

CHAPTER III

RESEARCH METHODOLOGY

3.1 Introduction

Research methodology is a vital procedure of research to ensure proper and valid research findings. The methodology is used to resolve issues contained in research questions to meet the designated objectives. This chapter discusses the design of the study, data collection technique, data sampling and research instrument and study etiquettes.

3.2 Design of the Study

This study aims to develop a model of Quranic teaching for the elderly. By principle, the study employs the pragmatic type of research, based on the Design and Development Research approach (Richey & Klein, 2007). This study is also known as design developmental research (Richey & Kline, 2007; Van den Akker, 1999). In general, the researcher chooses DDR as the approach in designing and development model because it is similarly suitable for design and development approach in various fields of study, for instance, learning strategy, program development, model development and product development (Flink & Searns, 1993; Ulrich, Eppinger & Goyal, 2011).

Overall, Richey and Klein (2007) affirm that this method incorporates three systematically phases, which are the needs analysis phase, design and development phase and evaluation phase. This method is able to assist the researcher to design a certain study while applying multiple instruments and research methods corresponding to the incorporated phases.

DDR approach is a study consisting of design, development and evaluation process to form the empirical base in developing products, tools, models or improvisation that leads to expansion or innovation of particular products. This method by means incorporates four comprehensive phases (Richey & Klein, 2007). Those phases are:

- 1) First phase: Needs analysis phase
- 2) Second phase: Design and development phase
- 3) Third phase: Evaluation and usability phase

Table 3.1: Model Development Phase and Suggestion Methods (Saedah Siraj et al., 2013)

PHASE	APPLICABLE METHODS
Phase 1: Needs analysis	• Interview • Survey • Content analysis • FGD • Observation • Testing
Phase 2: Design and Development	• Traditional Delphi technique • Fuzzy Delphi method (FDM) • Interpretive Structural Modelling (ISM) • Structural Equation Modelling (SEM) • Analytical Hierarchical Processing (AHP) • Content Analysis • Social Networking Analysis (SNA)
Phase 3: Evaluation and usability	• Interview • Survey • Quasi-Experiment

	• Fuzzy Delphi method (FDM) • Quasi Experiment • Single Group Experiment
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Richie and Klein (2007) put studies employing the DDR method into several types of classification. The first type is product-oriented design development research, while the second type is model study. The first type of study implies the creation of products that can be touched and held (tangible). In the study, a specific conclusion on the particular product will be made whether it meets the objectives, requirements, strengths and weaknesses of the create

The second type of study is model-conceptual by nature, which encompasses making conclusions and observations on procedures, processes and situations supporting the usability of the created model. Thus, the model Quranic of teaching for the elderly falls into the second type of study, which is conceptual by nature. The DDR method of study incorporates several key processes, which are requirement analysis, context analysis, user analysis, content analysis, and most importantly the usability evaluation of the created product (Saedah Siraj et al., 2013).

In short, the DDR approach in the study would facilitate the researcher in designing and developing a particular study. DDR application could also be innovated with multifaceted instruments corresponding to its incorporated phases. There is a variety of products and results that could be produced out of this technique - models, modules, questionnaire forms, frameworks, guidelines, strategic plan and mission - based on the requirements of the pertaining study. Therefore, this design is very suitable

for the researcher, in regards to the purpose of this study, which is to develop a model of Quranic teaching for the elderly. In general, this study is based on three main phases:

Phase one: Requirement analysis or needs analysis, the phase to identify the needs in developing the model of the study. As the study of the Quranic teaching of the elderly is relatively new, the interview method is more suitable for deeper data. In addition, this method is the most appropriate compared to questionnaires because informants are consists of the elderly. Involved interview with nine informants; six experts and three elderly people who are learning al-Quran.

Phase two: The major phase of this study, which is the design and development phase. To create the instrument of questions, the researcher interviewed 10 experts in teaching al-Quran for the elderly to attain their experience and methods of teaching al-Quran. This method is the most suitable because of poorly written information about teaching al-Quran for the elderly people due to the lack of literature review and they are not documenting the experience. Thus, interviewing a few teachers of al-Quran will contribute to the variation of method and knowledge. After that, the session of FGD (focus group discussion) was conducted to debate and discuss the items before the question. This session involved eight experts from a variety of expertise. Then, the instrument was validated by four experts in the language and al-Quran fields before expanding to 15 experts for the Fuzzy Delphi process. The Fuzzy Delphi Method was employed to analyse the most important element and consented element by the experts.

Third phase: The final phase, model evaluation phase that employed NGT (Nominal Group Technique), involved six experts (Harvey & Holmes, 2012) . NGT is one of the

methods to evaluate a model using scale-rating and verbal evaluations. Data analysis will be measured in the format of NGT.

3.3 First Phase: Needs Analysis

Phase purpose. In the DDR approach, the first phase is to study the needs to develop a model of Quranic teaching for the elderly.

This phase is conducted to answer the following research question:

Is there any need to develop a model of Quranic teaching for the elderly?

- i. What are the challenges faced by the elderly in learning al-Quran?
- ii. Is there a need to develop the model of Quranic teaching for the elderly?

Within this phase, the applied instrument to gather data on the requirement of developing this model is the interview method. It is among the important phases seemingly the researcher will be able to answer each research question imposed in the development of the model (Ridhuan et al., 2014). Within this phase, certain required analysis questions will be formed out of the literature review.

According to McKillip (1987), the analysis phase involves the identification and evaluation of the required aspects intended to be studied, which will determine the intended results. The needs' identification and analysis process is also recognised as the process to identify existing problems within the target population. This process also involves identifying best solution method able to be employed by the researcher (Witkin & Altschuld, 1995).

In addition, McKillip (1987) suggests several models that can support the requirement analysis:

- i. **Discrepancy Model:** This model is used predominantly in the field of education. It emphasises several forecasts, which are the process of objective setup and determining what should be done. Secondly, the process of performance measurement, involving in determining what should be done. Thirdly, the process of discrepancy identification, that is what is ought to be what is the problem actually.
- ii. **Marketing Model:** This model emphasises the process of analysing needs and the feedback employed by a certain institution or organisation to assess customers' demands.
- iii. **Decision Making Model:** It is a model adapted from the Multiattribute Utility Analysis (MAUA). This model comprises of three phases, namely the problem identification, analysing and constructing actions, and projecting the requirement index to investigate the actual requirement of a product.

Therefore, for the first phase, the need analysis phase, the researcher employed the discrepancy model to support addressing the research question for the first objective - what are the challenges faced by the elderly in learning al-Quran, and is there a need to develop the model of Quranic teaching for the elderly.

3.3.2 Data Collection Technique

a. Interview

Interviews with experts are conducted to acquire the validity of the needs for the model's development. The interview method is a widely applied method to acquire in-depth opinions regarding internal perception, attitudes and behaviours, as well as the actual feeling of a person (Cohen et al., 2007). The interview is divided into three major categories, which are structured interview, semi-structured interview, and unstructured interview (Merriam, 2016). To gather data for this research, the researcher employed the semi-structure interview method.

