CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter discusses the research methods used to conduct the study. The discussion covers research design, framework, instrument, procedures, data management, data analysis, trustworthiness, validity, and reliability.

3.2 Research Approach and Design

This study used Richey and Klein's (2007) Design and Development Research (DDR) approach. The design and development method is characterised by a comprehensive investigation of design, development, and evaluation processes to establish scientific foundations for producing instructional and non-instructional products and facilities as well as new or enhanced models, with each step driving such development (Richey & Klein, 2007). DDR is often separated into three phases; 1. need analysis; 2. model design and development; 3. model usability evaluation (Richey & Klein, 2007).

Both quantitative and qualitative methods are used in DDR, and the methods to be used at each phase of research are subject to the research objectives and research questions (Richey & Klein, 2007). A more precise overview of the research

methodology using the DDR approach to be carried out can be seen in Figure 3.1.

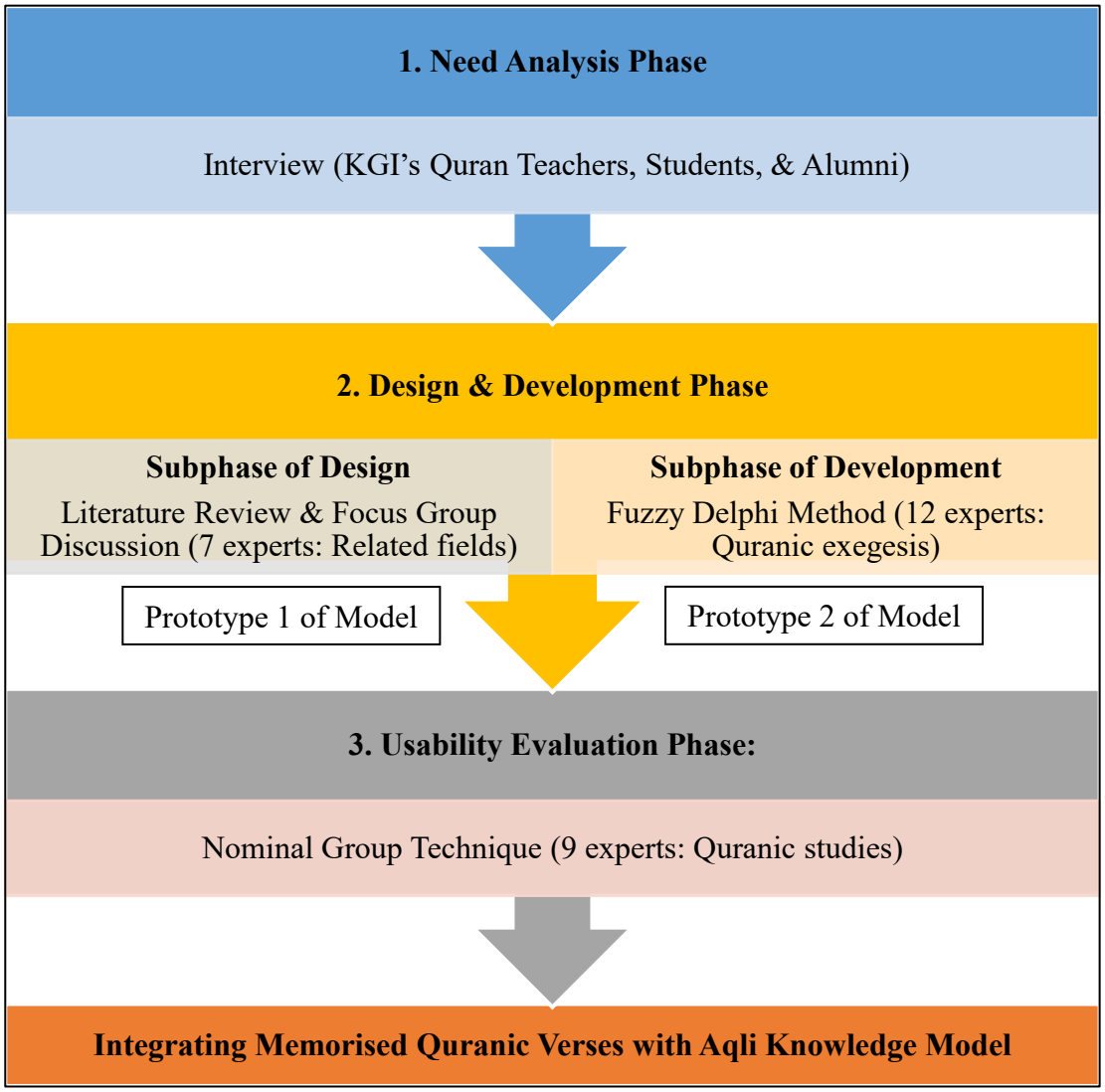

Figure 3.1 Research Methodology Framework

Based on Figure 3.1, there are three phases involved in this study: the need analysis phase, the model design and development phase, and the model usability evaluation phase. The method to be used based on the objectives and research questions in each phase has been set. The need analysis phase used the interview method, the design and development phase used the Focus Group Discussion (FGD) and the Fuzzy Delphi Method (FDM), and the usability evaluation phase used the Nominal Group Technique (NGT). The description of the methods is detailed in the next section.

