Digital Competence Among Islamic Teachers: A Pilot Study on Validity and Reliability

Nor Alniza Azman
Faculty of Education, National University of Malaysia, 43600 Bangi, Malaysia
p113278@siswa.ukm.edu.my

Mohd Isa Hamzah
Faculty of Education, National University of Malaysia, 43600 Bangi, Malaysia
isa_hamzah@ukm.edu.my

Khadijah Abdul Razak
Faculty of Education, National University of Malaysia, 43600 Bangi, Malaysia
khadijah.razak@ukm.edu.my

Hafizhah Zulkifli
Faculty of Education, National University of Malaysia, 43600 Bangi, Malaysia
hafizhah_zulkifli@ukm.edu.my

ABSTRACT
It is a necessity for a researcher to ensure that the validity and reliability of the study is met to prove a discovery. However, there are still qualitative researchers who are still reckless and do not emphasize the concept of validity and reliability when designing, collecting, and analysing the research findings. The quality of a qualitative study depends on the honesty, compliance, and thoroughness of the researcher in carrying out the study in a systematic and structured manner. Therefore, this study aims to analyse the qualitative validity and reliability strategy according to scholars' views as well as describing the validity and reliability strategy carried out in the pilot study. Through document analysis, the concept of validity and qualitative reliability can be explained through four concepts namely credibility, dependability, reliability, and confirmability. Among the strategies that can be used in pilot study to increase its validity and reliability is by peer review that takes place during the construction, review, and verification of the interview protocol. Reflective journal writing can also help increasing the reliability of the pilot study. It is hoped that this article can expand the reader's knowledge related to validity and reliability, especially in conducting pilot studies and at the same time, help qualitative researchers in carrying out their procedures properly to guarantee the quality of the research.
Keywords: Validity, Reliability, Trustworthiness, Pilot study, Qualitative

Introduction
The naturalistic approach implemented in qualitative research can provide a deep natural understanding of the phenomenon being studied. Researchers explain the phenomenon based on their own perspective because one's understanding could be different depending on their own point of views. But in qualitative research, there are clear guidelines for the researchers to prove their findings and make them more reliable.

However, in reality, there are still qualitative researchers who did not carry out the data collection procedures properly and convincingly to justify the findings of their study. Nordin et.al (2018) found that qualitative researchers faced problems in their data collection, whereby they fail to collect variety of data types as well as incomplete data. This scenario shows that researchers have not yet fully understood the need for data collection from various sources to help improve the validity and reliability of research findings through triangulation strategies. The effect of misinterpreting this concept can cause biases during the process of analysing the data. This is in line with Noble & Smith's (2015) study which explains that most qualitative researchers are often criticized because they are not transparent in carrying out the process of analysing data, which consequently causing their findings to be biased and influenced by their personal opinions.

Based on the writing patterns related to the validity and reliability of qualitative studies, most scholarly discussions are focussed on the concept of qualitative validity and reliability in the real field (Kamarul Jasmi & Hilmi 2022; A. Stahl & R. King 2020; Nordin et.al 2018; Zettiey & Karmila 2016; Noble & Smith 2015; Basheer et al 2008). Yet, there are no such guidelines being discussed which focus on the concept of qualitative validity and reliability, especially at the beginning stage, the phase of designing the study including the construction of instruments (interview protocol) as well as the importance of conducting the pilot study. As a matter of fact, the beginning stage of the study is paramount to ensure that the findings could really explain the actual scenario that occurs and guarantee the credibility as well as the reliability of the qualitative study (Ghazali & Suffean 2016).

Based on the problem explained, this article aims to analyse validity and reliability strategies in qualitative studies based on the views given by leading scholars as well as to describe the strategies that can be used in the pilot study on the same respect. Therefore, this study is very important to provide guidance for researchers to plan and carry out the proper procedures in the collection and analysis of qualitative data. The discussion of this article could shed some lights on the difference between the concept of validity and reliability of quantitative research which is more statistical in nature compared to the concept of trustworthiness and compliance of qualitative research which is more dynamic and flexible. Even so, the findings on both of these types of studies must be proven with a strategy that have been determined according to their respective methodological paradigms.

Validity & Reliability in qualitative research
Validity in qualitative research refers to the accuracy or credibility of the research findings (Maxwell 1996) where the data can be accurately explained through the description of the characteristics of the phenomenon (Hammersley 1987) that really happened to represent the study participants (Cresswell & Miller 2000). The process of validity depends on the ability of the researcher to prove the phenomenon that had occurred (Rasid & Raman 2015) with the support of evidence (Othman Lebar 2009) to describe the reality in the field, even if only by reading the research report provided (Chua Yan Piaw 2006).

According to qualitative scholars, the concept of validity needs to be defined in accordance with the paradigm of interpretivism to emphasize the quality of the study in order to be carried out correctly (Stenbecka 2001). However, the validity of qualitative research has been detailed by Davies & Doss 2002, by exploring the subjectivity, reflexivity and social interaction of the interview to distinguish it from other studies that used a positivist approach. The views of these two scholars are in favour of Lincon & Guba (1985), who proposed a new idea of measurement which is by ensuring that the data can be defended and therefore build up the confidence in others about the findings of the study. Although originally, qualitative study does not require validity, but there is an awareness among qualitative researchers to create a similar concept as a review tool or qualification measure to validate their study (Morse et.al 2002).

