the application help users to learn the Quran'(mean=4.15,sd=0.745),' videos used help to make learning active'(mean=4.10,sd=0.968) and 'EzHifz' application can be read at any time (mean=4.00,sd=0.795). However, only the item 'The visual map of the EzHifz application makes it easy to access the desired Quran verse' has a mean average of 3.70 and a standard deviation of 0.801. It was also the lowest mean item of confidence element with 60 percent of respondents agreeing and strongly agreeing.

The total mean of the attention aspect is 4.31 with and standard deviation of 0.770, the relevance aspect is 4.24 with a standard deviation of 0.732, the confidence aspect is 4.33 and a standard deviation of 0.614 and the satisfaction aspect is 4.20 with and standard deviation of 0.780 as shown in Table 5.7. The findings show that the mean of the overall design of motivation is 4.27 and a standard deviation of 0.155 which is interpreted as high. This shows that, overall, the respondents strongly agree with the

EzHifz model using the EzHifz application as a supportive tool to motivate in memorizing the Quran. Motivation is an important predictor of learning and achievement. The students might more motivated to learn persist longer, produce higher quality effort, learn more deeply, perform better in classes and on standardized tests. Keller's ARCS Model of motivation has been successfully applied to all type of learning settings in the EzHifz application that represent EzHifz Model.

Table 5.7: Total mean for Motivation of user

Evaluation Metric	Total Mean	Standard Deviation	Interpretation
-Attention	4.31	0.770	High
-Relevance	4.24	0.732	High
-Confidence	4.33	0.614	High
-Satisfaction	4.20	0.780	High
Average Motivation Model	**4.27**	**0.155**	**High**

5.6 Finding of Discussion on Observation

In this study, the observation technique was used in supporting qualitative data acquisition. Twenty (20) students were observed while using the application and completing the questionnaire form. Respondents were also asked a few questions which can prove whether they gained a better understanding of learning *surah Al-Insaan* by using the application that represents the EzHifz model. The observation process is also supported by audio and video recordings.

5.6.1 Usability of EzHifz Prototype

Usability can be measured by analyzing the percentage of user success (Nielsen, 1996; Nielsen & Farrell, 2014). Usability data collected in numerical form will help researchers determine the goals of a design and the need to improve a model through a developed application. Success percentage users only indicate the percentage

of tasks completed but do not state why they failed or the extent of user achievement when completing the task. Usability data that uses user success percentages are easy to collect, easy to measure, and as well as cost-effective. The findings of this study are divided into application learnability and user satisfaction with the application.

a) Learnability of Memorization Screen

Learnability metrics are to measure how easy an application prototype to learn, or how fast first-time users can complete tasks on the application prototype. The learnability of each memorization screen is measured in terms of function and multimedia elements used so that the user can achieve the EzHifz prototype objectives. The details have been listed in the observation form in Appendix 6.

Learnability metrics are measuring the number of tasks completed with ease for the first time. The learnability is tested in terms of how easy the application is for users to accomplish a task the first time they encounter the interface without assistance. Multimedia elements are used so that the user is aware of the necessary button functions or tasks implemented. Users also know to 'click' and select the correct button to proceed with the learning. Learnability metrics measurement includes easily selecting VARK's learning style mode, easy-to-use Quran memorization technique based on VARK's learning style mode, simply clicking the right button for the first time, knowing the function of the buttons on the interface, no need for help, not confused, misguided and error. To analyze the data learnability, data findings from the observation list are included in the analysis table success percentage, to calculate the success percentage of each screen. The following are equations used to measure learnability:

Learnability (%) = (Success +(Partial x 0.5) / Total x 100%

The success percentage analysis table of learnability can be seen in Appendix 7. The analysis of data observations can be seen as follows:

The average learnability of the memorization screen is 94.5%. Table 5.8 shows the learnability of the memorization screen as shown in Table 5.8.

Table 5.8: Learnability of Memorization Screen

Screen No.	Screen Categories	Number of screens tested	% Learnability Success
1	Visual map	1 screen	96.6%
2	Ta'awuz	1 screen	94,2%
3	Basmalah	1 screen	97.5%
4	VARK Memorization	1 screen (1 verse only)	90%
5	VA Modes	4 screens	98.3%
6	Sub-visual	3 screens	96.7%
7	RA Modes	4 screens	95%
8	KA Modes	1 screen	92.5%
9	Sub-kinesthetic	7 screens	90%
	Average of screen categories-tested	**23 screens**	**94.5%**

Analysis shows users can easily select VARK's learning style mode, easy to use Quran memorization technique based on VARK's learning style mode, simply clicking the right button for the first time, knowing the function of the buttons on the interface, and no need for help, not confused, misguided and error. It also shows the percentage of learnability on each screen is significant as well as users can use the application smoothly and easily.

b) User Satisfaction with Memorization Screen

A measure of user satisfaction is a measurement of what is felt or user feelings when using the application. User satisfaction metrics tested users are detailed and have been listed in the observation form as in Appendix 6. User satisfaction measurement metrics include reactions to buttons, reactions to interface design, reactions to graphics, voice,

text, and kinesthetics, and reactions to Quran memorization techniques using the VARK learning style mode.

