



Pilot Study, a Neglected Part of Qualitative and Quantitative Research Process: Evidence from Selected PhD Thesis and Dissertations

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Abstract: Conducting a pilot study is an important step in both qualitative and quantitative research process. Pilot study enable researchers to evaluate research methods and in particular research instruments with the aim of enhancing reliability and validity of data to be collected from the main study. Pilot study help researchers to detect flaws which lead to adequate and appropriate adjustments of the research instruments. Findings presented in this paper are drawn from an in-depth analysis using a documentary guide of randomly selected PhD thesis and dissertations from one public university in Kenya. The aim of this desk study was to examine ways in which PhD students/graduates use findings from pilot studies and in particular for purposes of improving the validity and reliability of research instruments. The study revealed that PhD students/graduates ignore pilot studies or give it minimal attention. Out of the seven students/graduates only 2 discussed pilot study in a stand-alone section, while others integrated it in the sub-sections of reliability and validity. Although two of the students/graduates mentioned the purpose of pilot study, they however, were not specific on the research instruments being piloted. Four of the students/graduates did not report how they analyzed data from the pilot study, while two indicated that they analyzed data but details on how it was done are missing. This study concludes that PhD students/graduates neglect or give general information about pilot studies in their thesis and dissertations. The students/graduates do not show how data analyzed from the pilot studies was used to revise, review or improve the research methodology and in particular research instruments. Findings from this study confirms that pilot study is a 'neglected part of the research process'. The study recommends that researchers especially post graduate students should be sensitized on the importance of taking pilot studies seriously. In addition, supervisors should provide effective and adequate guidance to their PhD and Masters students on how to conduct, and appropriately use findings from the pilot study.

Keywords: Pilot Study, Pre-Test, Qualitative, Quantative Research, PhD Dissertations, Thesis

1. Introduction

1.1. Definition of Term Pilot Study

Pilot study is an important step, road map or process in any qualitative and quantitative research paradigms. Different terminologies have been used to refer to pilot study. For instance, 'pre-study', 'pre-survey' 'pre-test version' 'preliminary trial research', 'trying out' or 'mini', 'small scale versions of research' or 'feasibility study' conducted

prior to the final, full-scale, larger, main or actual study [1-7]. From all these definitions, it is clear that a pilot study is a small investigation (using sample size of respondents) preceding a larger or the main study.

1.2. Rationale of Conducting a Pilot Study

The aim of pilot study is to practically assess research methods and procedures [8]. Pilot study is one of the procedures of collecting data that a researcher needs to master in order to improve and enhance reliability and

validity of data collected in the main study [9]. Van Teijlingen et al. [2] assert that a pilot study is designed to test the extent to which a study is worth pursuing, while noting changes requiring adjustments particularly with the research instruments. Thus, pilot study helps to detect any possible flaws or issues during the early stage of research project by identifying potential problems and areas which may require adjustments or changes especially with the research instruments and respondents before embarking on the actual research [4]. Thus, pilot study can greatly help reduce unanticipated or unforeseen problems in the research methods and in particular the research instruments usually informed by hypotheses, research questions and objectives.

Conducting pilot study gives a researcher an opportunity to redesign parts of the main study with the aim of overcoming challenges revealed or exposed during piloting. In support of this view, it is important to further point out that pilot study helps a researcher to identify unclear or ambiguous items on the content or wording of the research instruments, which if not revised, deleted or added it could affect the final outcome of the main study [10]. Findings from a pilot study give advance warning on where the research project may have failed, inform which research procedures could affect the outcome of the main study if not followed, and the extent to which the proposed methods are appropriate and easily understood by different respondents [2]. Based on the feedback of the pilot study, the researcher can confidently adjust, revise and refine research instruments before collecting data for the final study [6]. Thus, a researcher should take time to analyse data obtained from the pilot study in order to establish validity and reliability of research instruments in line with the research objectives, questions and hypothesis.