3.3 Phase 1: Need Analysis

3.3.1 Purpose

This phase aims to identify the need for models, modules, frameworks, or any innovations to be developed so that the results are intended for the target group (Siraj et al., 2020). McKillip (1987) stated that the analysis of the need is a value of judgment for a particular group that had problems to solve. Three models can be used in the need analysis phase, as outlined by McKillip (1987):

i. **Discrepancy Model**: The most accessible and widely used model, especially in education. The model emphasises several expectations; First: the process of setting goals and setting what to do; Second: the performance measurement process involving identifying what should be done; and third: the process of identifying discrepancy, which is what ought to be and what is the problem.

ii. **Marketing Model**: This model emphasises analysing the needs and feedback used by an institution or organisation to assess the customer's needs. The process of analysing the needs in this model will involve three essential points:

    a) Selecting a target population involves targets with a high probability of using a service provided, thus making necessary changes by the customer or user.

b) Choice of Competition position: This process involves competency analysis and challenges against other agencies that affect the organisation.

c) Developing a compelling marketing mix: This phase involves selecting the accuracy and quality of services that can have the maximum impact on the expected population of consumers.

iii. **Decision-making model:** It is adapted from the Multi-attribute Utility Analysis (MAUA). This model contains three stages:

a) Problem Modelling: At this stage, identifying needs should be carried out. After identifying the problem, action needs to be formulated to address it.

b) Quantifications: This phase involves measuring and estimating the needs to be made as a reference by policymakers and requirements on a particular matter.

c) Synthesis: This phase involves providing a requirement index to be performed by an organisation. This index will give an overview of the actual need and information related to the products required by the customer.

The researcher used the Discrepancy Model as the basic model in the need analysis phase. The researcher obtained information from Quran teachers, students, and alumni of Kolej GENIUS Insan on integrating memorised Quranic verses with aqli knowledge. Then, the interview data were analysed to identify the discrepancy. In this

regard, this study focused on the question: “How is integrating memorised Quranic verses with aqli knowledge implemented in Kolej GENIUS Insan?”.

3.3.2 Methodology (Interview)

The study for this phase is qualitative by using the interview method to observe the implementation of integrating memorised Quranic verses with aqli knowledge in KGI and the need to develop a model. The rationale for choosing the interview method is that interviews can explore and investigate study participants’ responses to collect in-depth data on the experiences and feelings of the study participants (Gay & Airasian, 2003). Through interviews, a researcher can quickly look and dive into the study participants’ attitudes, interests, feelings, concerns, and values (Merriam, 1998). Besides that, the need analysis’s purpose is to identify the cause of the problem and do what is necessary to solve the problem (Reinbold, 2013). Since the need analysis phase provides essential information in determining the design and development in the next phase (Gagne et al., 2005), the researcher chose the interview method to explore and investigate issues related to integrating memorised Quranic verses with aqli knowledge in Kolej GENIUS Insan.

3.3.3 Instrument

This study was conducted using the interview method. Qualitative intellectuals believe that the interview method is one of the essential data in qualitative studies.

Through interviews, a researcher can know the behaviour, feelings, and how they interpret the world around them through observation (Merriam, 1998; Yin, 1989). Thus, this study used semi-structured interview protocols as an instrument, whereby the researcher has a set of specific questions that can cite information from the study participants. The interview protocol questions have open-ended questions (Appendix A) that allow the study participants to give their perceptions on the implementation of integrating memorised Quranic verses with aqli knowledge and the need to develop a model.

3.3.4 Participant

Choosing study participants who can explain the phenomenon studied instead of representing large populations is a qualitative study sampling technique (Gay & Airasian, 2003). A larger number of study participants involved in qualitative research does not necessarily mean the findings are more reliable and valuable. Hence, the selected study participants should have thoughts, information, speech, and experience in the topics and settings of the study (Noh, 2020).

Based on Gay and Airasian's (2003) views, there are two indicators used to determine the selection of study participants was sufficient. First, to what extent did the selected study participants represent the potential participants in the study. Secondly, the matching of information obtained from the study participants. This happened when a researcher began hearing the same views, perspectives, and responses from most study participants. At this stage, the addition of study participants

is no longer required except for specific topics or issues. This is often called data saturation. At the same time, Creswell, (2008) stated that the number of ideal qualitative participants was three to ten people depending on the depth of the study. According to Creswell (2008), significant differences between quantitative and qualitative research samples are purposive sampling samples for qualitative research.

In the study context, the researcher used the purposive sampling technique by selecting three groups: Quran teachers, students, and alumni. Specific characteristics of participants are as in Table 3.1:

Table 3.1 Characteristics of interview participants

Participant	Characteristic
Quran Teacher	- served more than two years - has a bachelor's degree
Students	- has attended 3 years of study - has memorised 8 juz of the Quran
Alumni	- had participated 5 years of study - has memorised 15 juz of the Quran

The location of this study is limited to Kolej GENIUS Insan, Universiti Sains Islam Malaysia (USIM). The selection of Kolej GENIUS Insan was due to two factors. First, Kolej Genius Insan is the only school where gifted and talented Muslim students use a curriculum that covers a minimum of 10 to 15 *juz* of the Quran. Second, the vision and mission of Kolej GENIUS Insan emphasises the integration of naqli and aqli knowledge in line with the niche of Universiti Sains Islam Malaysia (USIM), including a curriculum designed specifically to achieve the vision and mission.

3.3.5 Data Analysis

The data analysis process began as soon as the completion of the data collection from the interviews. The researcher initiated the data analysis process by performing the transcript process, which requires re-copying the data in audio recordings containing interviews with study participants. This process allows the researcher to dive into any data obtained and gain general consideration of the data (Creswell, 2008). Once the transcription process was completed, the researcher conducted an encoding process. The researcher tracked the text segment and assigned a code to it before the text was encoded into a type and theme form. The analysis of data is done manually.