To analyze the data on user satisfaction, data findings from the observation list are included in the analysis table success percentage, to calculate the success percentage of each screen. The following are equations used to measure user satisfaction :

User Satisfaction (%)= (Success +(Partial x 0.5) / Total x 100%

The success percentage analysis table of user satisfaction can be seen in Appendix 7. The analysis of data observations can be seen as follows:

The average user satisfaction with the memorization screen is 95.1%. User satisfaction with the memorization screen as shown in Table 5.9.

Table 5.9: User Satisfaction of Memorization Screen

Screen No.	Screen Categories	Number of screens tested	% User Satisfaction Success
1	Visual map	1 screen	92.5%
2	*Ta'awuz*	1 screen	93.8%
3	*Basmalah*	1 screen	93.8%
4	VARK Memorization	1 screen (1 verse only)	96.3%
5	VA Modes	4 screens	93.8%
6	Sub-visual	3 screens	97.5%
7	RA Modes	4 screens	100%
8	KA Modes	1 screen	95%
9	Sub-kinesthetic	7 screens	93.8%
	Average of screen categories-tested	**23 screens**	**95.1%**

Analysis shows users react positively to the use of buttons, interface design, graphics, voice, text, kinesthetics, and Quran memorization techniques using the VARK learning style mode. This indicates a successful application attracting users to continue using the application.

To measure the overall usability (learnability and user satisfaction) of the application can be measured by obtaining the average of two metrics. The following are equations used to measure the usability of the EzHifz application represents the EzHifz model :

Usability (%)= (Learnability + User Satisfaction) / 2 x 100%

Table 5.10 shows the usability of the evaluated memorization screen. The usability test for screen 7 recorded a higher percentage than another 8 screens categories tested. Overall average memorization screen usability test indicates 94.9% success.

Table 5.10: Usability of Memorization Screen

Screen No.	Screen Categories	Number of screens tested	% Learnability Success	% User Satisfaction Success	**% Usability Success**
1	Visual map	1 screen	96.6%	92.5%	**94.6%**
2	*Ta'awuz*	1 screen	94,2%	93.8%	**94%**
3	*Basmalah*	1 screen	97.5%	93.8%	**95.7%**
4	VARK Memorization	1 screen (1 verse only)	90%	96.3%	**93.2%**
5	VA Modes	4 screens	98.3%	93.8%	**96.1%**
6	Sub-visual	3 screens	96.7%	97.5%	**97.1%**
7	RA Modes	4 screens	95%	100%	**97.5%**
8	KA Modes	1 screen	92.5%	95%	**93.8%**
9	Sub-kinesthetic	7 screens	90%	93.8%	**92%**
	Average of screen categories-tested	**23 screens**	**94.5%**	**95.1%**	**94.9%**

Each screen recorded a significant usability success percentage exceeding 90%. Analysis shows this application achieves a significant average percent of usability success.

5.6.2 Motivation of user

Motivation refers to someone's desire to achieve a task or goal. It determines the success or failure of completing any complex mission (Fadzli et al., 2020). Motivation can be measured by analyzing the percentage of user interest and curiosity (Keller, 2010). Motivation data collected in numerical form will help researchers determine the motivation of users within a model design through a developed application. Interest percentage users only indicate the percentage of tasks completed but do not state why it is not interesting. Motivation data that uses user interest percentages are easy to collect, easy to measure, and as well as cost-effective. The findings of this study are divided into attention, relevance, confidence, and satisfaction of the user.

a) Attention of Memorization Screen

Attention metrics are a measure of referring to learners' curiosity and arousal, interest, boredom, and other related areas of sensation-seeking. The attention of each memorization screen is measured in terms of the interest of the user in the multimedia elements used so that the user can achieve the application objectives. The details that have been listed in the observation form in Attention metrics measurement include the attraction of learning activities, the attraction of material, and the attraction of learning resources or learning media used, which can focus on material and curiosity. To analyze the data attention, data findings from the observation list are included in the analysis table interest percentage, to calculate the interest percentage of each screen. The following are equations used to measure attention:

Attention (%)= (Like +(Partial x 0.5) / Total x 100%

The interest percentage analysis table of attention can be seen in Appendix 8. The analysis of data observations can be seen as follows:

The average attention on the memorization screen is 94.1%%. Table 5.11 shows the attention of the memorization screen.