Any competent researcher should effectively and adequately plan for pilot study [2, 3, 6, 7]. In support of this idea, it was pointed out that a well-organized and managed pilot study has the potential of increasing quality of research since the results can be used to inform subsequent parts of the research process [7]. Further, by showing how relevant aspects of the main study changes proves and confirms the value of pilot study especially in qualitative research [6]. This assertion emphasizes the importance of carrying out pilot study while pointing out that it enables researchers make the necessary and key modifications regarding the respondents and research instruments before embarking on the main study.

Undertaking a pilot study facilitates testing of validity and reliability of data collected. A research instrument is considered a good measure when data collected is valid and reliable, and this can only be achieved by first undertaking a pilot study [4, 10]. Further, pilot study is meant to test feasibility of procedures and validity of methods and techniques [2, 3] used in collecting data. Reliability and validity of any research instrument is vital since it determines the results of the main research or study. Two authors, namely [2, 10] share similar sentiments while noting that if research instruments are not reliable and valid, then data for

the main study is likely to be void, flawed or inaccurate. This is likely to hinder novice researcher from obtaining rich, reliable and valid data (Gudmundsdottir and Brock-Utne) [7]. Similarly, data is considered reliable when there is consistency since concepts and ideas are supposed to be measured without any bias [11]. Further, opine that validity is when research can be trusted, while examining the extent to which research has been able to evaluate what it is required [12]. In addition, Welman and Krunge (1999) [10] noted that pilot study is more likely to help detect possible flaws in measurement procedures like instructions, administration and time limit. In this regard quality of research instrument becomes vital because conclusions of any findings are subjected to information obtained from reliable and valid research instruments.

Pilot study makes a researcher appreciate the intricate relationship between data collected and data analysed. Furthermore, pilot study allows the researcher to use participants for clarification in a timely manner, while being able to identify emerging and important topics, which enhances researcher's confidence. Thus, the process of collecting and analyzing data from a pilot study help boost confidence, expertise and training of novice qualitative researchers [8]. Similarly in undertaking pilot study, a researcher becomes more adept at using new tools or procedures [2]. Thus, use of pilot study in qualitative and quantitative research paradigms contributes to the overall credibility and objectivity of data for the main study. Available literature highly recommends use of pilot study before the actual or main study to ensure appropriateness of research instruments in collecting reliable and valid data, while tightening the feasibility of the main study in terms of time, costs, manageability and resources [2, 3]. Therefore, a PhD thesis or dissertation undertaken with the guidance of the pilot study enhances methodological rigor, ensures validity and reliability of data collected and effectiveness of the methodology used [6].

1.3. Challenges Facing Researchers Conducting Pilot Study

A researcher is likely to encounter a number of challenges while conducting a pilot study. There are two challenges a novice researcher is likely to encounter when conducting a pilot study; whether participants in a pilot study are to be included in the main study or completely different participants be recruited; and should data from pilot study be part of the results of the main study or be discarded [6]. Researchers are usually advised researchers to conduct the final study with different participants from those used during the pilot study, while noting the importance of both groups sharing same background (that is education, culture) depending on the aim or purpose of the study [6]. In addition, since pilot study is based on a smaller number of participants, it means reliability of findings from the pilot study may be limited, as compared to that of the main study (Van Teijlingen and Hundley. [6]. What this means is that participants in the pilot study should not be used in the main

study, since this may affect the final results or outcome.

On the question of whether data from pilot study should be included in the findings of the main study, or be discarded, the authors [6, 8] noted that this position is based on the argument that if the research instrument was not reliable or valid, then combining data from pilot and main study may lead to invalidity of data in the entire research process. In supporting the position of not including pilot data in the findings of the main study, [8] argues that such inclusion is likely to contaminate data that would have been collected from an improved or revised research instrument. Further observations reveal and affirms the view that it is appropriate to avoid including data from pilot study into the main study [6, 8].