For Hammersley & Atkinson (1983) validity does not focus on the data but rather refers to the inference generated from it. This is because researchers need to ensure the validity of their research findings as well as prove that the assumptions of the chosen research paradigm have been implemented properly and accurately. This is supported by Patton (2001) who explained that researcher needs to ensure that validity should start from the phase of designing, collecting and analysing the data, and evaluating the quality of the study. Therefore, the researcher should really emphasize validity of the study to ensure that the real phenomenon can be translated through the findings.

Qualitative research, on the other hand can be depicted through several scholars' views who focus on research findings that can be replicated in the same or different time (Merriam 1998). It also means that qualitative research findings can be compared and any differences therein can be explained (Rasid & Raman 2015). Reliability can also be recognised with the concept of consistency of the data collected. According to Othman Lebar (2009), data consistency does not mean that the same results can be achieved again, but the findings of the study however can be proven through the validity process in a qualitative study (Seale 1999). Hammersley (1992) added that data consistency should be agreed upon by several researchers, in the same or different group, regardless of the same or different situations.

The purpose of reliability in qualitative research is to generate an understanding (Stenbecka 2001). In order to achieve that goal, the reliability of the study can be strengthened by the formation of consistent constructs through methodology and study operations that are constantly updated (Rasid & Raman 2015). This shows that the reliability of this qualitative approach depends on the ability and skill of the researcher to conduct the study according to the current situation (Patton 2001; Lincon & Guba 1985). This is because studies involving human behaviour are not static and rather difficult to be determined even in the same situation should the researcher decided to conduct a repetition of that particular study (Noble & Smith 2015). But Patton (2001) insists that the reliability of the study can be achieved with sufficient validity in a qualitative study.

Based on the discussion of validity and reliability in qualitative research, the researcher can conclude that these two concepts are interrelated and dependent upon one another. Nonetheless, the roles of qualitative in terms of validity and reliability showed distinctive criteria with the quantitative context. In this study, the researcher defines validity and reliability in accordance to the suggestions conferred by Lincon & Guba (1985) who use the term honesty (trustworthiness) as an accurate phrase to describe validity and reliability in a qualitative approach. There are four criteria proposed to measure trustworthiness, namely; credibility, transferability, dependability and

confirmability. Table 1 below shows a summary of the equivalence of the concept of validity and reliability in quantitative and the concept of trustworthiness in qualitative.

Table 1: A summary of the equivalence of quantitative and qualitative research evaluation concepts. Excerpt from Noraini Idris 2013.

Quantitative Validity and Reliability Criteria	Qualitative Trustworthiness Criteria
Internal Validity	Credibility
External Validity	Transferability/Applicability
Reliability	Dependability/Consistency
Objectivity	Confirmability/ Neutrality

Based on the table above, the emphasis on trustworthiness criteria focuses on ensuring that qualitative research findings can be implemented with systematic validity and reliability procedures to generate undisputable findings in the evaluation of the study. Next, the researcher will discuss the strategy of validity and reliability in qualitative research.

Methodology
In gathering information and materials, this study uses a literary approach through literature sourced from journal articles and books related to qualitative methodology. There are several main sources of methodology reference books that are selected as primary data such as Qualitative Research: A Guide to Design and Implementation written by Sharan Merriam 2009 in the third and fourth editions co-written with Elizabeth J. Tisdell 2016, An Expanded Sourcebook: Qualitative Data Analysis second edition written by Matthew B. Miles & A. Michael Hubberman 1994, Qualitative Inquiry & Research Design second edition written by John W. Creswell 2007, Qualitative Research in Education: An Introduction to Theory and Methods written by Bogdan, R. & Biklen, S.K. 2003, *Penyelidikan Kualitatif: Pengenalan kepada Teori dan Metode* written by Othman Lebar 2017 and *Metodologi Penyelidikan dalam Pendidikan: Amalan dan Analisis Kajian* written by Ghazali Darussalam & Sufean Hussin 2016.

These methodology books are chosen because they are written by scholars who are often quoted as the references among qualitative researchers. Moreover, a Malay edition book is also listed to help the researcher form better understanding of the concepts discussed. This is also due to the fact that the researcher had limited access to some original books written by other scholars in qualitative method such as Lincon & Guba, Patton, and so on. Apart from that, various journal articles especially those that discuss qualitative methodology have become the researcher's supporting reference. The process of collecting the material begins with the search and collection of information through printed and electronic materials, which are then analysed through content analysis.

Content analysis techniques are used to generate findings to answer the objective of the research, which is to analyse the validity and reliability of qualitative studies according to scholars' views and to explain the process in the pilot study. This technique is used in line with the views of Bell and Bryman (2007) and Bryman (2008) who postulated that one of the advantages of the document content analysis technique is that it allows the researcher to analyse the value and detect 'what' can be obtained in a document and allows the analysis of value or patterns and changes that occur in a long period of time.

However, the literature is limited only to the information sourced in relation to the scope of the study since it is heavily dependent on the materials available in the library.