Table 5.11: Attention of Memorization Screen

Screen No.	Screen Categories	Number of screens tested	% Attention Success
1	Visual map	1 screen	97%
2	*Ta'awuz*	1 screen	91%
3	*Basmalah*	1 screen	93%
4	VARK Memorization	1 screen (1 verse only)	92%
5	VA Modes	4 screens	91%
6	Sub-visual	3 screens	93%
7	RA Modes	4 screens	100%
8	KA Modes	1 screen	90%
9	Sub-kinesthetic	7 screens	100%
	Average of screen categories-tested	**23 screens**	**94.1%**

Analysis shows users react positively to the learning activities, material learning resources, or learning media used, focus on the material, and have curiosity. This indicates a successful application in attracting and motivating users using the application.

b) Relevance of Memorization Screen

Relevance metrics are a measure of referring to learners' perceptions that the instructional design requirements are consistent with their goals, compatible with their learning styles, and connected to their past experiences. The relevance of each memorization screen is measured in terms of the interest of the user in the multimedia elements used so that the user can achieve the application objectives. The details have been listed in the Observation Form in Appendix 6. Relevance metrics measurement

includes having a feeling of wanting to succeed in learning and feeling that the material is met as needed. To analyze the data relevance, data findings from the observation list are included in the analysis table interest percentage, to calculate the interest percentage of each screen. The following are equations used to measure relevance:

Relevance (%)= (Like +(Partial x 0.5) / Total x 100%

The interest percentage analysis table of relevance can be seen in Appendix 8. The analysis of data observations can be seen as follows:

The average relevance of the memorization screen is 94.7%. Table 5.12 shows the relevance of the memorization screen.

Table 5.12: Relevance of Memorization Screen

Screen No.	Screen Categories	Number of screens tested	% Relevance Success
1	Visual map	1 screen	100%
2	*Ta'awuz*	1 screen	92.5%
3	*Basmalah*	1 screen	95%
4	VARK Memorization	1 screen (1 verse only)	90%
5	VA Modes	4 screens	95%
6	Sub-visual	3 screens	95%
7	RA Modes	4 screens	100%
8	KA Modes	1 screen	90%
9	Sub-kinesthetic	7 screens	95%
	Average of screen categories-tested	**23 screens**	**94.7%**

Analysis shows users react positively to the feeling of wanting to succeed in learning and feeling that the material is met as needed. This indicates a successful application in users' feelings and motivates users to use the application.

c) Confidence in Memorization Screen

Confidence metrics are a measure of referring to the effects of positive expectancies for success, experiences of success, and attributions of successes to one's abilities and efforts rather than to luck or to task challenge levels that are too easy or difficult. The confidence of each memorization screen is measured in terms of the interest of the user in the multimedia elements used so that the user can achieve the application objectives. The details have been listed in the Observation Form in Appendix 6. Confidence metrics measurement includes having a feeling that one can learn the contents of the material, having an easy feeling of remembering the material or content of the lesson, and having feelings that one will succeed in the test. To analyze the data confidence, data findings from the observation list are included in the analysis table interest percentage, to calculate the interest percentage of each screen. The following are equations used to measure relevance:

Confidence (%)= (Like +(Partial x 0.5) / Total x 100%

The interest percentage analysis table of confidence can be seen in Appendix 8. The analysis of data observations can be seen as follows:

The average confidence of the memorization screen is 91.9%. Table 5.13 shows the confidence of the memorization screen.

Table 5.13: Confidence in Memorization Screen

Screen No.	Screen Categories	Number of screens tested	% Confidence Success
1	Visual map	1 screen	91.7%
2	*Ta'awuz*	1 screen	91.7%
3	*Basmalah*	1 screen	93.3%
4	VARK Memorization	1 screen (1 verse only)	90%
5	VA Modes	4 screens	90%

6	Sub-visual	3 screens	90%
7	RA Modes	4 screens	91.7%
8	KA Modes	1 screen	93.3%
9	Sub-kinesthetic	7 screens	95%
	Average of screen categories-tested	**23 screens**	**91.9%**

Analysis shows users react positively to the feeling can learn the contents of the material, remember the material or content of the lesson, and will succeed in the test. This indicates a successful application in users' feelings and motivates users to use the application.

d) Satisfaction of Memorization Screen

Satisfaction metrics are a measure of referring to the mix of intrinsically and extrinsically rewarding outcomes that sustain desirable learning behaviors and discourage undesirable ones. The satisfaction of each memorization screen is measured in terms of the interest of the user in the multimedia elements used so that the user can achieve the application objectives. The details have been listed in the Observation Form in Appendix 6. Satisfaction metrics measurement includes having a feeling of being happy about the lesson, having a feeling of being satisfied with the tests achieved, and feeling good about learning design. To analyze the data satisfaction, data findings from the observation list are included in the analysis table interest percentage, to calculate the interest percentage of each screen. The following are equations used to measure satisfaction:

Satisfaction (%)= (Like +(Partial x 0.5) / Total x 100%

The interest percentage analysis table of satisfaction can be seen in Appendix 8. The analysis of data observations can be seen as follows:

The average satisfaction with the memorization screen is 93.9%. Table 5.14 shows the satisfaction with the memorization screen.