The instrument for interviews is open-ended questions for the researcher receive deep information from the samples of which they might not be acquired through surveys (Cresswell, 2003). Besides that, open-ended questions facilitate the researcher in terms of acquiring and analysing the gathered information (Richie & Klein, 2007). According to Merriam (2016), the application of open-ended questions is more flexible, explorative and suitable in the case where the researcher has less knowledge on the actual issue or phenomenon wished to be explored. Apart from that, by applying open-ended questions, it helps to give additional information required by the researcher (Van den Akker, 1999). Phrased question items in open-ended questions form are meant to discover and triggers a person to actively respond based on their experiences regarding a certain issue. After the questions are distributed to the selected respondents (experts), the obtained information will be transcribed by transcription coding.

3.3.3 Validity

Face and content validity is the procedures that need to be adhered to by the researcher prior to conducting the study. Content validity determination refers to the competency of the research instrument in containing information comprising components of the study field (Cresswell, 2003; Chua, 2006; Pallant, 2001). The constructed question set of the interview is based on previous studies and was then validated by experts for face validity and language validity to avoid misunderstandings. Three lecturers in al-Quran at USIM were involved in validating the question and the researcher had improved the highlighted mistakes before the interview session. The interview questions will be distributed several days in advance before the session for preparation from the experts' side. Following the interview session, the researcher transcribed the data and conducted face validity by submitting the transcribed data to experts for purpose of validating each conversation to avoid data deviations.

3.3.4 Research Samples

In this study, the researcher also distributed open-ended questions to nine informants, six experts and three informants of elderly students who are learning al-Quran. They were selected by purposive sampling to gather their opinions on the requirements of developing a model of Quranic teaching for the elderly. The associated experts comprised of four experts from the elderly Quranic teaching field, one *da'wah* and elderly expert, one expert from the nursing home's management, and another three from among the elderly. The researcher choose the elderly and teacher from these three types of place; first is a government-supervised facility, which is Rumah Seri Kenangan, Cheras, second from elderly who enrol in the al-Quran class at Masjid Abu Bakar, Kuala

Lipis, and lastly, the elderly who is learning in a private class al-Quran named Madrasah Orang Pencen in Nilai.

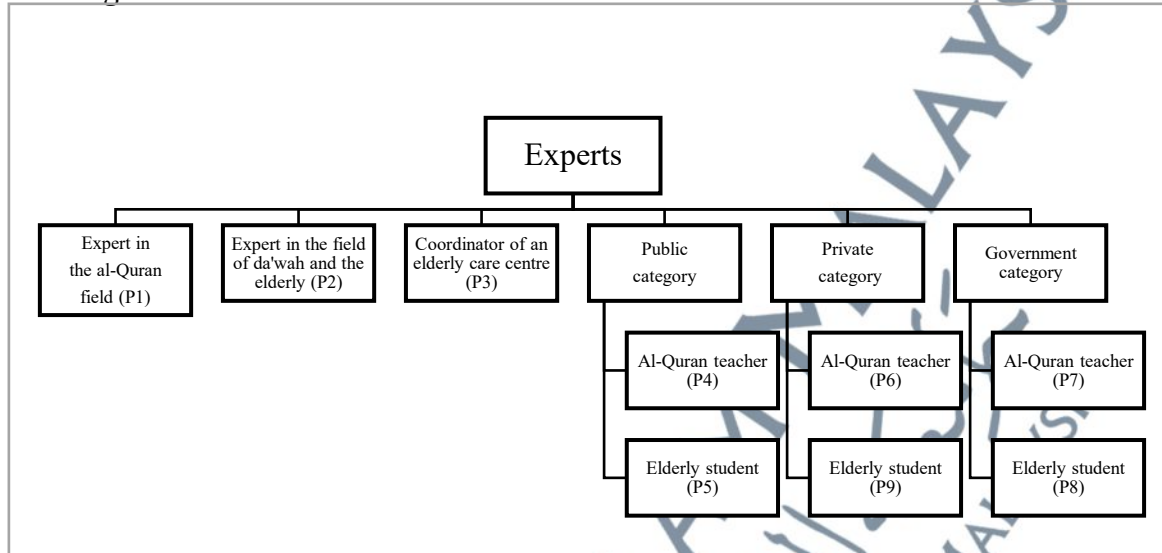


Figure 3.1: Summary of Experts in Phase One

The figure above indicates three informants as the professionals in the fields of al-Quran and the elderly. While three other informants are experts of the field who are al-Quran teachers teaching the elderly. The remaining three informants are the elderly who enrol in al-Quran classes at various facilities. The following discussions provide deliberate explanations of the experts and the justification behind their selection.

For the elderly and al-Quran teachers, the researcher classified them into three categories, which are the individuals in public, private and government sectors. These categories are discussed as follows.

Public Category: The elderly are categorised as the individual residing in their own house and learning al-Quran in the *masjid*. The selection of such elderly in this phase involved *masjid* in the village area. Therefore, the researcher had chosen a *masjid*

located in Kuala Lipis, Pahang to investigate the gap of difference in terms of life background, thoughts as well as economy, between the elderly living in the village with the city. Hence, the selection for an al-Quran teacher in Kuala Lipis was made based on their five years of experience in teaching al-Quran to the elderly.

Private Category: The elderly in this category refers to those with the economic and physical capabilities to attend paid al-Quran classes. The private learning class chosen in this research is Madrasah Orang Pencen which is located in Negeri Sembilan. An al-Quran teacher from this *madrasah* was also involved in the interview to find the answer to the research question in the first phase. The justification for selecting this *madrasah* is due to its 10 years of operation and have developed their own module in teaching al-Quran to the elderly. In addition, the participating students had also provided positive responses to the approach adopted by the teachers.

Government Category: The researcher involved the elderly and an al-Quran teacher from Rumah Seri Kenangan in acquiring relevant information under this category. The decision to involve this facility is because of the occupants' distinctive background from those from public and private categories. It is to be noted that the occupants here are placed through the court order after they were rescued from being homeless; they used to live under the trees, bridges as well as on the pavement alongside the streets of Kuala Lumpur. Therefore, the employed approach and method of teaching here are different from the elderly in the village and the city.

Table 3.2: Experts for the First Phase, Needs Analysis

Professional Experts Category	
Panel 1	A lecturer of al-Quran and sunnah studies, teaching al-Quran to the elderly
Panel 2	A lecturer of <i>da'wah</i> and Islamic civilisation, teaching al-Quran to the elderly
Panel 3	A director of an elderly nursing home
Industry Expert (Public) Category	
Panel 4	Al-Quran teacher for the elderly in public at a <i>masjid</i>
Panel 5	Retired nurse and elderly student learning al-Quran
Industry Expert (Private) Category	
Panel 6	A principal and al-Quran teacher for the elderly at private classes
Panel 9	A retired principal and elderly student learning al-Quran for more than two years
Industry Expert of Government Elderly Nursing Category	
Panel 7	An al-Quran teacher for the elderly and Islamic Affairs Officer at Rumah Warga Emas Seri Kenangan
Panel 8	An elderly, occupant in Rumah Warga Emas Seri Kenangan

This table indicates the interview coding matrix prescribed before being scrutinized with the method of inductive analysis (Cresswell, 2003) and subsequently identifying respondent's theme of interaction on each answer given.