Completing a pilot study successfully is not a guarantee of successful full-scale survey [2]. Although pilot study findings may offer an indication of the likely response rate for the main study, it might fail to guarantee this because such findings may lack statistical foundation and are based on a smaller sample [2]. Furthermore, sample size in a pilot study is usually too small to generate valid and reliable data for a large or main quantitative and qualitative analyses [8]. Therefore, novice researchers are advised not to combine data from the pilot study with that of the main or final study.

2. Literature Review on Pilot Study in Qualitative and Quantative Research Paradigms

In 2020 a pilot study on factors related to learners' satisfaction in blended learning English proficiency courses was done with the aim of determining the validity and reliability of a semi-structured interview schedule [9]. There were three stages in the interviewing process; pre-interview, actual interview and post-interview. The researcher identified participants, date, time, venue and prepared interview schedule in line with the study objectives. During the interview process, the researcher organized seating arrangement, briefed participants on nature, purpose of research, length of the session, need to record data and closure of the interview session. To ensure confidentiality and voluntary of the interviewees, participants were requested to complete a 'consent form'. In the post interview stage, data collected was transcribed verbatim, coded and organized into themes as per the research objectives. After the pilot study, the interview questions were refined, rephrased and modified to guide the researcher in the main study. More questions were added, from three to six to facilitate the process of collecting rich information/data. Other changes made in the interview schedule included checking on language, fine-tuning the items with the aim of making them explicit and clear to the study participants. Lastly, the researcher did revise the instructions before the actual collecting of data using the interview schedule to ensure participants understood well the interview procedures.

In another study, researcher investigated quality issues

related to pilot studies in qualitative research from two universities in Sweden and Ireland [7]. The researchers worked in partnership with academic colleagues from United Kingdom and Ireland in designing a comparative study of inclusive education in Sweden and Ireland. To ensure trustworthiness and utility of research instruments; interview schedule, meta-discussion and video recording before the main study, the researchers conducted a pilot study. After the pilot study, researchers found it necessary to check on grammar while adding more relevant questions in the interview schedules to cover students' health units, their composition and work within the schools. As a result of an elaborated pilot study, researchers were able to modify data collection instruments and study design. Pilot study is a valuable part of the main study since issues related to effectiveness of research instruments are easily identified and on time [7]. The modifications and understanding of the research instruments may not have been well achieved without detailed attention to the pilot study. Therefore, pilot study makes planning of the main study more efficient and effective.

In their phenomenological qualitative study based on a reflection of lessons learned from pilot study of a PhD thesis that explored perceptions of online tutors on Student-Centred Learning (SCL) in Higher Education institutions in Egypt, [6] collected data using 5 out of 20 online tutors with focus groups and semi-structured interviews. All the interviews and focus groups were video recorded. Informed consent form covering confidentiality and the right to withdraw was filled by the study participants. Data was analyzed using a Facial Analysis Coding System (FACS). After pilot study, a number of questions in semi structured and focus group interviews were either added, merged, deleted, replaced or reworded. Consequently, the researcher was able to gain the necessary skills on how to deal with such issues as; avoiding bias in research, questions with no answers, overriding men participants in focus groups, audio and video recording of female interviewees, while being careful about classroom setting as a space for conducting interviews. In conducting the pilot study, a number of professional, social, ethical and cultural issues and perspectives, were identified, in addition to viewing how participants interacted with the study design and research questions. The pilot study helped the researcher reduce risk of errors or problems, identify and resolve potential problems or issues. Specifically, pilot study made it possible for the researcher to first draw a clear road map for the study including data collection tools, analysis and theoretical framework. Secondly, the researcher learnt how to achieve goals and objectives using a variety of "thinking hats" during process of data collection. Finally, a novice qualitative researcher needs to know that a pilot study is meant to sharpen their flexibility and reflexivity skills, in addition to being empowered on how to deal with any ethical dilemmas.