Table 5.14: Satisfaction of Memorization Screen

Screen No.	Screen Categories	Number of screens tested	% Satisfaction Success
1	Visual map	1 screen	95%
2	*Ta'awuz*	1 screen	95%
3	*Basmalah*	1 screen	95%
4	VARK Memorization	1 screen (1 verse only)	90%
5	VA Modes	4 screens	93.3%
6	Sub-visual	3 screens	91.6%
7	RA Modes	4 screens	96.7%
8	KA Modes	1 screen	95%
9	Sub-kinesthetic	7 screens	93.3%
	Average of screen categories-tested	**23 screens**	**93.9%**

Analysis shows users react positively to the feeling of being happy about the lesson, satisfied with the tests achieved, and feeling good about learning design. This indicates a successful application in users' feelings and satisfaction to motivate users to use the application.

The overall motivation (attention, relevance, confidence, satisfaction) of the users can be measured by obtaining the average of four metrics. The following are equations used to measure the motivation of the user while using the EzHifz application to represent the EzHifz model :

Motivation (%)= (Attention + Relevance + Confidence + Satisfaction) / 4 x 100%

shows the motivation of the evaluated memorization screen. The motivation test for screens 1 and 9 recorded a higher percentage than another 7 screens categories tested. Overall average memorization screen usability test indicates 93.6% success as shown in Table 5.15.

Table 5.15: Motivation of Memorization Screen

Screen No.	Screen Categories	Number of screens tested	% Attention Success	% Relevance Success	% Confidence Success	% Satisfaction Success	**% Motivation Success**
1	Visual map	1 screen	97%	100%	91.7%	95%	**95.8%**
2	*Ta'awuz*	1 screen	91%	92.5%	91.7%	95%	**92.6%**
3	*Basmalah*	1 screen	93%	95%	93.3%	95%	**94.1%**
4	VARK Memorization	1 screen (1 verse only)	92%	90%	90%	90%	**90.5%**
5	VA Modes	4 screens	91%	95%	90%	93.3%	**92.3%**
6	Sub-visual	3 screens	93%	95%	90%	91.6%	**92.4%**
7	RA Modes	4 screens	100%	100%	91.7%	96.7%	**97.1%**
8	KA Modes	1 screen	90%	90%	93.3%	95%	**92.1%**
9	Sub-kinesthetic	7 screens	100%	95%	95%	93.3%	**95.8%**
	Average of screen categories-tested	**23 screens**	**94.1%**	**94.7%**	**91.9%**	**93.9%**	**93.6%**

Each screen recorded a significant motivation interest percentage exceeding 90%. Analysis shows the motivation of users achieves a significant average percent of motivation interest while using the application.

5.7 Discussion of the Research Findings

Based on the research objectives (RO) and research question (RQ) outlined in the previous Chapter 1, the following section presents the discussion of the research finding of this study.

5.7.1 Identify the elements of the EzHifz Model

RO1: To identify the multimedia representation learning model elements for Quran memorization techniques based on VARK learning style.

RQ1: What are the appropriate multimedia representation learning model elements for Quran memorization techniques based on VARK learning style?

The output of the first research objective is the EzHifz model elements that were achieved in the analysis phase. The first research objective was identified through the literature review, comparison with previous studies, and preliminary study. This study found four elements of multimedia representation learning model (EzHifz Model) for Quran memorization techniques based on VARK learning style namely 2: Thirteen (13) most suitable Quran memorization techniques were , one (1) multimedia presentation, four (4) memory sensory, and two (2) working memory, for EzHifz model elements as discussed in Chapter 2. The explanation of the proposed EzHifz model design elements is as follows:

a) Quran memorization techniques

This study found 16 most common elements of the Quran memorization techniques and thirteen most suitable Quran memorization elements were selected to be applied in this study namely repetition, comprehension, reading, listening, segmentation, movement, visual map/mind map, keyword, pointer, highlight, zooming, open-close/hide-show, and association. The explanation on the thirteen adapted Quran memorization techniques elements are:

i. Repetition is the common technique in memorizing Quran. This element emphasized in the model to strengthen the memorization process until the Quran verse and translation memorized and recall fluently.

ii. Comprehension is the techniques of knowing the meaning of Quran verse through the translation of words and pictures to enhance understanding and strengthen the Quran memorization process.

iii. Reading is the technique of forming a pattern of word in the mind through understanding the Quran verse and translation. It also enables to turn writing into meaning.

iv. Listening is the technique of hearing recitation of Quran verse and translation through an audio or sound of recitation Qari.