3.3.6 Research Procedures

The researcher carried out several procedures before the interview can be done. First, the researcher has obtained permission to conduct the study from the administration of Kolej GENIUS Insan (KGI) (Appendix B) once Universiti Sains Islam Malaysia has approved the research proposal. Then, the researcher registered this study as no-cost research under USIM Research Management Centre with the code PPPI/BM/KGI/USIM/18221 (Appendix C). An ethical approval application was submitted and approved by the Committee of Research Ethics USIM to conduct the study (Appendix D). The researcher then identified nine study participants based on the criteria and sent an invitation email to be a study participant (Appendix E) along with the consent form (Appendix F). After agreeing on the appropriate date and time, the researcher individually conducted a virtual interview with the study participants.

3.3.7 Trustworthiness

The quality, authenticity, and truthfulness of qualitative research findings are called trustworthiness (Cypress, 2017). Lincoln & Guba (1986) highlighted four aspects of trustworthiness: credibility, transferability, dependability, and confirmability. Credibility is about the consistency of the findings with reality (Merriam, 2009; Stahl & King, 2020). Transferability concerns the extent to which results apply to people in various contexts. Dependability relates to the data's consistency over time and across study settings (Connelly, 2016). While confirmability is related to approaching as close to objective reality as qualitative research can (Stahl & King, 2020).

The trustworthiness in this phase involved several measures proposed by Denzin (2015), namely triangulation and Bogdan & Biklen (2007), which is the validation of interview protocols by field experts, preliminary study, and verification of study participants on interview data.

***Triangulation*.** Triangulation is a qualitative cross-validity technique that aims to assess the adequacy of data through the centralisation (convergence) of information. The most suitable method of triangulation for educational research is methodological triangulation (Idris, 2013). This triangulation involves using more than one method and may adopt the strategy within or between methods (Denzin, 2015). Triangulation within methods involves multiple data sources, and triangulation between methods involves using more than one method of collecting research data (Idris, 2013). In this study context, the triangulation in the method involves interviews from diverse sources i.e., Quran teachers, students, and alumni. At the same time, the triangulation between

methods involves document analysis and classroom observation. Thus, this triangulation technique can support and supplement evidence from various sources and help verify the information obtained from the interview (Darusalam & Hussin, 2019).

Verification of Interview Protocol by Field Experts. The interview protocol was submitted to field experts to review the compatibility of the research objectives with the interview questions. The experts signed the provided verification form of the interview protocol (Appendix G). Then, the researcher made improvements according to the experts' recommendations.

Pilot Study. The evaluation process of the interview protocol was done before the actual study so that the questions presented could provide better information. Therefore, the interview protocol was piloted by interviewing one participant from each group with the same characteristics as the actual study sample to see the suitability of the questions. No questions were simplified and improved based on the pilot study. Thus, these questions were used in the actual study.

Verification of Study Participants on Interview Data. According to Bogdan and Biklen (2007), verification of the interview data collected should increase the validity and reliability of the primary qualitative data by providing written transcripts to the study participants for review and signing. Thus, the researcher presented a completed transcript to the study participants to reread all the contents of the conversation. The study participants corrected the erroneous facts and signed the transcript text after approval. The validity and reliability of data can be improved by correcting facts, acknowledging, and confirming the participants of this interview data.

3.4 Phase 2: Model Design and Development

3.4.1 Purpose of Phase

The design and development phase is intended to design and develop the desired product (Jamil & Noh, 2020). This phase is the heart of the DDR approach because models, modules, etc., are developed (Siraj et al., 2020). The design and development phase of this study aims to develop the integration of memorised Quranic verses with aqli knowledge model in Kolej GENIUS Insan with the research question as follows: "What is the appropriate model of integrating memorised Quranic verses with aqli knowledge to be implemented in Kolej GENIUS Insan?".

3.4.2 Methodology

The researcher used several methods in designing and developing a comprehensive model of integrating memorisation with aqli knowledge. Figure 3.2 displays the methodology for designing and developing the integrating model.