In a study that examined 35 PhD thesis and dissertations of students in Philippines University, Mocerro, R. E. [10] aimed at establishing how often graduate students use and discuss results of pilot studies in the main research projects. Mocerro

used summative content analysis which involved counting and comparing keywords or content followed by interpretation. Findings revealed that out of 35 researchers, 12 used pilot study but only 4 included complete discussion of the results from the pilot study. Among the four, only one researcher used the results to improve the research instruments by revising or removing poorly worded items in the questionnaire. However, 23% of the sampled respondents partially discussed findings of pilot study. Despite the importance attached to pilot study, that of establishing validity and reliability of research instruments, very few of the respondents discussed the results of the pilot study. This leaves the reader with doubts on validity and reliability of research instruments used in 35 PhD dissertations, since this can only be established by analysing and factoring in the results of a pilot study. The fact that Moco-ro's study was done in Philippines presents knowledge and research gaps, which the current study addressed, that of conducting a similar desk top analysis of PhD dissertations and thesis in Kenya.

In a study done in Malaysia which entailed developing job satisfaction instruments, a pilot interview with two offshore catering employees was done in preparation for collecting data for PhD dissertation [5]. The study explained the steps carried out that helped the researcher to obtain the necessary and relevant information in order to improve the process of collecting data for the main study. Each step assisted the researcher to develop an appropriate interview guide for the main study. The interview schedule was guided by open-ended questions covering issues related to motivation, job experiences and satisfaction. The interview guide was emailed to experts for review. The supervisory committee members reviewed questions in the interview schedule based on language, wording and relevance. At this point, some questions were modified. Following the initial reviews, seven central questions were tested in the pilot work while probing questions were used to explore further issues in the study. In piloting interview schedules, the author [5] suggests that participants should share similar criteria or characteristics with the participants in the actual study. Digital recorder was used to record the interviews. Time taken to interview ranged between 32 and 37 minutes. The aim of the pilot study was to test the appropriateness of the interview items and provide the researcher with suggestions regarding the viability of the research instrument. Pilot study made the researcher obtain experiences on how to use in-depth, semi-structured interviews, while building rapport with the participants. In addition, the pilot study assisted the researcher in mastering interview skills and flow of conversation. After the pilot study, the researcher had the opportunity to transcribe verbatim, manage and code data. The lessons learnt from transcribing and managing the data enabled the researcher to gain knowledge and skills on how to summarize the transcripts, while identifying codes for the main study. Findings from the pilot study did assist the researcher to refine strategies, rephrase and sequentially align them with some questions. The interview framework was revisited,

while additional three central questions were added with the aim of allowing quality data and deeper responses from the participants. For purposes of the main study, ten open-ended questions were added to increase validity of the interview questions to help understand participants lived experiences.

In a pilot study based on the integration of Indigenous Technology in teaching and learning in a school located in semi-rural Winterveldt, North of Pretoria, South Africa, [3] sampled five technology teachers (four males and one female) teaching Grades 7, 8, 9 and 10. Technology learners (five boys and five girls) were targeted for interviews, lessons that integrated Indigenous Technology were observed and documents analysed. Using data analyzed from pilot study, the researcher was able to revise observation schedule by specifying the situation, layout and school facilities, technological symbols, pictures, artifacts and indicators of indigenous technologies, school timetables, culture, interaction among teachers, teachers and learners, teaching and learning activities in Grade 7 classes [3]. With the teachers' interview schedule, the researcher added free-attitude items to increase teachers' participation through probing techniques, for instance "What do you mean?", "Tell me more", "Clarify" and using silence as an effective technique of getting more information. In addition, researcher incorporated biography of teachers during plenary meetings. Plenary meetings were reduced to three by combining third and fourth meetings on lesson planning [3]. The lesson was expanded to include four instead of one activity. Document evaluation meeting was replaced with a document evaluation sheet to help scrutinize the documents adequately and efficiently.