Findings
1. **Qualitative validity and reliability strategy analysis**
There are various strategies proposed by qualitative scholars to ensure trustworthiness in qualitative studies. In this article, the researcher had formulated a validity and reliability strategy based on the views of several leading scholars in qualitative research. But this discussion is based on the concept of trustworthiness proposed by Lincon & Guba 1985 and added by Merriam 2009 which is from the aspects of credibility, transferability, dependability and confirmability.

Internal Validity/Credibility
Internal validity relates to how the findings of the study correspond to reality (Merriam 2009). The intended reality is the truth or what actually exists and happens. However, the reality itself is subject to abstract, subjective and constantly changing according to time and circumstances. Therefore, the credibility of a qualitative researcher needs to be emphasized to ensure that the findings of the study can be justified and there is no doubt about it. This effort is highly dependent on the researcher's ability in carrying out the research process, understanding and

reporting real phenomena in the field (Rasid & Raman 2015). There are several strategies in qualitative internal validity as shown in table 2 below.

Table 2: Internal Validity Strategy

Internal Validity/ Credibility	•Triangulation/Multi method Strategies	*Merriam & Tisdell 2016; Creswell 2014; Guest et.al 2014; Merriam 2009; Mc Millan & Schumacher 2006; Bogdan & Biklen 2003; Yin 1994; Matthew B. Miles & A. Michael Huberman 1994; Patton 2001; Lincon & Guba 1985*
	•Peer checking/ Participant review /Elicit feedback from participants after summarizing their interview	*Merriam & Tisdell 2016; Creswell 2014; Guest et.al 2014; Merriam 2009; Johnny Saldana 2009; Mc Millan & Schumacher 2006; Lincon & Guba 1985*
	•Adequate engagement in data collection/ Prolonged & persistent field work/ Prolonged engagement	*Merriam & Tisdell 2016; Creswell 2014; Merriam 2009; Mc Millan & Schumacher 2006; Bogdan & Biklen 2003; Lincon & Guba*
	•Negative case analysis	*Guest et.al 2014; Creswell 2014; Meriam 2009; Mc Millan & Schumacher 2006; Lincon & Guba 1985;*
	•Reflexivity-researcher position/Researchers bias	*Merriam & Tisdell 2016; Creswell 2014; Merriam 2009;*
	•Peer review/examination/ Peer debriefing	*Merriam & Tisdell 2016; Creswell 2014; Guest et.al 2014; Merriam 2009; Johnny Saldana 2009; Bogdan & Biklen 2003; Lincon & Guba 1985*

Based on the table above, there are six strategies that can be considered by qualitative researchers in ensuring high validity. The triangulation method is a strategy that is widely suggested by most qualitative scholars. It is a validity procedure where researchers use more than one method in a study such as data sources, data collection methods, analysis methods and the use of various mediums to form categories and themes in a study (Merriam 2009; Rasid & Raman 2015; Othman Lebar 2006). Therefore, the findings obtained from one method will be strengthened by another. This will increase the validity of qualitative research findings (Zanaton et.al 2016).

Denzin (1978) explained that there are four types of triangulations, namely; the use of various methods, various data sources, various researchers and various theories to confirm the findings of the study. Merriam (2009) detailed triangulation as covering a process where the researcher can use various methods in data collection such as validating interviews by making observations and research documents to see their relevance towards the phenomenon being studied. Next, various data sources can be implemented by comparing the findings through cross checking observations made at different times or different places, through interviews with people from different perspectives and even through extended interviews. In addition, researchers can use various theories in one study to understand the aspects involved holistically. And lastly, Patton (2001) explained that two or more researchers conducting the study can analyse and compare their findings which will increase the validity of the study.

Peer review or the validity from the research participants is one of the internal validity strategies proposed by re-referencing the data and findings as interpreted by the researcher (Merriam 2009). This process involves three phases; the participants validate the interview transcript; validating the understanding and interpretation made by the researcher; verifying the initial analysis (Zanaton et.al 2016) to avoid misunderstanding or misinterpretation from the researcher's perspective related to the phenomenon that is happening (Maxwell 2013). This process can help increasing the credibility of the researcher in generating real findings. Thus, the researcher has a role to improve the data in line with the comments given by the study participants. Indirectly, researcher's biases can be reduced in the study.

Next, the length of time spent at the field can increase the credibility of qualitative research findings (Merriam & Tisdell 2016; Creswell 2014; Merriam 2009; Mc Millan & Schumacher 2006; Bogdan & Biklen 2003; Lincon &

Guba). This method allows the researcher to establish good relationship by building trust with the study participants to obtain deep and rich information on the phenomenon being studied (Norman & James 2020). The data obtained over a long period of time allows the researcher to analyse and compare them by making repeated observations and interviewing the study participants until data saturation is reached while in the field (Merriam 2009). Clearly, the length of time spent and the relationship with the research participants can guarantee the credibility of the research findings.

During data collection, the researcher needs to find parallel or contrary variations in understanding the phenomena that occur in the researcher's initial expectations. Should the researcher find opposite findings, the researcher must source for literature support to understand the phenomenon that occurs. This is in line with the recommendations by Patton (2015) who thinks that researchers need to find alternative evidence as support to explain the findings that are contrary to the original expectations. This can help in explaining the phenomenon from various angles to provide a clearer understanding to increase the confidence of the reader to understand the real phenomenon. Based on the explanation of the conflicting data earlier, it can help to strengthen the conclusion made whereby the researcher takes note and provides a comprehensive alternative explanation in discussing the findings. This negative and different case strategy can increase the credibility of the research findings (Merriam 2009).