3.3.5 Data Analysis

To analyse the data from the interview in this first phase, Sabitha (2005) suggests six processes involved in analysing data from the interview. Firstly, content analysis, where the acquired data will be gathered by transcribing. Secondly, the data will be classified by themes to answer research questions. Thirdly, data coding, which purportedly to analyse the transcribed data from the interview and later will be coded according to prearranged themes. Fourthly, organising data into a table of analysis whereby this process involves analysing the coded data by the table of analysis. Fifthly, identifying issues by the formation of prearranged themes and patterns. A certain issue is identifiable through the themes spotted in the interview's transcription. The data from the interview will be validated by experts (Kamarul Azmi Jasmi, 2012) and classified into themes to find out the challenges and requirements in developing the model of Quranic teaching for the elderly.

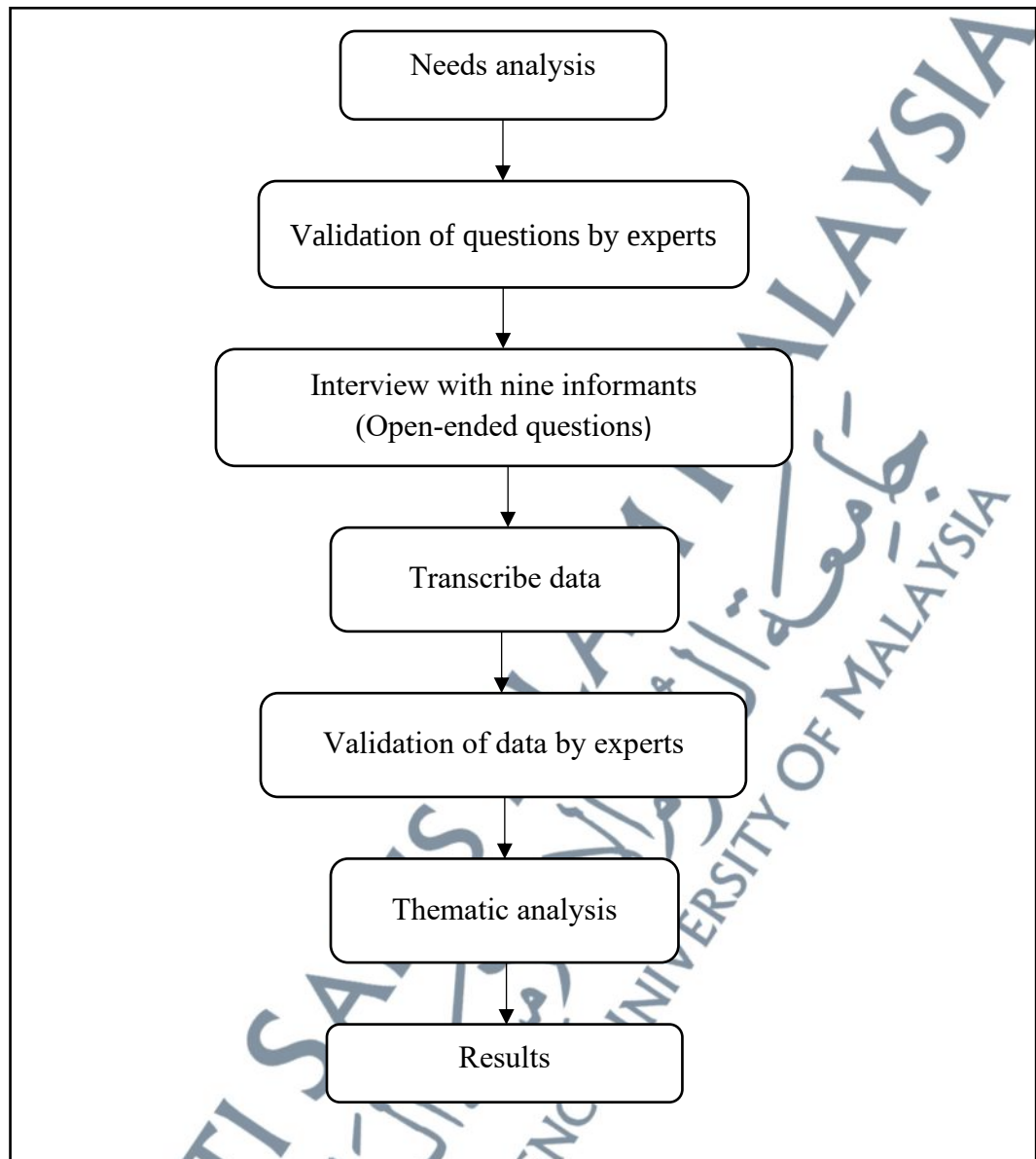


Figure 3.2: Process of Needs Analysis for the First Phase

3.4 Second Phase: Design and Development

Phase purpose. The focus or main purpose of this phase is to design and develop a model of Quranic teaching for the elderly. This is the crucial phase for the study. Fuzzy Delphi Method was applied in this phase to gain consensus and agreement from experts. This phase purposes to answer this research question:

How to develop the model of Quranic teaching for the elderly based on the following aspects?

- i. What are the required model elements in designing the model of Quranic teaching for the elderly?
- ii. Is there any consensus by experts on the aspects that should be included in the model of Quranic teaching for the elderly?

3.4.1 Data Collection Technique

After the questionnaire was validated by four experts, the questionnaire will be distributed to 15 experts to get the consensus on whether the development of the model should remain, be removed or there is an element to be added. Once data is acquired, the researcher put it into analysis by applying the Fuzzy Delphi Method. Based on the acquired data, the researcher transformed all Likert scales into Fuzzy scales. The gathered data was then analysed with Microsoft Excel software. Responds and feedback from experts will be remarked and taken into improvisation in the questionnaire.

For this phase, the researcher employed the Fuzzy Delphi technique that is based on the related opinions from experts. This technique is deemed appropriate to the aim of this phase, which is seeking detailed evaluation of the developed model. The Fuzzy

Delphi Method is a method and measurement instrument that has gone a rebranding from the Delphi Technique. This method was introduced by Murray, Pipino and Gigch in 1985. Fuzzy Delphi Method is an assemblage of Fuzzy Numbers and Delphi Technique. This means that the Fuzzy Delphi Method is not a new instrument but in fact an improvised version of the Delphi Method. The improvisation indirectly makes the Fuzzy Delphi Method a more effective measuring tool due to its capability in resolving ambiguous problems in a study.

3.4.2 Research Samples

In this phase, the researcher employed the Fuzzy Delphi Method and purposive sampling. According to Hasson, Keeney and McKenna (2000), the sampling method suitable with FDM is non-probability sampling, either purposive or criterion sampling. This method is selected with regards to the preselected samples and their representativeness, and they are chosen based on the purpose to observe their in-depth knowledge and experience in the studied area. According to Merriam (2001), purposive sampling is also explained by selecting study participants purposively is very good because they are able to provide information to the point where there is no more new information or the information overlaps. To evaluate the model's construct and elements, the researcher had selected 15 experts from a variety of disciplines according to their expertise. The type of expert is heterogeneous when the expert come from multiple expertise (Gordon, 1994). Due to the fact that the developed model is concerning the elderly, thus, three experts from the field of gerontology were also selected. To acquire data pertaining to al-Quran teaching to the elderly, the researcher

considered the teachers who are teaching the elderly and the remaining are those with direct involvement with the management of the elderly nursing homes.