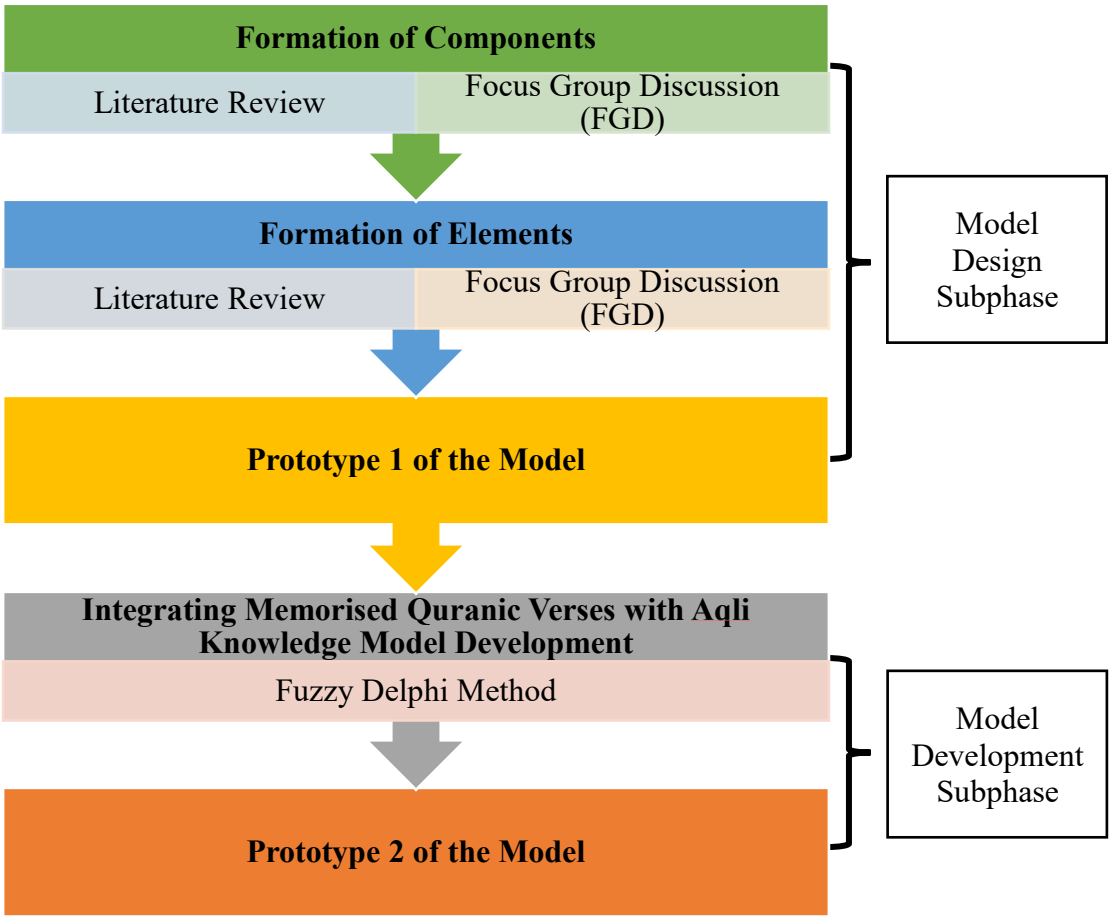

Figure 3.2 The Methodology of Model Design and Development

To understand Figure 3.2, the researcher has described each method used to obtain research data and answer research questions in the design and development phase. The researcher separated this phase into two subphases; the first refers to designing, and the second refers to developing the integrating model.

In the subphase of design, the researcher designed the model's components and elements based on the literature review. Next, the Focus Group Discussion (FGD) approach involved a group of experts related to the field of the study who commented, rejected, and added each component and element in the model designed by the researcher. The outcome of this subphase is Prototype 1 of the model. In the subphase

of model development, the researcher used the Fuzzy Delphi Method (FDM) to develop the model. The outcome of this subphase is Prototype 2 of the model. Table 3.2 briefly describes the subphases of design and development found in Phase 2.

Table 3.2 Subphase, method, and explanation in the phase of design and development

No	Subphase	Method	Explanation
1	Design	Literature Review and Focus Group Discussion (FGD)	Process of designing the components and elements of integrating memorised Quranic verses with aqli knowledge model
2	Development	Fuzzy Delphi Method (FDM)	Process of developing the components and elements in the form of priority and position in the model

3.4.3 Subphase of Design

The subphase of design refers to the production and construction of the components and elements in the model of integrating memorised Quranic verses with aqli knowledge. The researcher designed the components and elements based on the literature review. Next, the Focus Group Discussion (FGD) approach involved a group of experts related to the field of the study to comment, reject, and add each component and element in the model designed by researchers.

Methodology (Focus Group Discussion)

The Focus Group Discussion (FGD), often known as a focus group interview, is a qualitative data-collecting methodology (Dilshad & Latif, 2013). FGD is a type of group interview in which a moderator (interviewer) guides a small group of participants with specific characteristics (Anderson, 1990) through a loosely structured conversation (Mishra, 2016). The purpose is to elicit attitudes, perceptions, feelings, and ideas about the issue or topic (Denscombe, 2007) to address the research objective (Darusalam & Hussin, 2019).

An FGD consisting of experts in the related fields to the study was conducted to obtain their feedback on the components and elements of the model designed based on the literature review. The FGD designed the model of integrating memorised Quranic verses with aqli knowledge, thus achieving the 2nd research objective.

Procedure

The techniques used during the FGD session in this study followed the guidelines suggested by Krueger and Casey (2009). According to Krueger and Casey (2009), a group of individuals with specific characteristics, between 5 to 10 people, will meet and discuss independently a topic. A facilitator helps to determine the discussion's direction.

The researcher invited the FGD participants through USIM's official letter (Appendix H) and set the date, time, and place of the FGD. The discussion process started with focus group members provided with a protocol. The FGD protocol (Appendix I) contains information and explanations related to the FGD session process and the notification of each member's role. Each informant needs to comment on the proposed IMQVWAK model. Feedback from this informer leads to removal or addition, ultimately resulting in modifications to each dimension and construct formed by the researcher.

Participant

According to Idris (2013), the involvement of more than one participant in FGD makes it easier for researchers to uncover in-depth information or facts. Thus, the purposive sampling method was used in selecting interview participants. A heterogeneous group consisting of 7 experts in the fields related to the study was chosen and is as follows:

i. Quranic exegesis: 1 expert
ii. Social science: 1 expert
iii. Science & Technology: 1 expert
iv. Integration of naqli and aqli knowledge: 1 expert
v. Pedagogy: 1 expert
vi. Quranic memorisation: 2 experts (more than one expert is required because the field is the core of the model)

The selection of the experts is based on the arguments of Dalkey and Helmer (1963) and Swanson and Holton (2009), who also stated that experts are knowledgeable, have a deep understanding, and are skilled in a particular field of study.

Analysis of Data

The researcher considered the feedback from experts in the FGD session involved comments and recommendations in designing the IMQVWAK model, which has been constructed based on the literature review. The finding from this FGD is the creation of a prototype model for integrating memorised Quranic verses with aqli knowledge. This model was named Prototype Model 1.

3.4.4 Subphase of Development

The subphase of model development involves developing the model for integrating memorised Quranic verses with aqli knowledge. This subphase used the Fuzzy Delphi Method (FDM) to develop the model, which was designed in the previous subphase (Prototype 1).

Methodology (Fuzzy Delphi Method)

The Fuzzy Delphi Method is an innovation of the Delphi technique (Jamil &

Noh, 2020). The basic concepts of FDM techniques must be understood through the main pillars of the classic Delphi technique concept. The Delphi method was named for its function, which refers to a set of procedures for obtaining and reviewing the views and opinions of a group (usually a panel of experts) on the issue of content authenticity (Noh, 2020).