v. Segmentation is the technique of break up a long Quran verse and translation into a smaller manageable parts of words, pictures, audio and video for easiest memorization process.

vi. Movement is the technique of non-verbal communication or sign language that shows the meaning of Quran verse through the imagination of the Quran translation using body motions and hand gestures namely shaking, head posture, facial expressions, hand gestures and upper body posture to show a variety of feelings, thought and emotions.

vii. Visual map/mind map is a technique of connecting an arrangement of Quran verse with combination of pictures and word that represents as an icons of each Quran verse. It is used to organize and linked one verse to the next verse for easy recall memory.

viii. Keyword is the technique used to represent each Quran verse and translation using words and images. The prefix of words or beginning of each Quran verse used with part of image that symbolize the meaning of Quran verse were integrate in one icon for easy recall. It is called acoustic and mental links.

ix. Pointer is the technique of encoding behavior of kinesthetic code through pointing some key contents to create an attention and focus in the memorization process through the words of Quran.

x. Highlight is also the technique of encoding behavior of kinesthetic code through stressing some key content or essential material of Quran translation.

xi. Zooming is the technique of enlarged the size of images for each meaning of Quran verse for easy identification of artworks displayed to focus and remembered.

xii. Open-close/Hide-show is the technique of open-closed alternately the Quran verse and translation while memorization process including the learning style used. It is also minimizing the load of Quran memorization process at a certain time.

xiii. Association is the technique of presenting mental association of content and visual spatial cues of Quran translation in one image using mnemonic strategy with the colored images to remember.

b) Multimedia presentation

Multimedia presentations is a presentation featuring multiple (multi) types of media. In this study, the media types include videos, images, animations, audios, or texts. with different resolutions, durations, and start times was arranged spatially and temporally. The adapted element in this component is pictures of body motions and hand gestures which defines as a signs of movements of the body's behaviors and actions about Quran verse and translation to facilitate vocal communication as a good strategy for memory enhancement. The non-linear content types used in this model for the user interactivity to control progress as well as the preferred learning style. The content of multimedia

presentation helps to vary and enhance the memorization process, and leads to better knowledge retention. The multimedia presentation with interactive media also integrates with certain Quran memorization techniques elements to support the different styles of learning in visual, verbal, auditory, and kinesthetic learning styles. Interactive multimedia presentation has played an important role in developing the process of memorization Quran verse and translation towards a more dynamic quality.

c) Sensory Memory

Sensory memory also known as the sensory register; sensory memory is the storage of information that we receive from our senses. It is a mental representation or memory system that records the information received through the senses by receptor cells that can retain impressions of sensory information through the five senses of sight, hearing, smell, taste, and touch. There are three types of sensory memory used in this study: echoic memory, iconic memory, and haptic memory. Iconic memory retains information that is gathered through sight, echoic memory retains information gathered through auditory stimuli and haptic or tactile memory retains data acquired through touch or gripping and interacting with familiar objects. It may also influence one's interactions with novel objects of an apparently similar size and density. In this study, four adapted elements in this component are visual, auditory, reading, and kinesthetics. These elements replaced the existing elements of Mayer's model is the ears and eyes as it has the same function as the adapted elements of visual and auditory elements. The detailed definition of the four (4) elements is:

i) Visual (V) preferences learn through pictures and symbols rather than words. It represents the pictures occupying the eyes, as a visual sensory copy in visual sensory memory. It is related to visual-spatial intelligence as the

capacity to recognize and perform the illustration of objects received by the brain. Visual-spatial intelligence is the capacity to understand and mentally navigate through a sense of direction, the ability to match or complement patterns, shapes, or colors, and accurately recall physical objects and spaces in a different context.

ii) Auditory (A) preferences learn through conversations that represent spoken words enforced on the ears, as an auditory sensory copy in auditory sensory memory. Once an auditory input is received it is called a voice or other sound. The information is processed and transmitted to auditory memory to determine recognition. It is related to musical intelligence as the capacity to recognize the sound and composition of rhythm and tone. Musical intelligence is a skill and interest in the formal and informal aspects of music.

iii) Reading (R) preferences learn through words and texts and represent as the printed words occupy the eyes as a visual sensory copy in visual sensory memory(Schunk, 2012). Linguistic intelligence is the capacity to use language to convey thoughts and understand the words of others, either orally or in writing. Linguistic intelligence is a skill and interest surrounding words that can be found within the context of both written and spoken language.

iv) Kinesthetic (K) preferences learn through experiences in the form of demonstrations, videos, and applications that represents the signs of movements of the body's behaviors and actions and occupy the eyes, as a visual sensory copy in visual sensory memory. It is related to bodily-

kinesthetic intelligence as the capacity to coordinate the movement of the whole body. Bodily-Kinesthetic intelligence is a deep understanding with the ability to skillfully craft or communicate or amend using the hands and body.