Table 3.3: Experts for the Second Phase, Design and Development Phase

Experts	
Panel 1	A lecturer in al-Quran studies and teaching the elderly
Panel 2	A lecturer in al-Quran studies and founder of a Quranic class model for adults in Terengganu
Panel 3	A lecturer in Islamic education and founder of an education and nursing home for the elderly
Panel 4	A lecturer in Islamic education and teaching al-Quran for the elderly
Panel 5	A lecturer in <i>da'wah</i> and gerontology
Panel 6	A lecturer in gerontology
Panel 7	A lecturer in Islamic education and teaching al-Quran for the elderly
Panel 8	A principal and teaching al-Quran for adults in Kuala Lumpur
Panel 9	A founder of private al-Quran class for adults in Bangi
Panel 10	A teacher of al-Quran for the elderly and a <i>masjid bilal</i> in Kelantan
Panel 11	<i>Takmir</i> and <i>fardh 'ain</i> teacher at an elderly nursing home in Negeri Sembilan
Panel 12	Al-Quran teacher for the elderly in a <i>masjid</i>
Panel 13	A lecturer in <i>Qiraat</i> and teaching al-Quran for the elderly
Panel 14	A coordinator of an elderly nursing centre
Panel 15	An elderly student of al-Quran in a private class

The above table exhibits 15 experts involved in developing a model of Quranic teaching for the elderly. The majority of them are experts with knowledge in al-Quran along with experience of more than five years in teaching it to the elderly. An expert specialising in gerontology was also involved to assess whether the constructed items acknowledge the requirements of the elderly. Besides that, the elderly learning al-Quran were also involved so the items constructed meeting their needs and preferences.

Experts Criteria

Berliner (2004) asserts that lecturers with over five years of experience are classified as experts, whereby they have continuous experience in teaching and management. According to Mullen (2003), experts are those who are trained in certain disciplines. Meanwhile, Akbari and Yazdanmehr (2014) state the term 'experts' in the education field refers to individuals with over five years of experience and based on their experience in specific. According to Ridhuan et al. (2014), the Fuzzy Delphi Method which involves the development of models, gaining consensus and agreements from experts is a must.

Adler and Ziglio (1996) affirm the appropriate number of experts for Delphi methods is around 10 to 15 people if the consensus is high among them. Clayton (1997) states that the suitable number of experts is between 5 to 10, however, the 'rule of thumb' in the Delphi technique's sampling amount of 10 to 15 is normally sufficient. Apart from that, Cavalli and Ortolano (1984) assert the samples for FDM between 8 to 12 as sufficient, in case the samples are homogenous in nature, similar to an opinion by Philip (2000) which affirm the experts' sample between seven to 12 peoples. Jones and

Twiss (1978) suggest the suitable number of experts in this method as 10 to 50 people. However, the researcher will appoint 15 experts in this phase based on their respective prowess.

3.4.3 Research Instrument

Before FDM was conducted, the first step is to construct the questionnaires or the instrument. The researcher constructed the research instrument for the model's design and development phase based on the interview with experts. According to Skulmoski, Hartman and Krahn (2007), the instrument can be formed based on literature highlights, pilot study and experience. While according to (Ridhwan et al., 2014), to form questions for the Fuzzy Delphi technique based on items below:

- i) Previous studies
- ii) Interview with experts
- iii) Focus group discussion

Hence, in building the elements of the model, the researcher adopted all methods. The followings are the methods adopted for the purpose of designing the model of Quranic teaching for the elderly.

i. Previous Studies Method

To build the elements of the model, the researcher adopted previous studies' method in gaining the foundation of the element build-up. These studies cover the topics associated with the needs in developing a model for the elderly. Moreover, the development of the model in research is also based theories of Quranic teaching for the

elderly (figure 1.2 page 19). The figure below demonstrates the fundamental elements required to be met to facilitate the model of Quranic teaching for the elderly.

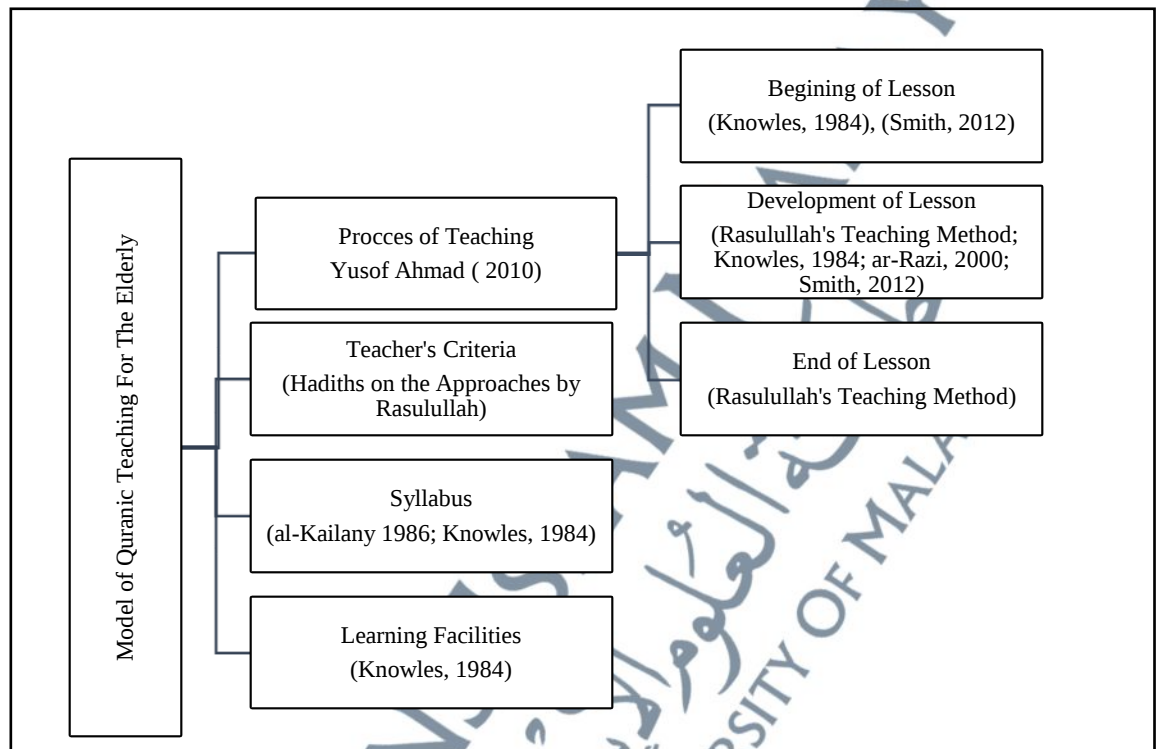


Figure 3.3: Recommendation of Elements and Constructs by Experts

This model's construction framework is based on Zetty Nurzuliana Rashed's (2015) teaching of Quran recitation, which places four basic aspects in the teaching of Quran, including teaching method, teacher criteria, syllabus, and learning facilities. While the learning process is taken on Yusof Ahmad's (2010) theory. Constructs and items were developed in each element based on past research, selected theories, and interview findings from the first phase. These ideas were then validated by experts during FGD sessions in order to construct FDM instruments.

ii. Interview with Experts

After the elements were built based on previous studies and findings from the first phase, the researcher attempted to gather items for the built constructs from previous studies, only to find out the limitation of materials discussing the elderly education, especially in the field of al-Quran. Previous studies only focused on the teaching of al-Quran for students in primary schools and secondary schools. Hence, in gaining in-depth and precise data, the researcher had conducted interviews with 10 al-Quran teachers that are specifically teaching al-Quran to the elderly. The researcher had set the minimum criteria of five years' experience for the teachers as the number of al-Quran teachers for the elderly is also limited.