The FDM is a more effective measurement tool as it can solve problems with ambiguity and uncertainties for a study (Jamil & Noh, 2020). According to Chang et al. (2000), Fuzzy Delphi can process ambiguities regarding the items and predictions and the contents of the respondent's information. They also stated Fuzzy Delphi could explain the individual characteristics of the participants. Among the advantages of Fuzzy Delphi is (Noh, 2020):

1. Reduce the number of surveys and increase the rate of survey recovery.
2. Experts can fully express their opinions, ensuring perfection and consistent ideas.
3. Consider unavoidable ambiguity during the study process.

This method does not misinterpret the original opinions of experts and gives an idea of their actual responses. The Fuzzy Delphi Method obtains a consensus of experts who act as respondents based on quantitative methods.

Rationale

The Fuzzy Delphi Method can be used to gain experts' consensus on a particular problem. The following are studies that have applied Fuzzy Delphi techniques in their studies, such as the determination of teacher competency in teaching and learning management (Jamil et. al, 2014), the requirements of "riadhah ruhiyyah" for the professionalism of teaching in Islamic education (Ramlie et. al, 2014), Facebook framework development (FB) for school curriculum (Noh et. al, 2015); and so on. The use of this technique is also proven to be effective in the usability evaluation of models such as a study conducted by Mohd Nazri Abdul Rahman (2014), Muhammad Ridhuan Tony Lim Abdullah (2014), Abdul Muqsith Ahmad (2018), and Nurulrabihah Mat Noh (2020). Therefore, this study has used the Fuzzy Delphi Method in the model development subphase based on the effectiveness of its use which previous researchers have conducted.

Instruments

A seven-point questionnaire was used to develop the components and elements of the model for integrating memorised Quranic verses with aqli knowledge. Expert questionnaires are useful tools for data collection in the Delphi method when interviewing individuals seems impossible due to time constraints and group arrangement (Dalkey & Helmer, 1963). The questionnaires were developed based on Prototype 1 of the model involving the model's components, phases, subphases, and elements (Appendix J). Table 3.3 shows an example of a questionnaire using a 7-point

Likert scale.

Table 3.3 Example of questionnaire using a 7-point Likert scale

Strongly Disagree	Very Disagree	Disagree	Moderately Agree	Agree	Very Agree	Strongly Agree
1	2	3	4	5	6	7

No	**Methodology of Comprehending Quranic Verses**	**Scale**						
		1	**2**	**3**	**4**	**5**	**6**	**7**
1	Knowing Asbāb al-nuzūl							
2	Knowing Muḥkam and Mutashābih							
3	Feeling the Verse							

Respondent

Experts are respondents or research subjects directly involved in providing information and data to answer research questions in the design and development phase (Jamil, 2016). This study used purposive sampling based on Hasson et al. (2000), which stated that the sample was suitable for studies using the Fuzzy Delphi technique. The selection of experts is based on the following criteria;

1. Knowledgeable in the field (Delbecq et al., 1975; Swanson & Holton, 2009).
2. Experienced in the field. The expert must have at least five years of experience in the studied field (Berliner, 2004).
3. Can give total commitment until the study is completed.
4. Have no personal interest in this review to avoid bias in the study.

Adler and Ziglio (1996) suggested that the number of suitable experts in the Delphi method ranges from 10 to 15 if there is a high level of uniformity among experts. However, Jones and Twiss (1978) suggested that the number of experts involved is 10 to 50 in carrying out the Delphi method. Therefore, in the context of this study, twelve experts in Quranic exegesis were selected to develop the integrating memorised Quranic verses with aqli knowledge model in Kolej GENIUS Insan. The appointment letter as an expert of development has been sent to the experts (Appendix K).

Data Analysis

There are two main points in the Fuzzy Delphi Method (FDM): Fuzzy triangular number and the defuzzification process.

The Fuzzy triangular number consists of the values m_1, m_2, and m_3, where m_1 represents the smallest value, represents the most reasonable value, and m_3 refers to the maximum value. These three values in the Triangular Fuzzy Number can be seen in Figure 3.3, showing the mean triangle graph against the triangular value. Figure 3.3 shows that these three values are also in the range of 0 to 1 and correspond to Fuzzy numbers (Jamil & Noh, 2020).

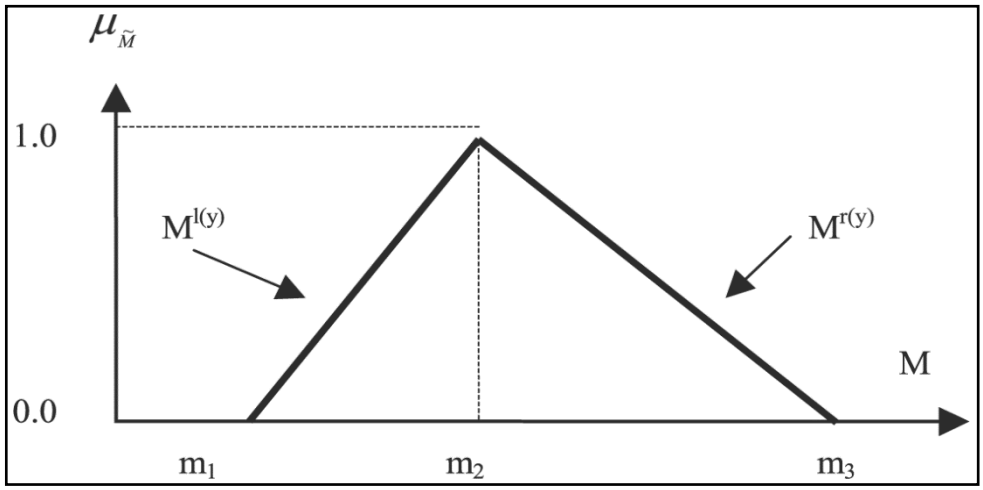

Figure 3.3 Mean Triangle Graph Against the Triangular Value

At the triangular Fuzzy number level, two conditions must be complied with to determine the acceptance of an element studied by the expert consensus: 1. condition involves threshold value (d) 2. condition is the percentage of the expert group for an element. This threshold (d) is based on a formula that has been set. The procedure section for conducting the study using the Fuzzy Delphi Method (FDM) on the next subtopic will describe these two conditions.