d) Working Memory

Working memory is short-term memory and has a limited capacity for temporary recall of the information which is being processed at any point in time and holds a small amount of information (typically around 7 items or even less) in mind in an active, readily available state for a short period (typically from 10 to 15 seconds, or sometimes up to a minute). Two adapted elements in this component are the signs and gestures model. These two elements were added to enhance Mayer's model (auditory and visual channels) with another Kinesthetic channel because the motor area of the brain is activated by the movement of signs or actions, therefore, static learning through auditory and visual ways seems insufficient. The detailed definition of the two (2) elements is (i) signs are anything that signifies interrelation with the linguistics and symbols that can mimic each other's facial expressions, gestures, or body movements with the visual properties of events, objects, and spatial relations, to form meaning and (ii) gestures model is a model of oral communication or non-verbal interaction of body, hand and arm movements or actions that imitate the gestures through the communicative manual structures.

In addition, an analysis of EzHifz model elements has also been done in Chapter 2 for mapping the selected thirteen (13) Quran memorization techniques (reading, listening, comprehension, open-close/hide-show, repetition, segmentation, association, pointer, highlight, zooming, movement, visual map/mind map, keyword), one (1)

multimedia presentation (pictures of body motions and hand gestures), four (4) memory sensory (visual, auditory, reading, kinesthetics), two (2) working memory (signs, gestures model), with four (4) elements of VARK learning style (visual, auditory, reading, kinesthetic), four (4) elements of Multiple Intelligence Theory (linguistic, visual-spatial, bodily-kinesthetic, musical) and ARCS motivational model (attention, relevance, confidence, and satisfaction). This finding addressed the first objective of this study on the appropriate EzHifz model elements for memorizing the Quran and successfully answered the first (1) research question. The proposed EzHifz model elements are suitable for this study.

5.7.2 Develop and implement the EzHifz model

RO2: Design and develop the model of multimedia representation learning for motivating in memorizing Quran.

RQ2: How to design and develop the model of multimedia representation learning for motivating in memorizing the Quran?

The output of the second research objective was achieved in the design, development, and implementation phase. The output of the second objective is to design the final EzHifz model design, low-fidelity EzHifz model design, and EzHifz prototype for motivating students in memorizing the Quran.

In this research, the EzHifz model was designed based on the elements identified in the analysis phase which are: Quran memorization techniques (reading, listening, comprehension, open-close/hide-show, repetition, segmentation, association, pointer, highlight, zooming, movement, visual map/mind map, keyword), multimedia presentation (pictures of body motions and hand gestures), memory sensory (visual, auditory, reading, kinesthetics) and working memory (signs, gestures model) integrated

with the ARCS motivational model design to embed the motivational elements (attention, relevance, confidence satisfaction) into the design. This EzHifz model was designed using the low-fidelity design in prototyping. The EzHifz model design was designed based on process flow for low-fidelity EzHifz model design as discussed in Chapter 4 and findings in Chapter 5.

In the design stage, three steps in the EzHifz model design are: identify EzHifz model design elements, sketch the EzHifz model design, and final EzHifz model design. In step (1) the elements of the EzHifz model design that were identified from the analysis phase in the literature review, comparison with previous studies, and preliminary study were performed to identify the EzHifz model design elements for memorizing the Quran including the relation with VARK Learning Style, Multiple Intelligence Theory, and ARCS motivational model. The elements were identified as adapted elements of the EzHifz model design in Mayer's model; in step (2) the sketch of the EzHifz model design was illustrated to visualize the elements and relationships between the components as adapted elements in Mayer's model using a paper-based, and step (3) The final EzHifz model design was then designed in digital using Adobe Photoshop software. The low-fidelity EzHifz model design was illustrated through sketching interfaces using paper-based and then designed digitally using Adobe Photoshop software in high-fidelity EzHifz model design to visualize the content of *Surah Al-Insaan* that was validated by the student in a pilot study. The improvements were based on the feedback response received by the students from the pilot study (see Chapter 3).

In the development stage, the EzHifz prototype was developed on the Android mobile application platform. In this research, the interface design for the EzHifz

prototype was designed based on prototyping. Prototyping is a part of the development phase that involves designing the behavior of interactive products. The EzHifz prototype for memorizing the Quran was implemented based on the elements of the EzHifz model. The iterative process built in the EzHifz prototype development is important to produce a prototype that meets the needs and requirements of the users. First, the flow of the memorization module in the EzHifz prototype interface design was determined that consisted of the main page, main menu page, *ta'awuz, basmalah* page, visual map page, and VARK memorization. Second, the storyboards, flowcharts, multimedia elements, organize text, image, voice, animation, and video, as well as integration of the media units and programming for the interface of the EzHifz application prototype, were designed. The twenty-three (23) screens of verse 1 of *Surah Al-Insaan's* layout for the interface design of the EzHifz prototype were sketched and designed using Microsoft PowerPoint. The EzHifz application interface was then developed using Adobe Flash software as discussed in Chapter 4. This application consisted of 31 verses of *Surah Al-Insaan* with a hundred eighty-one (181) interfaces designed of EzHifz prototype for memorizing the 2. This finding further addressed and answered the second research question of this study.