The interviews are purported to acquire the items in the method of elderly's al-Quran teaching in more detail, hence the instrument development using the interview method. Five experts were interviewed personally while the other five experts were interviewed online through the voice note feature in WhatsApp. The latter occurred as, during the phase of the interview, Malaysia is in the early stage of the COVID-19 pandemic, seeing every citizen observe the Movement Control Order (MCO). The followings are the list of experts involved in constructing the instrument.

Table 3.4: Experts in Designing the Element, Construct, and Item of the Model

EXPERTS	
Panel 1	A lecturer in <i>tajweed</i> and <i>qiraat</i> , teaching al-Quran to adults and the elderly.
Panel 2	A lecturer in al-Quran and <i>qiraat</i> , teaching al-Quran to the elderly.

Panel 3	A lecturer in <i>usuluddin</i> and <i>da'wah</i> , developer of an education model for the elderly.
Panel 4	Islamic Affairs Officer and <i>fardh 'ain</i> teacher in Rumah Seri Kenangan.
Panel 5	A principal of al-Quran class for the retirees.
Panel 6	An al-Quran teacher for the elderly in public classes.
Panel 7	An al-Quran teacher for the elderly in public and private classes.
Panel 8	An al-Quran teacher for the elderly in private classes. This classes were established under an NGO.
Panel 9	An al-Quran teacher in <i>masjid</i> at an IPTA. This class adopts the al-Quran teaching model for adults.
Panel 10	An al-Quran teacher for the elderly in <i>masjid</i> , classes and homes in Perlis.

After the interview data was gathered through the thematic method, the elements, constructs and items for the questionnaire instrument were developed. Since there is no specific guideline in teaching al-Quran to the elderly, most of the experts only shared their experience in teaching them with various methods and approaches deemed suitable for the elderly. Essentially, the construction of the model's instruments was based on prior studies, theories on the model of Quranic teaching for the elderly as well as interviews with experts.

iii. Focus Group Discussion

After every item was constructed from the interviews, a focus group discussion was arranged to analyse and discuss the elements, constructs and items to be consolidated in the FDM questionnaires. Concisely, the FGD technique was established by S Emory Bogardus in 1926. This technique elaborates group interview in the social-psychological field (Wilkinson, 2016). FGD technique was employed to discuss and

analyse each item, whether it is relevant to be in the model of Quranic teaching for the elderly. FGD also functions to validate the developed themes (Norsakira jerrydin et al.,2019) The effectiveness of FGD rely on the moderator's competency in manoeuvring the session, besides the systematic arrangement of the interview protocol (Hidayah et al., 2018).

The MCO was still in order during the FGD of which the session took place online through the Skype application. Eight experts, a moderator and an observer attended the session, of which two of them are professionals in teaching al-Quran, three from the field that is teaching the elderly, while two experts are professionals in the field of gerontology. Each expert was invited to attend the session two weeks and one week before the FGD commenced. Each expert was provided with the study's proposal paper and items to be discussed. This measure is to ensure every expert have the chance to analyse and apprehend the matters to be discussed during the FGD. The following table exhibits the details on the involved experts for the session.

Table 3.5: Experts for the Instrument Construction in FGD

EXPERTS	
Panel 1	A Lecturer in the field of sciences and humanities (gerontology).
Panel 2	A Deputy Director of MyAgeing of Malaysia.
Panel 4	A lecturer in al-Quran and <i>qiraat</i> , teaching al-Quran for the elderly.
Panel 5	A principal of al-Quran class for the retirees.
Panel 6	Islamic Affairs Officer and <i>fardh 'ain</i> teacher in Rumah Seri Kenangan.

Panel 7	An elderly's al-Quran teacher in private class. This class was established under an NGO.
Panel 8	An elderly's al-Quran teacher in private classes.

Despite having close similarity to the interview protocol, the data gathered through FGD is more accurate as it has undergone discussion and argued consistently by every expert of their respective fields. In general, FGD will be conducted in two sessions, with observing breaks for the experts to ensure quality data can be harnessed. Each session is conducted in 3-4 hours. Upon discussion and analysing, from 226 items, only 109 items were accepted while 117 were dismissed. Among the factors of the dismissal are bearing a similar meaning with the other items and not being applied by all al-Quran teachers for the elderly. Besides, there were also items switched to other constructs. Despite having technical challenges in the internet access from certain experts, the discussion and consensus were achieved well.

3.3.2.1. Content Validity

One of the criteria to fulfil content validity is the validation from experts. Every element applied in this study is identified from previous studies. This, in consequence, fulfils the criteria of content validity. Experts' questionnaires were framed and underwent a translation process (back-to-back translation). When this process took place, each comment, suggestion and correction proposed by experts on the wordings, content items and confusing sentences were amended.

Besides that, content validity is a procedure that needs to be obliged by the researcher before conducting a study. Determination of content validity refers to the

capability of the research instrument to contain information that incorporates the components of the studied field (Cresswell, 2008; Chua, 2006; Pallant, 2001). Cresswell (2007) suggests researchers to refer the experts in certain fields of study to validate the elements or questions in the research instrument. According to Makki, Khalick and Bou Joude (2003), there are at least three experts in the related field needed for the experts' measure method. Therefore, the researcher gathered opinions from four experts in related fields to validate the elements and constructs to be applied in the study afterwards. Next, this evaluation instrument will undergo face and content validity by four appointed experts before the questionnaire is overseen by the selected groups of respondents.

Finished with the FGD and managed to found several items were dismissed, the research proceeded with the FDM questionnaires. Since the FGD session comprised of eight experts, content validity was indirectly conducted (Sri Astutik & Endang, 2017). The next process was face validity which involved four experts to observe the language and sentence structure to make it easier to understand. Overall, the involved experts provided positive and constructive comments for the suitable and required elements in this model. The followings are the involved experts for face validity:

Table 3.6: Experts for validation instrument

Experts	
Panel 1	A lecturer in the Faculty of Major Language Studies.
Panel 2	A Bahasa Melayu teacher in a secondary school.
Panel 3	A lecturer of Quran dan Sunnah studies.