The integrity of qualitative research can be improved by considering the researcher's position as an instrument with the process of reflexivity, where the researcher needs to be transparent in reflecting the study. Among the steps in the process are the researcher needs to explain the biases, assumptions, beliefs and values held at the beginning of the study. This is in line with the recommendations by Maxwell (2013) who said that one of the reasons why researchers need to explain their perspective and bias in conducting a study is that it is important to give the reader the context of understanding their values and expectations as these could affect the behaviour and conclusion of the study.

Next, the peer review/examination process refers to a data review process for evaluation purposes by colleagues and the public involved with the phenomenon being studied (Merriam 2009; Othman 2006). According to Zanaton et.al (2016) there are three ways in peer review which are discussions with supervisors (individuals who followed the study from the beginning), informal discussions with peers and formal discussions with individuals involved in or outside the study. In this process, these individuals are required to review and evaluate the theme whether it is reasonable or vice versa. Through question-and-answer sessions and getting feedback, it will make the research findings even more robust and focused in answering the research questions.

External Validity/Transferability/Applicability
External validity is a process that allows readers to evaluate the findings of a study to be transferred or used in a different context (Merriam 2009; Lincon & Guba 1985). However, the transferability or generalization of qualitative studies is quite difficult to achieve because this approach of interpretivism aims to understand the phenomenon that occurs in a focused manner. However, the findings of a qualitative study can be generalized with the discovery of new inquiries through the exploration of a phenomenon from various angles in depth. It is intended so that the results of the study can be applied from one different context to another. In other words, the new findings of this qualitative study can be used for other studies. Table 3 shows two strategies in external validity or transferability in qualitative studies.

Table 3: External Validity/Transferability Strategy

External Validity/ Transferability/ Applicabality	• Provide Rich and Thick Description	*Merriam & Tisdell 2016; Creswell 2014; Lincon & Guba 1985*
	• Maximum Variation/ Use the appropriate sampling.	*Merriam & Tisdell 2016; Merriam 2009; Lincon & Guba 1985*

Based on the table above, external validity can be achieved by providing a complete and detailed description in explaining the entire research process (Merriam 2009; Lincon & Guna 1985). The researcher needs to provide sufficient description to allow the reader to delve into the situation described in the study. Among the descriptions that need to be detailed in this process are information on the context of the study, data collection methods including the time frame and the field framework (Cátia Quintão et.al 2020). This clear and rich narrative description is transferable and can be used by other researchers in conducting their research. In summary, the preparation of this rich and detailed description can be a guide to other researchers for its applicability in new research contexts.

Another strategy that can increase transferability is by properly considering the selection of study samples. It can be achieved by diversifying sample variations in the study by involving several different sample backgrounds,

cases and situations to see various dimensional angles in understanding a phenomenon (Patton 2015). The purpose of maximizing sample variation is to enable the results of the study to be used by other researchers for a wider situation (Lincon & Guba 1985). This variation can be achieved through purposeful and random sample selection in qualitative studies (Othman 2006). However, Merriam (2009) added that the selection of a case can also improves transferability. It depends on the uniqueness of the case to be studied to see the specific contribution that can be learned in understanding a phenomenon.

Reliability/Consistency/Dependability
Reliability in qualitative refers to the extent to which a study can be repeated with the same results. In qualitative research, this concept of reliability is also known as dependability. According to Othman (2016), this reliability is closely related to how the researchers themselves, as the study instrument in qualitative research can ensure that something observed at different times has the same meaning to the individuals involved. This is because human behaviour is always changing. Accordingly, Lincon & Guba (1985) suggested that qualitative researchers to prove the results of the study with the support of detailed data display to show the consistency of the study. Table 4 shows some strategies that can be used to improve the reliability of qualitative studies.

Table 4: Qualitative Research Reliability Strategy

Reliability/Consistency/ Dependability	Merriam 2009	• Investigator's position • Triangulation • Audit Trail
	Lincon & Guba 1985	• Audit Trail • Peer Review/Examination
	Denzin & Lincon 1994	• Stability of Observation • Parallel Form • Inter-rater
	John ny Saldana 2009	• Peer Review • Initially Code-Transcribe Data • Reflective Journal
	Matthew B. Miles & A. Michael Huberman 1994	• Check Coding – Cohen's Kappa
	Bogdan & Biklen 2003	• Cohen's Kappa

Based on the table above, qualitative scholars have proposed reliability strategies in qualitative approach. As explained in the previous discussion, the researcher will discuss the audit trail strategy and peer review of the coding (inter-rater) which is measured according to the agreement of the Cohen's Kappa coefficient. Most of the suggested strategies aim to provide clarity about the research process starting from the design, the data collection, the data analysis and the reporting phases. All these phases should be justified by clear documents related to the research activities and all the results obtained during the study (Lincon & Guba 1985). This process should be prepared systematically and in detail by documenting them through writing journals and memos, keeping logs of research activities, forming a chronology of data collection and clearly recording data analysis procedures (Merriam 2009). Through this audit trail record, the results of the study will gain high reliability from the readers.