In the implementation stage, testing and validation units of the EzHifz prototype are carried out continuously or with iterative evaluation throughout the process of development until the application prototype was completed. This testing and validation unit aims to trace any syntax and logic errors to be improved immediately to ensure the EzHifz prototype that represents the EzHifz model meets the goals of application development. The EzHifz model design was an adapted model from Mayer's model and was then validated through the EzHifz prototype by the six experts from the Quranic

field and Educational Technology in the context of usability (learnability, user satisfaction) and motivation (attention, relevance, confidence, satisfaction). Each of the attributes was measured and analyzed based on the index of agreement using the Fleiss kappa coefficient (κ) reported in Chapter 3.

5.7.3 Validate the EzHifz model

RO3: To evaluate the usability and user motivation of Multimedia Representation Learning Prototype (EzHifz) for memorizing Quran.

RQ3: What are the responses on the usability and user motivation of Multimedia Representation Learning Prototype (EzHifz) for memorizing Quran?

RQ4: Does the usability of the EzHifz prototype for memorizing Quran influence students' motivation in memorizing the Quran?

The evaluation generally reviewed the EzHifz model through the EzHifz prototype from the aspect of usability (learnability, satisfaction) and motivation (attention, relevance, confidence, satisfaction). The output of the third objective is the feedback and response on the usability of the application and the motivation of the user once the students use the EzHifz prototype for memorizing the Quran. The questionnaire was developed based on the usability and motivation constructs of the needs and requirements of this study. The eighty (80) items in the student instrument are grouped into two sections namely usability of the application and motivation of the user. Twenty-five items in the usability construct consist of two evaluation elements of learnability and satisfaction. Fifty-five items in the motivation construct items were used for motivation elements consisting of the evaluation construct of attention, relevance, confidence, and satisfaction. The instrument is also customized in the Malay

language which is easier for the student to understand. The findings showed that the evaluation of the EzHifz model received positive feedback and response from the students with the total mean (*mean* = 4.30, *SD* = 0.422). The results are statistically proven by the high mean values of each construct evaluated: usability of application (*mean* = 4.33, *SD* = 0.689) and motivation (*mean* = 4.27, *SD* = 0.155). The high mean values indicate the students agreed with the development of the EzHifz prototype and its application for memorizing the Quran.

The answer to the third research question of the EzHifz prototype for memorizing the Quran is: (i) the usability of the EzHifz model design through the aspects of usability meets the requirements of the student's learnability and satisfaction of the application; and (ii) the motivation of the user that focused on the aspect of attention, relevance, confidence, and satisfaction has motivated the students in memorizing the Quran. The results of the EzHifz prototype developed in this study have received positive feedback and responses in the evaluation of the EzHifz model design. It also shows the significance of this study in improving the existing Mayer's model to be applied in memorizing the Quran to meet the needs of the end-user. This finding further addressed and answered the third research question of this study. The findings show that the student as respondents strongly agrees with the use of the EzHifz model design as an alternative technique to memorize the Quran. This also demonstrates the usefulness of the EzHifz prototype as a supportive tool that can assist in memorizing the Quran verse and translation based on their preferred VARK learning style. Table 5.16 summarizes the output of the third research objective that successfully answered the third research question.

Table 5.16: Student Evaluation based on EzHifz Model Metric

Evaluation Metric	Mean	Standard Deviation	Interpretation
Usability of Application	4.33	0.689	High
Motivation	4.27	0.155	High
Total Mean	**4.30**	**0.422**	**High**

The table shows the mean of each evaluation metric for the EzHifz model. The usability of the application attained the highest mean and may affect the process of memorizing the Quran. Students rated the lowest motivation with a mean of 4.27 based on the students' survey. This EzHifz prototype requires further improvement to ensure its element's appropriateness. Overall, the elements for the usability of the application and motivation receive positive responses and feedback that are beneficial for further improvements.

This finding was from the respondents' view on the EzHifz prototype that has been developed. This finding demonstrates the high usability of the application to be used in Quran memorization. The results also show that the EzHifz model that uses Quran memorization techniques elements has successfully integrated into multimedia disciplines. However, some improvements to the motivation elements were needed to ensure the appropriateness of the Quran memorization techniques for memorizing the Quran.

The answer to the fourth research question of the EzHifz prototype for memorizing the Quran is based on the following hypothesis:

H1: Does the usability of the EzHifz prototype for memorizing Quran influence students' motivation in memorizing the Quran?