The defuzzification process determines the ranking of each construct, component, element, issue, variable, and sub-variable found in the study. This process aims to help researchers see the level of requirement of a variable and the sub-variables. It can also be used to determine the ranking and priority of each element studied. This ranking process will help produce data according to requirements based on the consensus of experts who act as respondents to the study. Three formulas can be used in the defuzzification process. Researchers can choose any of these three formulas to determine the ranking in their research. The three formulas in this process are as follows:

i. $A_{max} = 1/3 * (a_1 + a_m + a_2)$

ii. $A_{max} = 1/4 * (a_1 + 2a_m + a_2)$

iii. $A_{max} = 1/6 * (a_1 + 4a_m + a_2)$

In the defuzzification process stage, there is also a requirement to indicate the acceptance of the expert group for an element studied where the use of median value, also known as the alpha-cut (α-cut) value, is used. The details about the Fuzzy triangular number and defuzzification process are described in the next subtopic.

Research Procedures

Some procedures must be followed to obtain the study's findings using the Fuzzy Delphi Method (FDM) approach. Compliance with this procedure can get empirical findings. Figure 3.4 shows the flowchart of the study procedure using the Fuzzy Delphi (FDM) method.

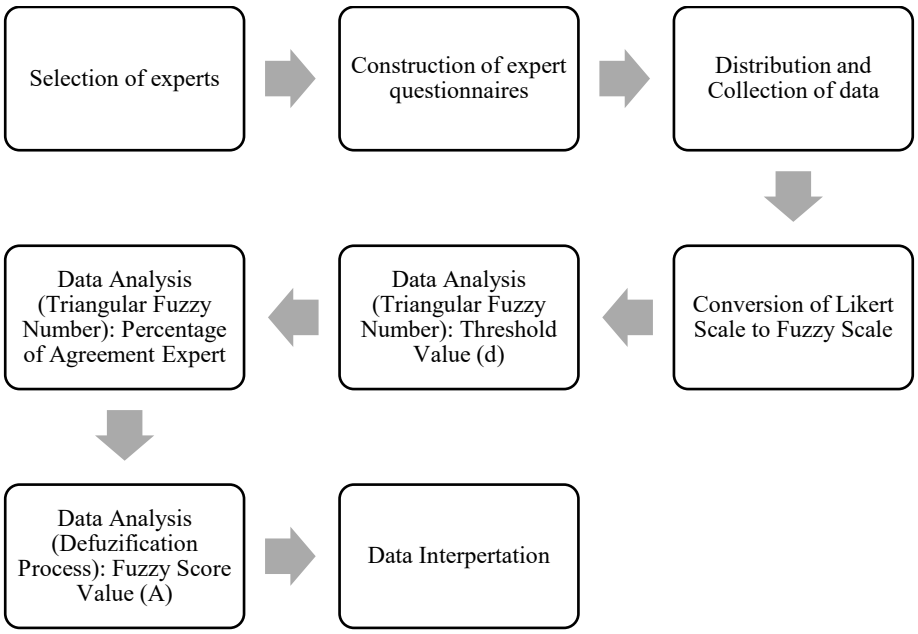

Figure 3.4 Fuzzy Delphi Method (FDM) Procedure Flowchart

Figure 3.4 shows the flowchart procedure using the Fuzzy Delphi Method (FDM) to obtain expert agreement. The description of this flowchart is as follows:

Step 1: Determination and selection of experts involved in the study context. The selection of experts is crucial in ensuring that the experts selected can provide accurate insights into the study's context.

Step 2: Development of an expert questionnaire is carried out. In this process, the development of questionnaires can be conducted through several methods, i.e., (1) interview; (2) discussion through focus group; (3) development through document analysis and literature review; and (4) open-ended format questions.

Step 3: For the process of dissemination and data collection, several approaches can be used either through (1) workshop seminars by inviting the experts

involved; (2) Meetings with experts individually; or (3) Dissemination of questionnaires to selected experts via e-mail, etc.

Step 4: Convert all linguistic variables into Fuzzy triangular numbers. Assume that the Fuzzy number r_{ij} is a variable for each criterion for expert K for i= 1,....., m,j=1,.....n, k=1.....,k and $r_{ij} = 1/K (r^1_{ij} \pm r^2_{ij} \pm r^K_{ij})$. Table 3.4 shows the linguistic variables of 7 scales, where it displays the measurement statement of an item and the Fuzzy scale value it represents.

Table 3.4 7-point linguistic variable scale

Linguistic Variable	***Fuzzy* scale**
Strongly Disagree	(0.0, 0.0, 0.1)
Very Disagree	(0.0, 0.1, 0.3)
Disagree	(0.1, 0.3, 0.5)
Moderately Agree	(0.3, 0.5, 0.7)
Agree	(0.5, 0.7, 0.9)
Very Agree	(0.7, 0.9, 1.0)
Strongly Agree	(0.9, 1.0, 1.0)

There are also other examples of linguistic variables whose variables are changed according to the objective requirements of the study. This can be seen in Table 3.5, which shows the linguistic variables are based on the needs from “very low” to “very high”. This linguistic variable is often used to compare an item in a study.