Apart from systematic documentation related to the research, expert evaluation can also increase the reliability of qualitative research findings (Denzin & Lincon 1994). This process requires the researcher to appoint several expert panels in their respective fields to review and evaluate the agreement on the themes formed in the study. Appointed experts will match the list of themes with the definitions of study terms to assess their reliability. This expert agreement process will be measured with the Cohen's Kappa index, which is the value of determining the degree of agreement of the coding done by field experts on the themes formed by the researcher (Zamri & Noriah 2003). A high expert agreement coefficient value indicates that the study has high reliability. According to Fleiss (1981), the Cohen's Kappa coefficient value determination table is as follows:

Kappa Value	Interpretation
≤ 0	No Agreement
0.01-0.20	Slight Agreement
0.21-0.40	Fair Agreement
0.41-0.60	Moderate Agreement
0.61-0.80	Substantial Agreement

0.81-1.00	Near Perfect Agreement / Perfect Agreement

Source: Fleiss 1981

Objectivity/Confirmability/Neutrality

Objectivity and confirmability can be achieved after credibility, transferability and consistency are met. Objectivity involves the researchers' acknowledgment of their own subjectivity against their bias related to the experience and interpretation in conducting qualitative research. Therefore, in increasing the reliability of the study, researchers should acknowledge and control their biases by explaining the assumptions and values held at the beginning of the study. Researchers need to make self-reflection through journal writing and systematic documentation of data collection and analysis activities as well as allowing review of the documents provided to ensure transparency in conducting the research process. Through this process, researchers can improve the quality of their research with the validity of the undisputed research findings. Transparency and accountability in qualitative research reflect the uniqueness and difference compared to the validity and reliability of quantitative research. The following is a table of strategies used in the objectivity and validity of qualitative research.

Qualitative Validity Strategy Table

Objectivity/Confirmability/Neutrality	• Reflexive Journal	*Lincon & Guba 1985*
	• Audit Trail	

2. Validity and reliability in pilot study

The process of validity and reliability of qualitative study needs to start at the designing phase so that it is parallel with the construction of the objectives that need to be achieved. The researcher needs to refer to the theories used in forming the objectives at the beginning of the study as the first step towards the exploration of a phenomenon. With this, the credibility of the study can be increased through the process of referencing various theories to get an initial picture of the phenomenon being studied and it is known as the process of triangulation from a theoretical point of view (Merriam 2009).

As soon as the researcher had identified the initial objectives of the study, the researcher needs to build instruments such as interview protocols and observation inventories as the main tools that will be used during data collection. To ensure the construction of a quality interview protocol, Castillo-Montoya,M. (2016) proposed an interview framework method known as Interview Protocol Refinement (IPR). Below is the table that explains the four main phases and the objectives involved:

Table: Interview Protocol Refinement (IPR) Framework Details

Phase	Details	Objective
1	Ensure that the interview questions match the research questions.	Build a matrix mapping interview question parallel to the research question.
2	Forming interview questions in an inquiry-based conversation.	Forming interview questions using 4W 1H.
3	Receive feedback from the interview protocol.	Checking the validity of interview questions.
4	Conducting pilot study	Ensure that research questions can be understood by the study participants.

Based on the above recommendations, the researcher had developed an interview protocol for an exploratory study of the digital technology competence of Islamic Education teachers. Among other things, in building this instrument, the researcher should define the context of the study as well as the operational definition of the main elements to be explored. This process helps the researchers and the evaluation experts to check and refer to the validity of the constructed question themes. Once again, the peer review/examination process takes place in this phase, and it is parallel with the recommendations in improving the credibility and consistency of qualitative studies (Merriam 2009). The table below is a detailed phase of designing the interview protocol according to the IPR 2016 framework.

Table: Examples of IPR 2016 Construction in the Digital Technology Competence study among Islamic Teacher.

No	Type of Questions	Definition of Context	Operational Definition	Interview Questions
1	Opening Questions	The participants' background	Self and family aspects	Can you tell a little bit about your background & family?
2	Preliminary Questions	Academic Background	From school to the university	Can you talk about your career journey as a teacher?
3	Transitional Questions	The beginning of involvement	The motivation to get involved	What motivates you to be directly involved in digital technology?
4	The Main Questions of the Study	Digital Competency	Knowledge Skills Attitude	Based on your own knowledge, what elements must be present in digital technology competence? (Can you describe the element?)
5	Closing Questions	The participants' hopes	The future of technology	According to you, what is your hope to improve digital technology competence among religious teachers.

Based on the table above, it can be concluded that in the construction of this interview protocol, there are several things that need to be given attention to, such as the question format which consists of five aspects, namely, opening questions, preliminary questions, transition questions, main questions and closing questions. The purpose of these questions being structured accordingly is to make them easier for the researcher to see the continuity of the narration of the phenomenon being studied.

After completing the construction process of the interview protocol, the researcher should obtain expert validation to ensure the consistency of the objectives and themes of the research questions (Kamarul Azmi 2012). This expert validation process is known as peer review/examination which is the involvement of supervisors or field experts in validating instruments to increase the credibility of the study (Bogdan & Biklen 2013). Some experts in the field of Islamic Education, qualitative, technology and language experts have been selected to validate the theme of the research question and comments will be gathered through the attached form given to them. The following is an example of the validity declaration form inventory given to the validity expert.