Panel 4	A lecturer in <i>da'wah</i> and gerontology fields.
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After the instrument of Fuzzy Delphi questionnaires formed up, the questions were distributed to 15 experts that represent their own fields as illustrated in Table 3.3.

3.4.4 Data Analysis

There are several steps that need to be followed by the researcher in conducting analysis using the Fuzzy Delphi method. The procedure for analysis using FDM is as follows:

Step 1: Selecting experts. In this study, there are 15 experts appointed as explained in the previous chapter. They are requested to determine the priority for evaluation criteria of the variables, which will be measured by using linguistic variables. The process to acquire information and data depends on the efforts of the researcher. Among the applicable methods are organising academic workshops or seminars and inviting the associated experts and meeting the identified experts in person.

Online sharing such as emailing the identified experts known to have expertise in the required field by the researcher. However, in this phase, the researcher chose to meet the selected and identified experts in person to accommodate discussion and information process on the forecasted issues in the items and so on.

Step 2: Determining linguistic scale. This process involves the conversion of all linguistic variables into triangular Fuzzy numbers. This step also involve the conversion of linguistic variables by accumulating Fuzzy numbers (Hsieh et al., 2004). Linguistic scale resembles the Likert scale that is applied in other studies, but it is added with

Fuzzy numbers based on triangular Fuzzy numbers views (fuzziness expert opinion).

Three values are shown in the figure below:

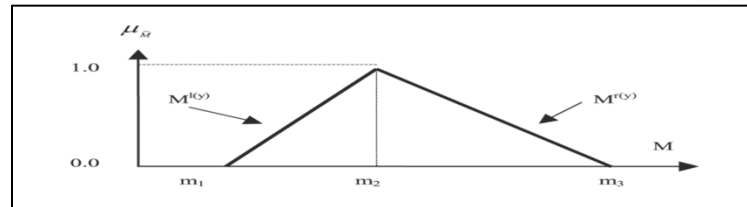


Figure 3.4: Triangular Fuzzy Number

M_1 = minimum value; M_2 = medium value; M_3 = maximum value. In other words, linguistic scale is applied to convert linguistic variable scale to Fuzzy numbers. The scale of the agreement must be (three, five and seven on the linguistic scale). The higher the scale, the more accurate response analysis acquired (Muhammad Ridhuan, 2013).

Table 3.7: Fuzzy Numbers

7 Point Fuzzy Scale	m1	m2	m3
Strongly agree	0.09	1.00	1.00
Very agree	0.70	0.90	1.00
Agree	0.50	0.70	0.90
Undecided	0.30	0.50	0.70
Disagree	0.10	0.30	0.50
Very disagree	0.00	0.10	0.30
Strongly disagree	0.00	0.00	0.10

Step 3: Following the response from chosen experts, the researcher is required to convert all Likert scales into Fuzzy scales. This process is also known as identifying

mean responses of each Fuzzy number (Benitez et al., 2007). This process was done based on the formula;

$$M = \sum_{i=1}^n m_i$$

Step 4: Process of identifying threshold value “d”. The threshold value is critical in identifying the level of consent among experts (Thomaidis, Nikitakos & Dounias, 2006). The gap between each Fuzzy number $m=(m_1, m_2, m_3)$ and $n=(n_1, n_2, n_3)$ is calculated with the equation:

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

A threshold value is critical in identifying the level of consent among experts. According to Cheng and Lin (2002), if the threshold value is less or equal to 0.2, thus it is considered as reaching experts’ consensus. Meanwhile, group consensus must be above 75% for each item, or else a second round must be executed.

Step 5: Identifying alpha level for Fuzzy evaluation’s aggregate once experts consensus are gained by adding Fuzzy numbers for each item (Ridhuan, 2013). Calculating and determining Fuzzy value is by using this equation: $A_{max} = 1/4 (m_1 + m_2 + m_3)$.

$$\tilde{A} = \begin{bmatrix} \tilde{A}_1 \\ \tilde{A}_2 \\ \vdots \\ \tilde{A}_m \end{bmatrix} \text{ where } \tilde{A} = r_{i1} \times w_1 + r_{i2} \times w_2 + \dots \dots \dots r_{in} \times w_n$$

$$i = 1, 2, \dots, m$$

Step 6: The next step is the defuzzification process. This process runs the equation as such $A_{max} = 1/4 (m_1 + m_2 + m_3)$. In case the researcher uses average Fuzzy Numbers or average response, the scoring number generated is the number that falls between the range of 0 to 1 (Ridhuan et al., 2014).

Step 7: Ranking process or sub-phase for the model. The ranking process was done by selecting elements of the model corresponding to their defuzzification value, which is based on experts' consensus whereby the highest element is determined as the most important in the model (Fortemps & Roubens, 1996).

Terms of Acceptance and Rejection of Items

Based on the Fuzzy questionnaires at the attachment, the scale adopted was seven. It was chosen as Chang, Hsu and Chang (2011) affirm that seven scales are more accurate compared to five and able to reduce the gap of ambiguity. To demonstrate the level of consensus by the experts on each item, three conditions need to be met.

First condition: Experts' consensus underlines whether an item is accepted or rejected. Chu and Hwang (2011), as well as Murray and Hammons (1995), assert that the percentage of experts agreement mu be over 75%. If the acquired percentage is less than 75, the item is automatically rejected.

Second condition: Based on the reading of threshold value, d (Cheng and Lin, 2002; Chang, Hsu and Chang, 2011) remark that if the threshold value, d , is less than 0.2, the item is accepted, while a value of more than 0.2 is rejected.

Third condition: Based on the a -cut, the particular item can be decided to be accepted or rejected. According to Tang and Wu (2010), Bodjanova (2006), the value for an item to be accepted is above 0.5.