In a pilot study for a PhD dissertation which aimed at enhancing objectivity, validity and reliability of the research instruments, [13] used one campus in a public university in Kenya different from the one was used for the main study. In line with Turner (2010) [5] sentiments that participants in a pilot study should share similar criteria or characteristics with the participants in the main study, [13] choose the public university because it had similar characteristics with the one used during the main study in terms of campuses/colleges, geographical locations and diversity of degree programmes. The pilot study enables the researcher to determine the extent to which the research instruments would provide the anticipated data [14, 15], increase their practicability while redefining research skills. After the pilot study, relevant adjustments, review and modifications were made to the interview and Focused Group Discussions (FGD) schedules. In particular, the overall design was revised and edited since sections and layout were mixed up. Accordingly, in designing an interview guide, a researcher is required to translate study objectives into questions that make up the main body of the interview schedule [16]. This did help the researcher to generate the main themes of the interview schedule from the study objectives, while grouping together specific issues, key themes and sub-themes thus making the interview schedule shorter and more focused.

Further, it was observed that data from the pilot study

showed that specific items in the interview guide and FGDs were repetitive, confusing, ambiguous, mixed up in different sections, sometimes contradictory, and not specific to issues under investigation [13]. Thus, in revising the interview schedule, some items were accepted without change, while others were modified with changes such as rewording, shortening and clarification. New items were added, while others were discarded, depending on a number of factors (for instance, too easy, difficult or not relevant at all). However, above all, the researcher made sure that the revised items fitted well into the study objectives. In framing of the interview items, the author [13] reflected more on qualitative characteristics of the interview schedule in terms of details, elaboration and clarity of issues under investigation. Most qualitative interview schedules follow a pattern of main questions and probes [17]. Similarly, in another study the interview schedule patterns guided in revising the interview guide, while allowing for flexibility and exploratory nature of the interviewing process. In addition to pilot study, the research instruments were carefully checked by research experts to further ensure clarity, relevance and validity before embarking on collecting data for the main study [13]. Research has further pointed out that findings from a pilot study should not be included in the main study because they are based on a small sample, thus they may lack statistical foundation and cannot be generalized [2]. Therefore, since the pilot study [13] was done in a university campus different from the one used for the main study, data collected during the pilot study was not included in the main study.

From the literature review it is important to note that despite the importance and usefulness attached to pilot study, a number of scholars, namely [18], Whithely and Whithely (2005) [3] pointed out that most researchers ignore pilot studies, giving it minimal attention, while others do not report anything about pilot study. It is no wonder, researchers refer to pilot study as a 'neglected part of the research process' [7]. Further findings have shown that pilot studies attract limited attention in literature, with few publications drawn from empirical findings related to pilot studies [1]. A number of researchers claim that they make necessary changes, but do so without sharing details on what exactly was learnt from the pilot study [2, 6]. Some thesis and dissertations refer to only one element of the pilot study, for example, 'pre-testing' or 'pilot testing' of a questionnaire (De Vaus, 1993 [2] while others simply state: "the questionnaire was tested for validity and reliability," with minimal details on what was learnt [2], from the pilot study.

3. Purpose of the Study

The knowledge gaps identified in literature review did inform the researchers on the need to undertake the desk study with the aim of ways in which PhD students/graduates use the findings of pilot study. The desk study was guided by the following specific objectives:

1. Examine whether PhD students/graduates state the purpose of pilot study

2. Identify ways in which PhD students/graduates use research findings and experiences of pilot study

4. Research Methodology

The researcher randomly selected seven PhD dissertations and thesis from one Faculty in one public university in Kenya. Using a simple documentary analysis guide, the researcher reviewed seven PhD dissertations and thesis using the following categories: purpose of pilot study; instruments piloted; whether the results of pilot study were analyzed and used to revise and refine research instruments; other ways the findings from pilot study were used by post graduates. Content analysis was used to analyze data collected through documentary analysis guide. Analyzed data is presented and discussed thematically in line with the two research objectives.

5. Presentation and Discussion of Findings on Pilot Study in PhD Dissertations and Thesis

5.1. Demographic Information

In this section 5.1 data on gender of PhD students/graduates, types/nature, research designs and paradigms in the PhD thesis and dissertations will be presented.