INVENTORY VALIDITY VERIFICATION DECLARATION FORM

Title: ▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮▮.

Name of Researcher: ▮▮▮▮▮▮▮▮
Tel: ▮▮▮▮▮▮/
Email: ▮▮▮▮▮

Reviews and suggestions

_____
_____
_____

Name	
Position	
Institution	
Date	
Signature & Official Stamp	

Diagram: An example of expert validity form

Next, based on the expert's feedback and comments, the researcher has made a summary to see the entire comments and it will be discussed with the supervisor. After the discussion, the researcher has improved the interview protocol in line with the recommendations given by the experts. This process involves review by supervisors and experts to ensure that the researcher can collect data accurately and enrich the findings through interviews with the study participants. The diagram below is an example of the summary made by the researcher.

No. Item	Interview Questions	Expert 1 ▬▬	Expert 2	Expert 3 ▬▬	Expert 4	Expert 5 ▬▬	Expert 6	Final Summary
		Comment	Comment	Comment	Comment	Comment	Comment	Comment
1	Can you share a little about: • Age • Place of origin • Place of assignment/school environment • Years of teaching • Educational level/specialization in teaching • Experience in teaching using digital technology • Experience attending digital technology courses/training.	Add: • Residential environment • Previous educational institution • Social media platforms owned	Agree	Agree	Include the experience of participating as a facilitator in digital technology seminars.	Agree	Agree	Expert (4) comment has been provided for question number 4.
2	What do the teacher understand about digital technology?	Agree	Agree	Agree	Agree	Agree	Agree	
3	Can you define the competency of technology digital?	Agree	Agree	It is recommended to ask this question first before inquiring about digital technology.	Agree	Agree	Agree	It has been refined

Diagram: An Example of final summary of the experts' comments in the interview protocol

Next, when the permission to conduct the study has been obtained from the supervisors and the authorities such as from the Education Policy Planning and Research Division (EPRD), the State Department of Education (JPN) and the school administrators involved, the researcher had conducted a pilot study to test the interview protocol. According to Merriam (2009), a pilot study was conducted to test the methodology, procedures, and instruments to improve the quality of the study in order to be more effective in the actual field. Therefore, this pilot study is very important in qualitative research so that the researcher can identify issues and challenges and test the usability of the interview protocol that had been set.

Next, the researcher had conducted a pilot study with study participants on 15 May 2022 in one of the middle zone schools in Peninsular Malaysia. The participants were selected for this study because they met the criteria that have been set; a technology expert teacher at the national level and possess a digital skills certificate. The selection of the right study participants can help the researcher obtain rich and detailed data (Creswell 1994). The pilot study process takes three days to be completed. Throughout the study, the researcher had found several issues and challenges that had to be overcome, and all pertaining information was recorded in the journal as a reference. This reflexive journal writing is one of the reliabilities in qualitative research (Saldana 2009; Lincon & Guba 1985).

During the pilot study, the researcher had identified initial problems that need to be resolved. The researcher had formulated two important aspects that deserve attention in the reflection of the pilot study, namely the interview protocol and the researcher himself. There were several elements that had been focused and discussed in the reflection as adapted and revised from Merriam 2001 & Fraenkel & Wallen 2003). The table below is a detailed checklist of the researcher's reflection while conducting the pilot study.

Table: Pilot study Checklist Table

Main Element	Criteria	Comment/ Recommendation
Interview Protocol	Level of Language	Need to use language that is easier to understand.
	Grammar	Free from grammatical error.
	Sentence Structure	Clear and understandable.
	Understanding the Questions	There are some questions that need to be improved to make them easier for the study participants.
	Repetition	There are several questions that have the same meaning; 4&5, 7&8, 10&11.
	Clarity of Questions	Participants are clear with the intent of the question.
	Meet the Objectives	Participants can answer the questions according to the set objectives.
The Researcher	Questioning skills	The researcher needs to improve the way of questioning by lowering the level of language according to the level of understanding of the study participants.
	Probing skills	The researcher needs to be more sensitive and efficient to understand the themes conveyed by the study participants. At the beginning, the researcher was a bit

		confused to utter the next questions according their priorities. The researcher should not limit the answers from the study participants according to the sequence but continue to ask according to the pace of the participants.
	Confidence	At first, the researcher was a bit hesitant to ask questions. Over the time, after getting a rhythm, the interview session went smoothly. The study participants cooperated a lot and made the researcher feel comfortable with the session. The researcher can link the rapport from the beginning of the meeting with the ongoing interview session.
	Time taken	This interview session took quite a long time which was three days to be completed. In short, the time taken to answer a research objective was about 4 to 5 hours. Therefore, the researcher should improve the way of questioning during the interview session.

From the pilot study conducted, the researcher was able to feel the real experience in conducting a qualitative study. Among the reflections observed were to improve the interview protocol, to increase self-confidence in conducting interview sessions, to improve questioning and probing skills, to estimate an appropriate time frame while in the actual field as well as self-preparation to be ready with alternative solutions should problems arise during the data collection process.