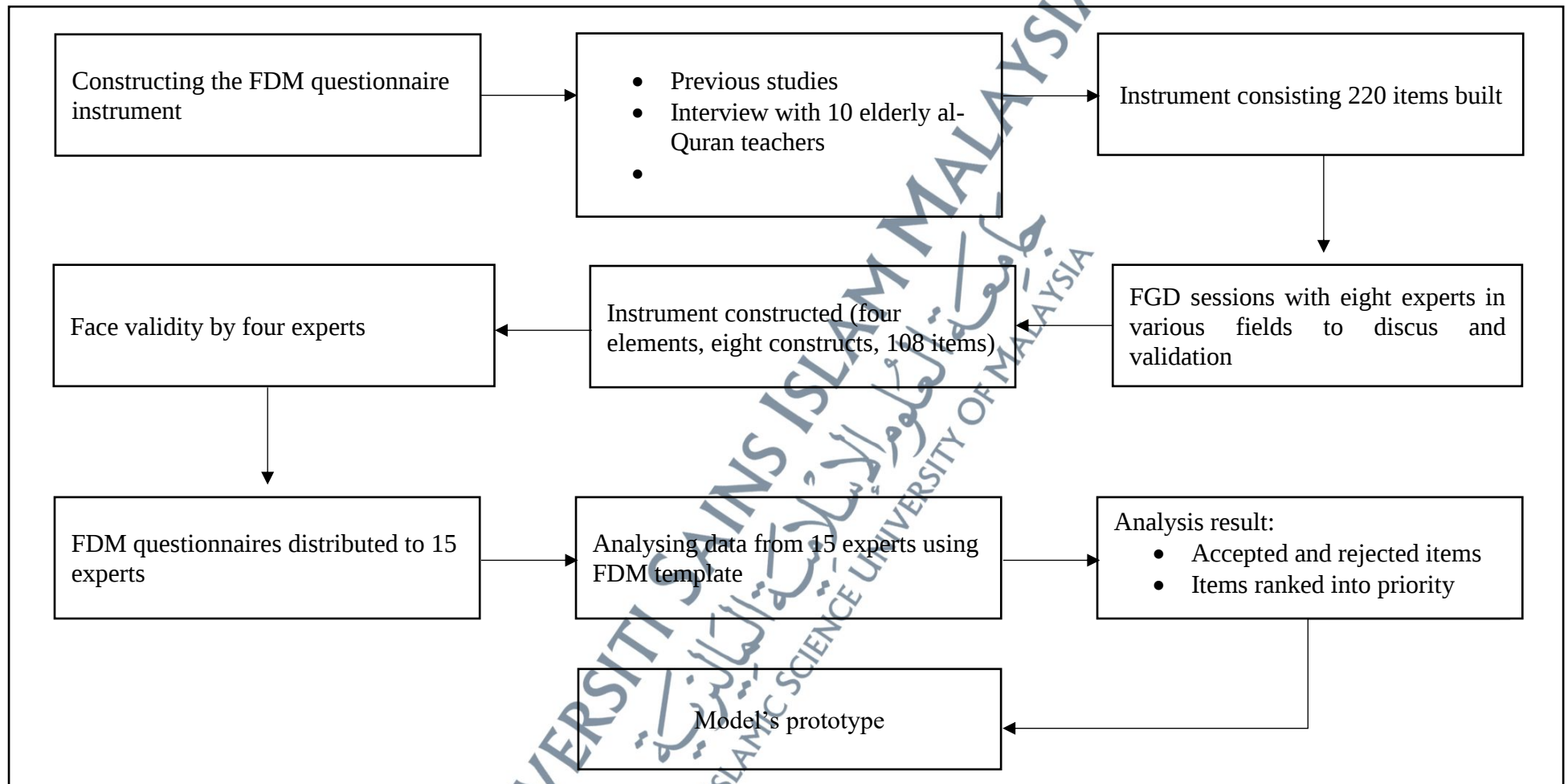


Figure 3.5: Summary for the Flowchart of the Data Gathering Process for the Second Phase (Design and Development)

3.5 Third Phase: Model Evaluation

Phase purpose. To evaluate and validate the developed model. The assessment was conducted by experts by evaluating whether the model's items suitable for the target. This phase aims to answer this research question:

What are the experts' evaluations on the model of Quranic teaching for the elderly?

In thought of that, for this phase, the researcher will use NGT to gain consensus from experts pertaining to the evaluate prototype model. NGT template will be used in analysing data to gain consensus and agreements from experts on the developed model.

3.5.1 Data Collection Technique

For the data collection technique in this phase, NGT method was adopted. It is a technique to gather research data based on a group's structured meeting to gather agreements from the members of the group (Varga Atkins & McIsaac, 2011). According to Aizzat Mohd Nasurdin et al. (2006), NGT is a method that involves the decision-making process in the form of face-to-face small-group discussion. In addition, the advantage and strength of NGT in the data collection process is its semi-qualitative and structured features (Dobbie et al., 2004; O'Neil & Jackson, 1983; Perry & Linsley, 2006). Furthermore, the strength of NGT serves as a constructive problem resolution and structured approach in achieving the consensuses of a broad issue to generate a set of suggestions or prioritised solutions (Aizzat Mohd Nasurdin et al., 2006; Dobbie et al., (2004). Additionally, this technique provides the opportunity to generate the members' unique ideas in assessing the provided items (Dobbie et al., 2004). An item

is accepted when it attained a percentage value of over 70% (Saidah Siraj et al.,2020). Hence, the researcher adopted NGT as the assessment tool for the final phase because the assessment is not only interpretable in the form of data, but also in the data transcription of the expert panellist' commentaries. The employment of NGT as the assessment technique of the third phase in model development was also seen in the studies by Ridhuan Jamil (2016), Habibah (2017), Hafiz Saleh (2018), and Amani (2019).

3.5.1.1 NGT Procedure

Experts consensus established five steps to be followed in running this technique (Harvey & Holmes, 2012; Wiliam et al., 2006). The first step is giving explanation on the conducted research. Second step is idea generation by the participants of the research. Third step is the sharing of ideas among the participants of the research. Fourth step is the discussion on the items, themes and elements for the issue in research. The final step is the rating process by the participants of the research

However, during the assessment of this model, Malaysia is still observing its MCO due to the COVID-19 pandemic, forcing every assessment process to be conducted online. All experts gathered online through the Skype application to discuss, give opinions and assess the prototype of this model. The table below explains the procedure in conducting NGT online.

Table 3.8: Summary of the Procedure in Conducting NGT

NO.	STEPS	EXPLANATIONS
1	Presentation of the model's prototype by the researcher	The researcher briefly presents the challenges, objectives and method of research. The researcher extensively presents the elements, constructs and items in the model.
2	Idea generation by the participants.	Each expert was allocated time to take notes, remark and comment on the presented model.
3	Idea sharing among the participants.	Moderator provided the chance to each expert panellist to express their opinions, ideas and comments on the presented model.
4	Discussion on the items, themes and elements of the issue in research.	Discussions were conducted on items that needed to be improvised, retained or dismissed. At this stage, sentence structuring can be discussed.
5	Rating process by the experts	Due to the online platform and the rating process conducted in privacy, the Google Form's link for the rating was provided after all procedures were conducted. Each expert was required to conduct the rating promptly. The rating was on a scale of 1-5 to state the appropriateness of the item.

According to O'Neil and Jackson (1983), the period of face-to-face workshop sessions is between two to half an hour. However, the period might depend on the particular study. Since this study was conducted online, the period for discussion and assessment was conducted for three and a half hours.

3.5.2 Research Samples

Experts are the informants or research subjects who are directly involved in providing inputs and data in addressing the issue of research. In determining the number of experts involved in the NGT method, scholars have outlined several opinions as the followings:

Van de Ven and Delbecq (1971) remark the number of experts in the research adopting NGT as its data collection method is from five to nine people. In contrast, Allen, Dyas, and Jones (2004) argue that the number of experts must be between nine to 12 people. As for Harvey and Holmes (2012), they assert the most ideal and the best number of research participants is from six to 12 people. On account of those views, this research decided to employ five experts comprising of al-Quran teachers for the elderly and one elderly to make up the following information;

Table 3.9: Experts through NGT Method

Experts	
Panel 1	A Lecturer in al-Quran and <i>qiraat</i> and teach al-Quran for the elderly.
Panel 2	A Lecturer in IPG and teach al-Quran for the elderly.
Panel 3	A Principal of Yayasan al-Quran Kuala Lumpur.
Panel 4	A principal of al-Quran class for the retirees.
Panel 5	Al-Quran teacher in Rumah Kebajikan Warga Emas.
Panel 6	A lecturer in IPG and elderly student that learn al-Quran.