5.1.1. Gender of PhD Graduates

Gender of PhD graduates is presented in Table 1.

Table 1. Gender of PhD Graduates.

Gender	Male	Female
PhD graduates	3	4

Information from Table 1 shows that out of the 7 PhD students/graduates, there were more (4) females as compared to (4) males.

5.1.2. Types and Nature of Thesis and Dissertations

Data on the type and nature of thesis and dissertations is presented in Table 2.

Table 2. PhD Thesis and Dissertations.

Type of Thesis	Number
Course work/Thesis	3
Thesis/dissertation only	4
Total	7

Findings from Table 2 reveal that majority (4 out of 7) of the PhD students/graduates did their studies by thesis and dissertation as compared to 3 who did their studies by course work and thesis. It seems that PhD students prefer doing their studies by thesis and dissertation.

5.1.3. Research Designs in PhD Dissertations and Thesis

Results on the type of research designs in the PhD thesis and dissertations is shown in Table 3.

Table 3. Types of Research Designs.

Type of Research Designs	Number
Evaluation Research Model	1
Correlational and Mixed Methods Design	1
Correlation Research Design	2
Descriptive Survey Design	2
Correlational and Comparative Research Designs	1
Total	7

Regarding the type of research designs used by PhD students, findings from Table 3 reveal that correlation research designs (2 students) and descriptive survey design (2 students) are more popular among the students as compared to evaluation, correlational and comparative designs. All the seven PhD students/graduates combined both qualitative and quantitative research paradigms in their thesis and dissertations.

5.2. Purpose and Relevance of Pilot Study in Thesis and Dissertation

In this section, first data on the position, purpose and relevance, reliability, validity and language used in the pilot study, whether it was clear the research instruments being piloted and the extent to which data collected was analysed is presented and discussed. The first section covers position of pilot study in the thesis and dissertations as shown in Table 4.

Table 4. Position of Pilot Study in Thesis and Dissertations.

Position/section in the dissertations/theses	Number
Stand alone	2
Reliability	2
Validity	3
Total	7

Findings in Table 4 shows that out of the seven PhD students/graduates, only 2 discussed pilot study in a stand-alone section, while the other 5 graduates integrated it with the sub-sections of reliability and validity. This shows that coverage of pilot study is given minimal attention. These findings concur with what [18], Whithely and Whithely (2005) [3] pointed out that most researchers ignore pilot studies while others do not report. This further confirms what [7] refers to pilot study as a ‘neglected part of the research process.’ Majority of the researchers fail to give pilot study the seriousness it deserves, yet it is key to any meaningful empirical research since it enhances validity and reliability of data for the main study.

On the extent to which the purpose and relevance of pilot study is mentioned in the PhD dissertations and thesis, out of the seven dissertations and thesis, only two PhD students/graduates mentioned or presented the relevance of and purpose of pilot study. The purpose of pilot study is reported differently by five of the PhD graduates.

First on validity, reliability and language use, findings by PhD students 2 and 3 concur with [2] who reported that some of the thesis and dissertations refer to only one element of the pilot study, “the questionnaire was tested for validity and reliability,” with minimal and scanty details on how this

informed reliability and validity of other research instruments used in the research apart from the questionnaires. This is evidenced by the following extracts:

‘.... enable assessment of validity of questions, reliability of data collected, appropriateness of language used and contextualization the items for predictability...’ (PhD Graduate 2)

‘....in order to check for both validity and reliability of the study, testing of the research instruments was done on pilot sample picked from the target population...’ (PhD Graduate 3)

...for further establishment of content validity, all the research instruments were pilot tested to establish whether each of the items would generate the required information. The researcher checked whether the instruction were comprehensive and correctly worded, as well as checking the statistical an analytical process, in particular whether the reliability and validity of results would serve their purpose in order to produce the intended aim.... (PhD Graduate 6)

However, PhD students/graduates 2 and 6 further emphasis on the importance of checking language use and the extent to which statements and sentences in the research instruments are correctly worded and written. Similarly, research findings show the importance of the supervisory committee members to review interview questions based on language, wording and relevance [5].