The greatest impact on the researcher was related to the comments and ideas from the study participants in improving the quality of the interview protocol. The ideas given were based on the participants' real experiences which had helped the researcher understand the study phenomenon closely. Among the improvements that have been made were combining repeated questions, giving more accurate phrases to digital technology terms and using easy-to-understand language. As a result, the interview protocol that had been improved allows the research findings to gain high validity and reliability.

Discussion
Qualitative validity and reliability, which is more accurately known as trustworthiness, deserves attention from qualitative researchers. The four aspects of trustworthiness, namely credibility, transferability, dependability and confirmability can help to explain the process of proving the findings of a study properly. Credibility and dependability issues are often disputed to validate the research findings. This is because every research finding needs to be proven with detailed and systematic documents support. For some researchers, this is quite difficult to do because the collection of this evidence is a complicated and lengthy process. Uniquely, trustworthiness is only applied in qualitative research which makes it more exclusive compared to other research approaches. In the qualitative approach, there is no consistent measuring tool, but with systematic documentation, the disputes that arise can be resolved and thus increasing the validity and reliability of the study.

As previously discussed, validity and reliability should be emphasized even during the pilot study. This is because, the construction of right instruments, namely the interview protocol and the observation inventory, will serve great impact on the discovery of the study's findings in the future. In addition, emphasis should also be given to the researcher as an individual to be more prepared to carry out the process of data collection and data analysis as the main source in qualitative research. This includes the preparation to source for literature from various sources to gain an initial understanding of the phenomenon to be studied. This is important in helping the researcher to collect preliminary and rich data in the pilot study which can improve the gaps in the actual study.

In order to achieve that goal, peer review process is very important in the construction phase of the interview protocol whereby it involves both supervisors and experts in the field to validate the theme of the interview protocol that had been set. The experts view can help the researcher to see the scope of the study from a broader and focused perspective. This helps the researcher conduct more efficient and clear interviews while in the field. In fact, it can be said that, in a qualitative study the researcher needs to be 'united' with the instrument during data collection process. This is because the researcher needs to conduct probing during the interviews to get comprehensive and in-depth data. To do so, the researcher must be rich with information and well aware of the phenomenon to be explored. Therefore, the expert's view on the interview protocol is very important to ensure the validity of the findings.

Reflexive journal writing can also help increasing the reliability of the data whereby the researcher records every event and reflective notes are made throughout the pilot study. Although this reflective writing is not emphasized in the pilot study, the researcher feels that it is very important and meaningful to make self-reflection for the purpose of improvement in the actual field.

Conclusion and Recommendation
Based on the discussion above, it can be concluded that qualitative research is a unique approach as it is more subjective according to the lens of an individual. However, there are guidelines from leading scholars in the qualitative field to make research findings more reliable and freer of doubt, comparable to quantitative studies which are more concrete. Therefore, the validity and reliability of qualitative studies measured through their credibility, reliability, transferability, and legitimacy need to be emphasized in the early stages of the study design up until the study reporting is completed. This includes the pilot study phase because the validity and reliability of qualitative research also occurs in the early stages of the study.

The implications of this article can be used as one of the contributions for beginner researchers to clearly understand the process of qualitative validity and reliability according to the views of leading scholars and get guidelines to conduct the pilot study. A clear understanding at an early stage related to the trustworthiness of conducting qualitative research can increase the credibility and consistency of qualitative research. Among the suggestions for further research is to analyse the form of validity and reliability in the real field which gives more meaning to the quality of qualitative research according to scholars' views. In addition, future researchers can explain in detail how to reduce biases in qualitative research.

Declaration of interest statement: The authors declare no conflict of interest.

References
Bogdan, R. & Biklen, S.K. (2003). Qualitative research in education: An introduction to theory and methods. Allyn & Bacon.
Bashir, M., Afzal, M. T., Azeem, M. (2008) Reliability and Validity of Qualitative and Operational Research Paradigm. *Pak.j.stat.oper.res. Vol.5(1) pp35-45*
Cohen, L., Manion, L., & Morrisson, K. (2000). Research Methods in Education (5th ed.) London: Routledge Falmer.
Corbin, J., & Strauss, A. (2008). Basics of qualitative research: Techniques and procedures for developing grounded theory. London: Sage
Creswell, J. W. (1997). Qualitative inquiry and research design: Choosing among five traditions. Thousand Oaks, CA: Sage.
Darussalam, G. & Hussin, S. (2016). Metodologi Penyelidikan dalam Pendidikan: Amalan dan Analisis Kajian. Kuala Lumpur. Universiti Malaya
Davies, D., & Dodd, J. (2002). Qualitative research and the question of rigor. *Qualitative Health research, 12*(2), 279-289.
Denzin, N. K. (1978). The research act: A theoretical introduction to sociological methods. New York: McGraw-Hill.
Denzin, N. K., & Lincoln, Y. S. (1998) (Eds). Collecting and interpreting qualitative materials. Thousand Oaks: Sage Publication.
Denzin, N. K., & Lincoln, Y. S. (2003). Collecting and interpreting qualitative materials. Newbury
Denzin, N. K., & Lincoln, Y. S. Eds.). (1998). *The landscape of qualitative research: Theories and issues.* Thousand Oaks: Sage Publications.
Fraenkel, J. R., & Wallen, N.E. 1996. How to Design and Evaluate Research. USA: Mc.Graw-Hill Inc.
Geertz, C. (1973). Thick description: Toward an interpretive theory of culture. In C. Geertz (Ed.), The interpretation of cultures: Selected essays (pp. 3–30). Basic Books.
Golafshani, N. (2003). Understanding reliability and validity in qualitative research. *The Qualitative Report, 8(4), 597-606. Retrieved [Insert date], from http://www.nova.edu/ssss/QR/QR8-4/golafshani.pdf*
Guba, E. G., & Lincoln, Y. S. (1989). Fourth a generation evaluation. Newbury Park: Sage.
Hammersley, M. (1992). What's wrong with ethnography? London: Routledge.
Jasmi, K. A. (2012) Kesahan Dan Kebolehpercayaan Dalam Kajian Kualitatif. Kursus Penyelidikan Kualitatif siri 1 2012 pada 28-29 Mac 2012 di Puteri Resort Melaka p. 1-33
Jasmi, Kamarul Azmi; Rozali, Mohd Hilmi (2021). Kesahan dalam Penyelidikan Kualitatif Pengajian Islam dan Pendidikan Islam Bengkel Reka Bentuk Penyelidikan Kualitatif dan Analisis Data. Siri 6. Pada 25 dan 26 September 2021, bertempat Dewan Maya di https://utm.webex.com/meet/qamar
Kvale, S. (1989). Issues of validity in qualitative research. Lund, Sweden: Chartwell Bratt.