3.5.3 Research Instrument

The research employed online instrument with Skype application. All experts were given the meeting link a day before the NGT session. The research was presented through screen sharing from the application and the assessment form through Google Form was distributed to all experts by sharing the link.

3.5.4 Data Analysis

There are multiple methods to interpret data in NGT. The accepted range in NGT measurement is the score percentage exceeding 70%. The range must align and matches

with the views by the group of scholars that the percentage of acceptance of an element must be based on the score's percentage value in which its usability of an element as measured by the participants must be at least 70%.

Table 3.10 illustrates a sample of findings analysis that adopted NGT, comprising the evaluated items, group score, total of score, percentage and evaluation status for three groups that have undergone face-to-face and simultaneous NGT process.

Table 3.10: An Example of Findings Analysis using NGT Template

Item	Scores of research participants' group			Total of score	Percentage (%)	Ranking	Evaluation status
	A (n=7)	B (n=7)	C (n=7)				
1	39	37	45	121	82.3	3	Suitable
2	41	39	46	126	85.7	1	Suitable
3	42	40	41	123	83.7	2	Suitable

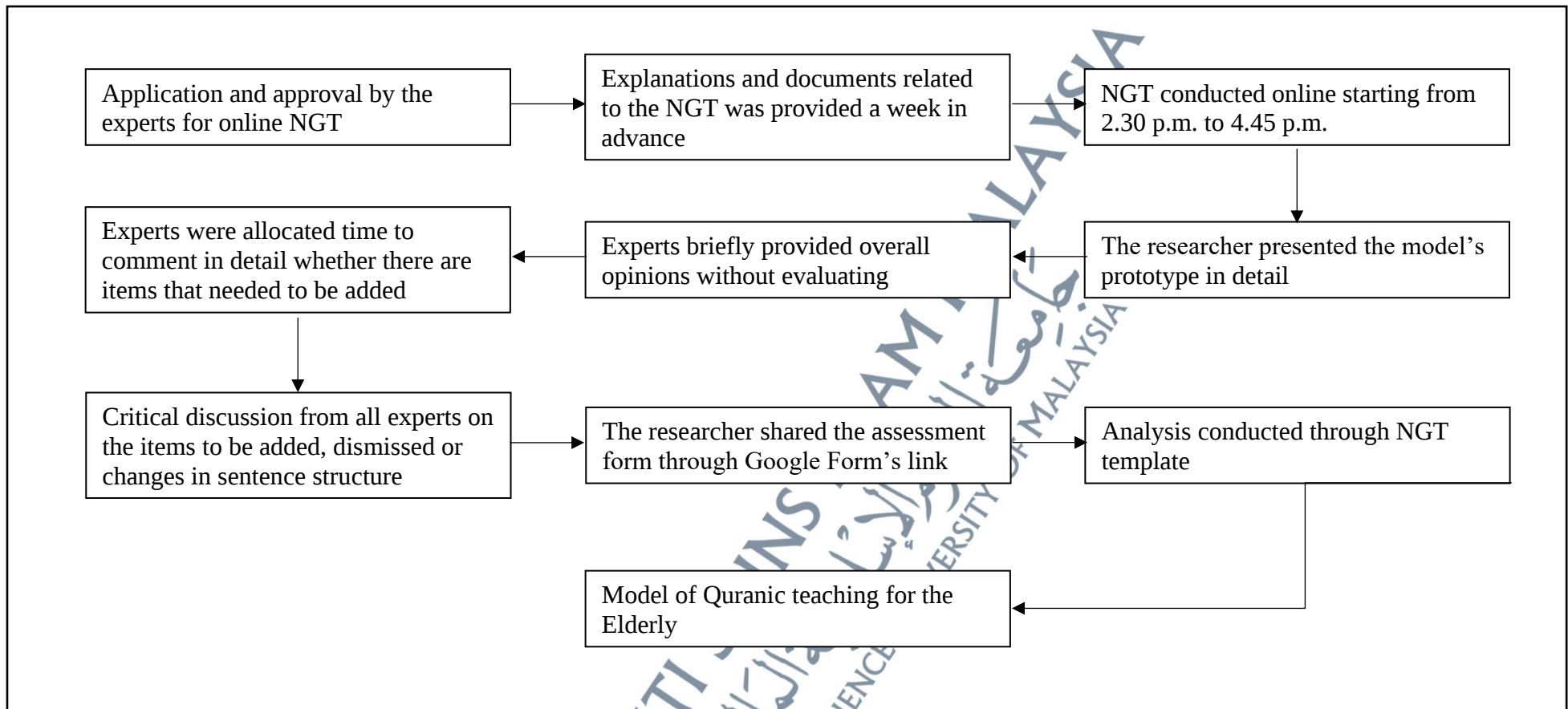


Figure 3.6: Third Phase's Evaluation process by NGT's Consensus Method

Table 3.11: Summary of Research Matrix

Needs Analysis Phase			
Research questions	Method	Respondents	Data analysis
Is there any need to develop the model of Quranic teaching for the elderly?			
i. What are the challenges faced by the elderly in learning al-Quran? ii. Is there a need to develop the model of Quranic teaching for the elderly?	Interview	9 experts	Systematic data analysis
Design and Development Phase			
How to develop the model of Quranic teaching for the elderly based on the following aspects?			
i. What are the required model elements in designing the model of Quranic teaching for the elderly? ii. Is there any consensus by experts on the aspects that should be included in the model of Quranic teaching for the elderly?	• Interview • FGD • Fuzzy Delphi method	• 10 experts of al-Quran teacher for the elderly • 8 experts • 15 experts	Fuzzy Delphi's template
Evaluation Phase			
What are the experts' evaluation on model of Quranic teaching for the elderly?			
	NGT	6 experts	NGT's template

3.6 Conclusion

This study employed the design and development (DDR) approach as introduced by Richey and Klein (2007). It incorporates three phases; the needs analysis phase, the design and development phase, and the evaluation phase. Each phase contains its respective objectives and research questions that are required to be resolved with a suitable research method. In the first phase, which is the needs analysis phase, the data collection technique was by interview involving nine experts to gather the data on the challenges face by the elderly in learning al-Quran, as well as the need to develop the model. The data was analysed using thematic analysis. The second phase, the design and development phase, employed FDM to gain experts consensus and the ranking for the elements, constructs and items of the model.

However, before the FDM questionnaires were distributed, the instrument was created from the interview with 10 al-Quran teachers and discussed in an FGD session attended by eight experts. Consequently, the instrument underwent face validity by four experts and was distributed to 15 experts for the FDM purpose. The findings from the FDM questionnaires were analysed using the FDM's format and template to create the model's prototype. After the prototype was created, the research went through the final phase, the model assessment phase. In this phase, the researcher adopted the NGT method to attain assessment in the form of scales and transcriptions. The data were analysed using NGT's template and after attaining the experts' assessment conditions, it lead to the creation of the model of Quranic teaching for the elderly.