Table 3.5 Scale linguistic variables to see levels

Linguistic Variable	***Fuzzy* Scale**
Very low	(0.0, 0.0, 0.1)
Medium low	(0.0, 0.1, 0.3)
Low	(0.1, 0.3, 0.5)
Medium	(0.3, 0.5, 0.7)
High	(0.5, 0.7, 0.9)
Medium high	(0.7, 0.9, 1.0)
Very High	(0.9, 1.0, 1.0)

Step 5: Analysing the data based on the Fuzzy triangular number to obtain threshold value (d). Therefore, the first condition to be complied with is the threshold value (d) must be less or equal to 0.2 (Cheng & Lin, 2002). The use of the vertex method is carried out to calculate the distance between the average r_{ij}. Threshold values (d) of two Fuzzy numbers m = (m_1, m_2, m_3) and n = (m_1, m_2, m_3) are counted using the formula:

$$d(\tilde{m}, \tilde{n}) = \sqrt{\frac{1}{3}\left[(m_1 - n_1)^2 + (m_2 - n_2)^2 + (m_3 - n_3)^2\right]}$$

Table 3.6 displays the example threshold value (d) generated for three items studied based on the views of 12 experts. This table shows threshold values for each item and experts set the overall threshold (d) value for each item. A blacked threshold (d) value is a threshold value (d) that exceeds 0.2.

Table 3.6 Example of the threshold value (d) for 3 items and 12 experts

Table 3.6 Expert	Item		
	1	**2**	**3**
1	0.059	0.110	0.072
2	0.059	0.045	0.072
3	0.059	0.045	0.072
4	**0.300**	0.045	0.072
5	0.095	0.045	0.082
6	0.059	0.045	0.082
7	0.095	0.045	0.082
8	0.095	0.045	0.082
9	0.095	0.045	0.082
10	0.095	0.045	0.082
11	0.095	0.045	0.082
12	0.059	**0.347**	**0.311**
Each item *Threshold* value (d)	0.101	0.027	0.073

Step 6: In this process, the determination of the second condition is carried out, in which the percentage of expert consensus is determined. The second condition to be complied with is that the percentage value of the expert consensus must be equal to or more than 75.0% (Chang et al., 2011). Table 3.7 displays the percentage of expert agreements for the three items studied using the consensus of 12 experts.

Table 3.7 Example of expert consensus percentage

Item	Item		
	1	**2**	**3**
Number of Item d ≤ 0.2	9	9	9
Percentage of each item d ≤ 0.2	90.0%	90.0%	90.0%

Step 7: Analysing the data using the average of Fuzzy numbers @ average response (Defuzzification Process). This analysis is aimed at obtaining a Fuzzy score (A). To ensure that the third condition is complied with, the Fuzzy score (A) must exceed or equal to the median value (α – cut) of 0.5

(Bodjanova, 2006). This indicates that such elements are accepted by expert agreement. Among other functions, the Fuzzy score value (A) can be used as a determinant of the positioning and priority of an element according to the expert consensus view. The formula involved in getting a Fuzzy score (A) is as follows:

$$A = (1/3)*(m_1 + m_2 + m_3)$$

Table 3.8 displays the examples of Fuzzy score values (A) conducted using defuzzification process analysis based on the Fuzzy Delphi Method.

Table 3.8 Example of Fuzzy score value (A)

Item	**1**			**2**			**3**		
Average of each Element	m_1	m_2	m_3	m_1	m_2	m_3	m_1	m_2	m_3
	0.780	0.930	0.990	0.880	0.990	1.000	0.820	0.960	1.000
Fuzzy Score Value (A)	0.900			0.957			0.927		

Only items with a Fuzzy score value above 0.5 will be accepted, and the highest Fuzzy score value determines priority ranking.

The finding from FDM is the development of a prototype model for integrating memorised Quranic verses with aqli knowledge. This model was named Prototype Model 2.

Validity and Reliability

The researcher used face validity to ensure that the questionnaires analytically and linguistically look like what should be measured as suggested by Taherdoost et al., (2016). As far as this study is concerned, it used expert assessment techniques involving four experts, two experts in the content and two in the language. These experts evaluated the instrument based on their expertise (Appendix L). The instruments were then improved based on comments from assessors and distributed to development experts for the FDM session.

3.5 Phase 3: Usability Evaluation

3.5.1 Purpose

This phase aims to look at the suitability and usability of integrating memorised Quranic verses with aqli knowledge model to be used as a guide by teachers and students in implementing it in the teaching and learning process. This study focused only on the internal validation of the model proposed by Richey (2005), which looks at the components' and elements' suitability. This phase is carried out to answer the question of the study: "What is the usability of the model of integrating memorised Quranic verses with aqli knowledge in Kolej GENIUS Insan?".

3.5.2 Methodology (Nominal Group Technique)

This study used the Nominal Group Technique (NGT) to evaluate the usability of the model of integrating memorised Quranic verses with aqli knowledge. NGT is a structured group face-to-face meeting technique to obtain group consensus (Varga-Atkins et al., 2011). The data collection process can be semi-quantitative and structured (Jamil & Noh, 2020). This technique is more focused on the semi-quantitative approach as it involves merging the qualitative method. This is because this technique began with the process of "accepting ideas without assessment" (qualitative), then followed by the process of rating or order of priority ideas (quantitative) (O'Neil & Jackson, 1983).

The advantage of the NGT technique is the opportunity to balance the role of all study participants, in contrast to the group discussion that may have dominant participants and thus have a significant impact (Jamil & Noh, 2020). Some participants' dominance will hinder other participants' responses (Denscombe, 1995). On the other hand, the NGT technique disguises each study participant's view by allowing the participants to present their ideas in the voting process.