The results from the correlation analysis of the hypothesis developed in this study showed that the usability of the EzHifz prototype influences students' motivation in memorizing the Quran. Thus, the hypothesis shows a positive relationship between the

usability of the EzHifz prototype based on VARK learning style and the student's motivation in memorizing the Quran is accepted.

Overall, the findings presented that the developed EzHifz prototype represented the EzHifz model has successfully applied the suitable elements in adapting Mayer's model for motivating students in memorizing the Quran. Implementation of this adapted Mayer's model introduced a solution for the problems and needs from the technology-based that exist in the aspect of multimedia application design.

5.8 Research Hypothesis

A research hypothesis of this study is *H1: There is a positive relationship between the usability of the EzHifz prototype and the student's motivation in memorizing the Quran*.

The average statistics results of usability of the application are "usability" 4.33 (SD = 0.689). The average dependent variable is 4.27 (SD = 0.155). Table 5.17 shows the descriptive statistical summary for each variable.

Table 5.17: Descriptive Statistical Summary Table (H1)

Variables	**Average mean**	**Standard Deviation**
Usability	4.33	0.689
User's motivation in memorizing Quran	4.27	0.155
N= 20		

This study uses Pearson's correlation coefficient to verify whether the presence of usability is independent and whether there is a significant level of high or low between the independent variables and dependent variables of the user's motivation in memorizing the Quran. An interpretation of the correlation coefficient is made

concerning Table 5.18, as suggested by Davies (1971) to determine the relationship between the two variables.

Table 5.18: Interpretation of correlation coefficient

Correlation coefficient value (*r*)	Interpretation
.01-.09	Void
.10-.29	Low
.30-.49	Medium
.50-.69	Strong
.70-.99	Very high
1.00	Perfect

(Davies, 1971)

Table 5.19 shows the correlation coefficient results of the two variables. Following statistical results, Pearson's correlation coefficient among the variables is more than .6, indicating that the variables are independent variables that have a strong correlation. This study set it as independent variable incorrectness.

Table 5.19: Pearson's correlation coefficient analysis (H1)

Variables		Usability	User's motivation in memorizing Quran
Usability	Pearson Correlation	1	0.637**
	Sig. (2-tailed)		.000
User's motivation in memorizing Quran	Pearson Correlation	0.637**	1
	Sig. (2-tailed)	.000	

**Correlation is significant at the 0.01 level (2-tailed) (N=20)

Through correlation analysis, we can observe the relationship level between the two variables. The constant correlation coefficient value is between -1.0 to +1.0, + 1 (0 > r > 1) on behalf of a fully positive correlation between the two variables, -1 (0 < r) represents between two variables is a perfect negative correlation. Table 5.20 shows the

results of Pearson's correlation analysis for the dependent variable (user's motivation in memorizing the Quran) and the independent variable (usability). The correlation coefficient among the variables presents a positive correlation of 0 to 1 with a value of 0.637.

Table 5.20: Pearson's correlation analysis (H1)

Variables		**Usability**
User's motivation in memorizing Quran	Pearson Correlation	.637**
	Sig. (2-tailed)	.000

** Correlation is significant at the 0.01 level (2-tailed) (N=20)

Statistics show that for independent variables and dependent variables, their significance is less than 0.1 ($p \leqq 0.1$), indicating the independent variables and dependent variables (user's motivation) all have a strong correlation. This result shows that the usability of the EzHifz prototype that represents the EzHifz model has a positive impact on users' motivation in memorizing Quran. Thus, the hypothesis shows that there is a positive relationship between the usability of the EzHifz prototype that represents the EzHifz model and the user's motivation in memorizing the Quran is accepted.

5.9 Conclusion

This chapter has presented the findings and data analysis of the evaluation of this research by students. EzHifz prototype evaluation was conducted to obtain feedback and respondents from the students. This study uses the common evaluation approach. A set of evaluation constructs has been developed for evaluating the EzHifz prototype that represents the EzHifz model. The instruments were built based on the set of constructs and elements related to the study. A set of questionnaires and observation lists were conducted among the students as the real user. The student instruments have

been divided into two main components of usability of application and motivation. Respondents were provided with the EzHifz prototype for testing based on their preferred VARK learning style after a briefing and an application usage session. The observation was conducted with the one-to-one student based on the observation list form. The questionnaire form was distributed to a sample of 20 students aged 10-15 years. Based on evaluation constructs, the results of quantitative and qualitative studies were obtained and analyzed. The findings demonstrate positive feedback on the use of the EzHifz prototype that represents the EzHifz model in the process of memorizing the Quran verse and translation. The findings also prove that the respondents give positive responses on motivation using the EzHifz prototype as a supportive tool in memorizing the Quran. The next chapter will summarize the overall findings according to the research questions and provide some recommendations for further research.