Secondly, on clarity and ease of understanding by the respondents it is clear that pilot study should aim at helping a researcher identify unclear or ambiguous items in terms of content or wording of the research instruments [9, 10]. This is likely to make it easy for the respondents to understand what the researcher is asking, which further strengthens data for the main study. The following sentiments supports the views of [9, 10]:

‘...piloting was conducted to make sure that research instruments used are clear and can be understandable to the respondents of the study...’ (PhD Graduate 4)

‘...first, the researcher carried out a pilot study to pre-test to determine clarity of items....this was done be administering research instruments in two schools that were selected randomly. The sample consisted of 2 head teachers, 8 teachers and 12 pupils....’(PhD Graduate 5)

Third, on the clarity of the research instruments being piloted, a number of scholars have noted the need to be specific on which research instruments they plan to pilot before collecting data for the main study. For instance, it has clearly been noted that piloted interview guide, observation, documentary analysis guides and meta-discussion [2, 5]. Findings from the current desk study shows that out of the seven PhD students/graduates, one cannot easily and confidently conclude the research instruments used as evidenced from the following extracts:

‘...pilot study was conducted in 10 randomly selected pre-schools...’ (PhD Graduate 2).

‘...the instruments were piloted in twenty (20) primary schools within the county to ensure that the questions and

instructions were understood....' (PhD Graduate 3).

'...the pilot study of the research instrument was carried out in one of public boarding secondary school, which was not sampled in the study. The pilot study was also conducted to 24 students that were given questionnaires and document analysis review that was given to 2 school head teachers and one district education officer in order to find out the ambiguous items in the research instrument like grammatical error and any other unclear item...' (PhD Graduate 4).

'...the piloting was conducted in four pre-schools of the thirty-seven pre-schools...' (PhD Graduate 6).

What is clear from all these extracts is where the pilot study was done, but information on the research instruments piloted is missing, yet PhD students/graduate 3, 4 and 6 used documentary analysis and observation guide, key informant interview schedules and questionnaires. However, PhD graduate 7 was more specific on the research instruments being piloted as is evidenced by the following extracts: *'...piloting for documentary analysis guide, questionnaire and observation schedule was carried out in 5 public primary schools which were not included in the main study....'* There is need to always clearly point out on the research instruments used during the pilot study as reported [3, 5, 7].

Lastly on the issue of data analysis, the author [6] advises researchers to take time to analyze data from the pilot study since these findings give direction on how to revise research instruments with the aim of establishing validity and reliability in line with research objectives, questions and hypothesis. Despite the importance attached to pilot study, [10] noted that few dissertations and thesis use research findings as a guide to revise research instruments. Mocoero's findings concur with the findings of this current research. For instance, out of the seven PhD students/ graduates, four did not report on how and whether they analyzed data from pilot, while two indicated that they analyzed data but did not give details of how this was done. However, PhD students/graduate 7 presented a rather detailed account as shown in the following extracts:

'...After all the questionnaires were filled up, the researcher collected them and analysis was done systematically. After screening filled up questionnaires to make sure that all questions were answered, the researcher used content analysis strategy to analyze what was observed, extracted from document and from open ended questions. Closed ended questions were coded and numbers assigned to the responses. The same exercise was repeated after a week and the results from the two pilot studies were correlated by use of Pearson product moment correlation coefficients which yielded 0.78 correlation coefficient of reliability which meant that the two result were highly associated (PhD Graduate 7).

5.3. Ways in Which PhD Graduates Use Findings from the Pilot Study

This desk study examined ways in which PhD graduates use findings from the pilot study. The findings are presented and discussed in section 5.3.