Lebar, O. (2006). Penyelidikan kualitatif: Pengenalan kepada Teori dan Metod. Tanjung Malim, Malaysia: Penerbit Universiti Pendidikan Sultan Idris

Li, C.S. (2022). Interviewing in Qualitative. Research *Malaysian Journal of Qualitative Research Vol 8(1), May 2022 110-116   34-35*

Lincoln YS, Guba EG. Naturalistic inquiry. Beverly Hills, CA: Sage, 1985.

Lincoln, Y.S., & Guba, E.G. (1985). Naturalistic inquiry. Sage. https://doi.org/10.1016/0147-1767(85)90062-8

Mail, R., & Noordin, R. (2015). Penyelidikan Peringkat Sarjana Pendekatan Kualitatif sebagai Alternatif. Sabah. Universiti Malaysia Sabah

Maxwell, J. A. (1992). Understanding and validity in qualitative research. *Harvard Educational Review, 62*(3), 279-300

Merriam, S. B. (2001). Qualitative research and case study applications in education. San Francisco: Jossey-Bass Pub.

Merriam, S. B. (2009). Qualitative Research A Guide to Design and Implementation. San Francisco, CA: Jossey-Bass.

Merriam, S.B.& Tisdell, E.J. (2016). Qualitative Research A Guide to Design and Implementation. San Francisco, CA: Jossey-Bass.

Miles, M. B. & Huberman, A. M. (1994). Qualitative Data Analysis (Edisi ke-2). London: Sage.

Morrison, G.S. (2004). Early Childhood Education Today. New Jersey: Pearson Practice Hall.

Morse, J. M., Barrett, M., Mayan, M., Olson K. & Spiers, J. (2002) Verification Strategies for Establishing Reliability and Validity in Qualitative Research. *International Journal of Qualitative Methods 2002, 1(2).* 13-22

Noble, H. & Joanna Smith (2015) Issues of validity and reliability in qualitative research. *Evid Based Nurs.* Volume 18 (2)

Patton, M. Q. (2001). Qualitative research and evaluation methods (3rd ed.). London: Sage.

Seale, C. (1999). Quality in qualitative research. *Qualitative Inquiry, 5*(4), 465-478.

Silverman, D. (2005). Doing qualitative Research: A practical handbook. London: Sage

Stahl, N.A., & King, J. R. (2020). Expanding Approaches for Research: Understanding and Using Trustworthiness in Qualitative Research. *Journal of Developmental Education Volume 44 (1).* 26-28

Stenbacka, C. (2001). Qualitative research requires quality concepts of its own. *Management Decision, 39*(7), 551-555

Strauss, A., & Corbin, J. (1990). Basics of qualitative research: Grounded theory procedures and techniques. Newbury Park, CA: Sage Publications, Inc.

Wiersma, William. (1995). Research Methods in Education: An Introduction. 5th ed. Boston: Allyn & Bacon.

Yin, R. K. (1994). Discovering the future of the case study method in evaluation research. *Evaluation Practice, 15,* 283-290.

Zanaton Hj. Iksan, Salasiah Hanin Hamjah, Tengku Intan Zarina Tengku Puji & Mohd Noor Saper. (2016) Kualiti Ilmu Berasaskan Kesahan Dan Kebolehpercayaan Data Dalam Penyebaran Ilmu Islam: Perbincangan Berasaskan Kajian Kualitatif. *Jurnal Hadhari 8 (1).* 13-30 ejournals.ukm.my/jhadhari

Zeittey Karmilla Kaman, Zaleha Othman. 2016. Validity, Reliability and Triangulation in Case Study Method: An Experience *Proceedings of the 2nd UUM International Qualitative Research Conference 24-26 May 2016. Penang, Malaysia*