3.5.3 Instrument

This phase used a questionnaire developed based on the findings from the design and development phase (Prototype 2 of the model). The questionnaire was published based on recommendations related to the internal validation of the model,

divided into the suitability of the components, phases, subphases, elements, and sequence of elements (Appendix M). This questionnaire was presented in a workshop with a group of experts using NGT techniques. The results of this questionnaire were analysed using Microsoft Excel based on the formula that has been set.

3.5.4 Participant

The evaluation of a developed product can be measured in its applicability based on the opinion and satisfaction of a person who is well-versed in his field (Jeng & Tzeng, 2012). This phase involved a face-to-face workshop with a group of experts. This is in line with Richey's (2005) view that experts can be used in the model's usability assessment phase depending on the desired data tendency. The experts should be selected based on their expertise and knowledge to provide the best results for the ongoing study (Noh, 2020). Thus, in this study, experts in Quranic studies were selected based on their knowledge to evaluate the suitability of the prototype model.

Jamil and Noh (2020) stated the polemic about the number of study participants in this technique that is very subjective as it depends on the expected findings of the study. According to Jamil (2016), some scholars mentioned the number of study experts involved is 5 to 9 people (Van de Ven & Delbecq, 1971), 9 to 12 experts (Allen, Dyas & Jones, 2004), and 6 to 12 people (Harvey & Holmes, 2012). Even Dobbie et al.'s (2004) study involved 30 to 40 study experts, Williams et al.'s (2006) study a total of 92 experts, and Perry and Linsley's (2006) study involved 36 experts. For this study, nine experts are involved as research participants. The rationale for selecting these

experts is that they are knowledgeable in Quranic studies. The appointment letter as an evaluation expert has been sent to the experts (Appendix N).

3.5.5 Procedure

NGT was developed by Delbecq et al. (1975). However, NGT underwent several modifications over time and adapted according to the study context (Jamil & Noh, 2020). Despite the changes, the basic principles that are the pillars of the NGT process are still maintained, which are; (1) the identification of problems through discussion; and (2) the voting process. Hence, based on the context of this study, the NGT process is carried out as follows (Jamil & Noh, 2020);

i. Description of the study
ii. The brainstorming process by study participants
iii. Sharing ideas between study participants
iv. Discussion of items, themes, and elements of the issue
v. Voting process

The NGT session among the experts was held in a workshop. The NGT process began with the researcher cum moderator explaining the study to the participants to clarify the workshop's purpose. Then the moderator presented the prototype model of integrating memorised Quranic verses with aqli knowledge. The model shown is intended to guide the experts to start the NGT session. The NGT process continued with the experts sharing and discussing the model presented.

At this stage, experts can express their views and ideas, change the structure of the model, its component, or elements, and decide whether to retain or reject something irrelevant to the study's context. The components and elements that achieved mutual agreement were selected and incorporated into the model. This phase also allows experts to present ideas that feel relevant and necessary. The NGT process ends after all experts vote on the elements that have been listed (Jamil, 2016; Noh, 2020). Table 3.9 shows the construction of an analysis template involving nine study participants and four elements to be voted on using a 5-point Likert scale, as shown in Table 3.10.

Table 3.9 Example of analysis template for 9 experts in NGT

No	Element	Expert								
		1	2	3	4	5	6	7	8	9
1	Knowing Asbāb al-nuzūl									
2	Knowing Muḥkam and Mutashābih									
3	Feeling the Verse									

Table 3.10 5-point Likert scale in the NGT voting process

Scale	Level of Agreement
Scale 1	Strongly Disagree
Scale 2	Disagree
Scale 3	Moderate
Scale 4	Agree
Scale 5	Strongly Agree

3.5.6 Data Analysis

There are various ways of interpreting score data for the Nominal Group Technique (NGT). Among the acceptance ranges for measurements in NGT that are always used is that the percentage of score value must be 70.0% and above. This range is in line with some scholars' views in their argument; the acceptance rate of an element

measured in its usability is based on the percentage of score value of at least 70.0% based on the views of the study participant (Jamil, 2016).

Table 3.11 shows examples of findings analysis using NGT consisting of assessed items, group score, percentage, ranking, and evaluation status.

Table 3.11 Example of analysis based on NGT

Item	Total scores of study participants (n=9)	Percentage (%)	Ranking	Evaluation status
1	37	82.2	3	Appropriate
2	39	86.7	2	Appropriate
3	40	88.9	1	Appropriate
4	30	66.7	-	Rejected

The NGT technique can also determine the position of each element studied based on the percentage achieved depending on the objective (Jamil & Noh, 2020). In this study context, the researcher sorted the position of each item based on the highest percentage achieved for the specific elements in the model.

3.5.7 Validity and Reliability

The validity and reliability of the Nominal Group Technique can be enhanced by determining the criteria for selecting group members that genuinely represent a generalised group, performing pilot studies, and determining correct discussion questions (Jamil & Noh, 2020). In this study context, the researchers selected the experts of evaluation among individuals with knowledge in the field of study, and the

majority of experts are executors at Kolej GENIUS Insan. In addition, the discussion questions are about the suitability of the prototype model developed in the previous design and development phase. Therefore, the discussion questions are appropriate, and conducting a pilot study is not needed.

3.6 Conclusion

Overall, this chapter explains the research methods that were used in conducting this research. There are three phases in DDR. The interview method was used in the need analysis phase. The Focus Group Discussion (FGD) and Fuzzy Delphi Method (FDM) were used in the design and development phase, and the Nominal Group Technique (NGT) method was applied in the usability evaluation phase of the model. The research sampling and instruments for each phase have been detailed. Further, the data collection procedure and analysis are explained. Finally, the trustworthiness, validity, and reliability are described.