5.3.1. Review and Revise Research Instruments

Although their statements are not clear and lack a detailed account of the research instruments being piloted, evidence shows that five out of the seven PhD graduates attempted to review and revise some of the research instruments after pilot study. This is evidenced by the following extracts:

'...Piloting helped to govern the reliability of the data collection research instruments. Significant ideas, errors and improvements from the piloting exercise was integrated in the instruments...' (PhD Graduate 1)

'...Feedback from the pilot study was discussed with supervisor and appropriate adjustments made on the items by integrating open ended items to the questionnaire which presented an opportunity to confirm responses from preschool teachers. Indicators of value education and sub-dimensions of social studies curriculum were reduced from five to three to make the study manageable...'. (PhD Graduate 2).

'...This exercise enhanced the usability of the instruments as it clarified items before deployment to the target respondents...' (PhD Graduate 3).

'...Test items for the Mathematical Concepts Competences Acquisition Test (MCCAT) that were not adequate in terms of generating the required information were removed, which were 3-tier addition and subtraction sums, any numeral or figure that had a value greater than 10 in any sum as well as reverse sequence pattern sums and items. The items that were suggested for improvement were adopted to generate additional information. The items that were revised included those which exceeded a sum total of 10 when added altogether as well as those which exceeded a sum total of 10 in calculations requiring subtraction...' (PhD Graduate 6)

However, from these statements and extracts it is not clear which research instruments were being piloted, instead the graduates present general information. Further, it is also not clear the extent to which graduates used the findings to improve research instruments used to collect data for the main study. This is in contrast to the observations [6] who noted that novice researchers are required to adjust, revise and refine research instruments before collecting data for the main and final study based on the findings from the pilot studies. Similarly, researchers are usually advised that after a pilot study, research instruments such as interviews and questionnaires should be refined, rephrased and modified for use in collecting data for the main study, with the aim of enhancing reliability and validity of data to be collected [3, 13]. From this desk study, there is evidence to show that to a large extent PhD graduates ignored findings of the pilot study when revising the research instruments.

5.3.2. Address Research Design and Sampling Techniques

Findings drawn from content analysis of the seven PhD thesis and dissertation shows that none of the PhD graduates used results from the pilot study to revise, address research design, sampling techniques and procedures. Yet scholars have modified the research design and to some extent sample

size and sampling procedures after the pilot study [7, 13]. For instance, before the pilot study [13] had planned to use descriptive research design, but after the pilot study, cross-sectional design was found to be more relevant and useful for the main study.

5.3.3. Improve Research Skills

All the seven PhD students/ graduates did not seem to have used results from the pilot study to improve or refine their research skills. Yet pilot study is meant to help novice researchers to master and sharpen their research skills, flow of conversation, in addition to boosting their confidence and expertise [5, 8, 13].

6. Conclusions and Recommendations

Findings from the current desk study confirms that pilot study is a '*neglected part of the research process*' because majority of the PhD students/graduates gave it minimal attention. For instance, out of the seven students/graduates sampled in this study, only 2 discussed it in a stand-alone section, while the other 5 students/graduates integrated it under sub-sections of reliability and validity. In addition, only two PhD students/ graduates mentioned the purpose of undertaking the pilot study in their dissertations and thesis to check validity, reliability, language use, clarity and ease of respondents understanding and the specific research instruments being piloted. Out of the seven PhD students/graduates four did not report how they analyzed data from the pilot study, while two indicated that they analyzed data but did not give details of how this was done. Generalized and scattered information is given in regard to how data analyzed guided in revising and reviewing of research instruments, in addition to improving and changing of research design, sampling procedures and skills.

The researchers recommend the need for supervisors to take time to guide their PhD students to ensure pilot studies are not just carried out as a procedure but should be used to inform all research procedures and specifically research instruments to ensure reliability and validity of the data collected in the main study. From the reviewed literature, there is evidence to show that undertaking pilot study is important because it helps researchers to detect possible flaws or issues during the early stage of a research by identifying potential problems likely to compromise data for the main study. Thus, conducting a pilot study help to reduce any unanticipated or unforeseen problems in the research design and particularly with the research instruments in order to avoid collecting flawed data.

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